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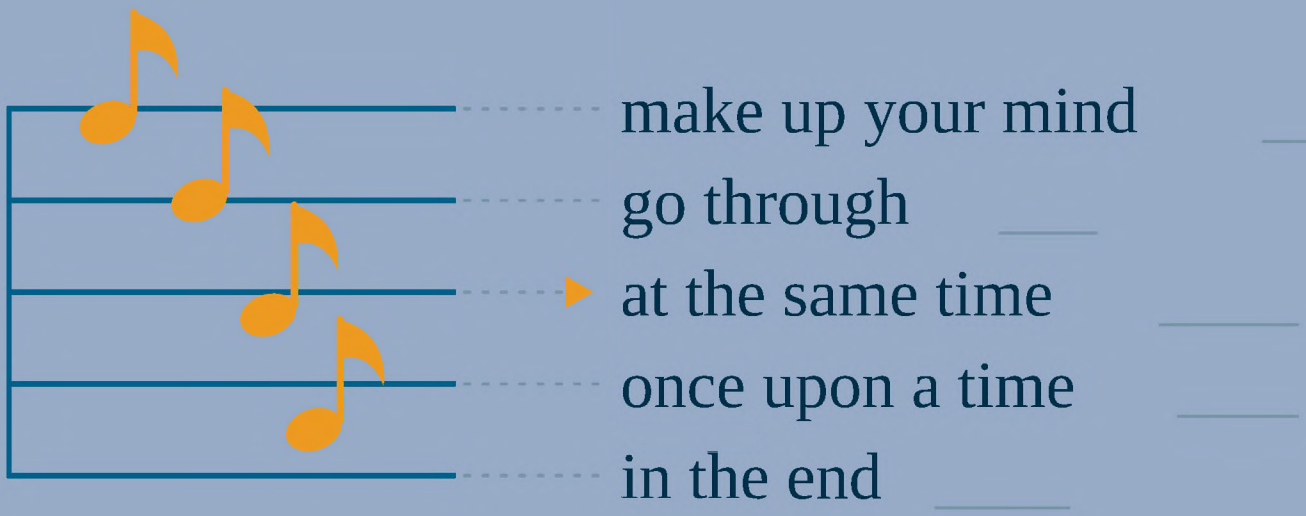
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Concert of Learning

Short-Term Vocal Training with Selected Pop Songs for Multi-Word Unit Learning in Early English as a Foreign Language Context



Antonio Vivone

λογος

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ABSTRACT

This dissertation investigates the impact of a music-based approach—specifically, vocal training with English pop songs—on multi-word units (MWUs) learning in lower secondary English as a Foreign Language (EFL) classroom. In addition to evaluating MWU gains, the study explores the effects of this approach on the well-being of learners and the role of involuntary musical imagery (INMI) as a potential mechanism supporting MWUs learning.

A quasi-experimental, two-phase intervention was implemented across four schools with approximately 250 students, comparing a test group receiving structured vocal training with pop songs to a control group exposed to spoken versions of the same songs. Data collection included pre-, post-, and delayed post-tests assessing both receptive and productive MWU knowledge, along with questionnaires on well-being and INMI. MANCOVA and ANCOVA analyses were conducted to assess the effects of the intervention while controlling for variables such as prior English MWU knowledge, gender, first language/bilingualism, musical training, and extracurricular exposure to English and to pop songs.

Findings indicate that while both groups improved in MWU knowledge, the music-based approach yielded moderate-to-large within-group gains, especially for receptive knowledge, though between-group differences were not statistically significant. Prior MWU knowledge was the strongest predictor of learning outcomes. The intervention significantly enhanced participants' well-being during the treatment phase, which was positively associated with MWU gains but declined after the intervention. INMI occurred more frequently in the test group and supported MWU retention, though its effects were not sufficient to yield significant group-level differences, highlighting the need for sustained exposure to maximize long-term impact.

This study advances music-based vocabulary learning by introducing a pedagogically structured and curriculum-aligned intervention that incorporates vocal training with authentic pop songs. It contributes methodological innovations through the development of a validated MWU corpus, a multidimensional assessment tool, and a set of classroom-ready teaching resources. Additionally, it offers theoretical insight into implicit learning by highlighting the pedagogical potential of INMI as a rehearsal mechanism and underscoring the importance of integrating music to support cognitive and affective engagement in early EFL instruction.

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TABLE OF CONTENTS

LIST OF TABLES xi
LIST OF FIGURES xiii
LIST OF ABBREVIATIONS xvii
CHAPTER 1: INTRODUCTION 1
CHAPTER 2: THEORETICAL AND EMPIRICAL FOUNDATIONS 9
2.1 Core Constructs and Conceptual Foundations 11
2.1.1 Vocabulary Knowledge and Assessment 11
2.1.2 Vocal Training 25
2.1.3 Well-Being 28
2.1.4 Involuntary Musical Imagery 30
2.1.5 Neuroscientific and Cognitive Foundations of Music-Based Vocabulary Learning 32
2.1.5.1 Neural Foundations of Vocabulary Learning 32
2.1.5.2 Neural Foundations of the Musician Advantage 35
2.1.5.3 Neural Overlap Between Music and Language Processing 37
2.1.5.4 Cognitive Perspectives on Music-Based Vocabulary Learning 42
2.1.6 Learner Differences and Exposure Variables in Multi-Word Units Learning 45
2.2 Pedagogical Perspectives on Music-Based Learning 54
2.2.1 Songs in English as a Foreign Language Education 55
2.2.2 Authentic Pop Songs in English as a Foreign Language Education 58
2.3 Empirical Studies on Music-Based Vocabulary Learning 60
2.3.1 Empirical Studies on Music-Based Approaches in First Language Vocabulary Learning 61
2.3.2 Empirical Studies on Music-Based Approaches in Second and Foreign Language Vocabulary Learning 63
2.4 Addressing the Research Gap: Rationale and Challenges 84
CHAPTER 3: METHODOLOGY 89
3.1 Research Design 89
3.2 Participants 90
3.3 Procedure 92
3.3.1 Instructional Phases and Lesson Plan 99
3.3.1.1 Warm-up Phase 108
3.3.1.2 Presentation Phase 109
3.3.1.3 Reproductive Phase 111
3.3.1.4 Application Phase and Production Phase 114
3.3.1.5 Consolidation Phase 116
3.4 Materials 117
3.4.1 Corpus 117
3.4.2 Multi-Word Units 128
3.5 Instruments 133

3.5.1 Pre-Intervention Questionnaire 135
3.5.2 Post-Intervention Questionnaire 136
3.5.3 Vocabulary Test 138
3.5.4 Scoring Rubric 140
3.6 Validation of the Materials, Worksheets, and Instruments 143
CHAPTER 4: FIRST STUDY 147
4.1 Sample Characteristics 148
4.1.1 Data Collection 148
4.1.2 T0 (Pre-Test) and T1 (Post-Test) Data 151
4.1.3 Descriptive Statistics of the Continuous Variables 153
4.2 Results 156
4.2.1 Paired t-Test: The General Effect of the Intervention 156
4.2.2 ANCOVA 157
4.2.3 Power Analysis 162
4.3 Discussion of First Study's Results 163
4.4 Additional Insights from the First Study 167
4.4.1 Self-Perception of the Pupils during the Intervention 168
4.4.2 Involuntary Musical Imagery 169
4.4.3 Perceived Music Benefits Pre- and Post-Intervention 170
4.4.4 Student Learning Perception 171
4.5 First Study: Limitations, Qualitative Insights, Documentation, and Self-Reflection 172
4.5.1 Limitations of the Lesson Planning 175
4.5.2 Implications Following the First Study 176
4.6 Summary and Conclusion 176
CHAPTER 5: SECOND STUDY 179
5.1 Sample Characteristics 180
5.1.1 Descriptive Statistics 181
5.1.2 Cross-Tabulation Analysis 185
5.1.2.1 Gender Distribution 185
5.1.2.2 Bilingualism Distribution 186
5.1.2.3 First Language/Bilingualism Across Gender 187
5.1.3 Descriptive Statistics of the Continuous Variables 188
5.1.4 Summary and Conclusion 204
5.2 Preprocessing and Preliminary Analysis of Variables 205
5.2.1 Logit Transformation for Bounded Data: Addressing Skewness and Boundary Effects 205
5.2.2 Normality Test of the Dependent Variables: T0, T1, and T2 206
5.2.3 The Association Chi-Square Test Between T0, T1, T2, and the Group 214
5.3 Statistical Methodology for the Second Study: Rationale for MANCOVA 216
5.4 Results and Analyses 217

5.4.1 Statistical Analyses of the Effect of Vocal Training with Pop Songs on Multi-Word Unit Learning in English as Foreign Language Compared to a Non-Music-Based Approach 217
5.4.1.1 Between-Subjects Comparisons....218
5.4.1.2 Descriptive Statistics....219
5.4.1.3 Between-Subjects Effects Analysis 221
5.4.1.4 Calculation of Effect Sizes for Test and Control Groups 226
5.4.1.5 Multivariate Test Results 229
5.4.1.6 Contrast Results (K Matrix)....230
5.4.1.7 Statistical Analysis of Secondary Predictors 231
5.4.1.8 The Role of Secondary Predictor Variables in Vocabulary Acquisition: Statistical Insights from t-Tests and Correlation Analysis....238
5.4.1.9 Answer to RQ1 239
5.4.2 Statistical Analyses of Research Question 2: The Role of Well-Being in Enhancing Multi-Word Unit Learning....246
5.4.2.1 Between-Subjects Effects Analysis 247
5.4.2.2 Multivariate Test Results 255
5.4.2.3 Contrast Results (K Matrix)....256
5.4.2.4 Answer to Research Question 2 258
5.4.3 Statistical Analyses of Research Question 3: The Influence of Involuntary Musical Imagery on Multi-Word Unit Learning 262
5.4.3.1 Between-Subjects Effects Analysis 264
5.4.3.2 Multivariate Test Results 270
5.4.3.3 Contrast Results (K Matrix)....271
5.4.3.4 Estimated Marginal Means for Level 1 and Level 2....273
5.4.3.5 Answer to Research Question 3 275
5.4.4 General Discussion of Research Question 1, Research Question 2, and Research Question 3 282
CHAPTER 6: FINAL EVALUATION AND FUTURE PERSPECTIVES....291
6.1 Comparative Analysis of the First and Second Studies 292
6.1.1 Methodological Refinements and Statistical Adjustments 293
6.1.2 Comparative Findings on Multi-Word Unit Learning: Effectiveness and Retention 295
6.1.3 Occurrences of Well-Being and Involuntary Musical Imagery....300
6.1.4 The Predictive Role of Prior Knowledge and Learner Perceptions in Multi-Word Unit Learning....305
6.1.5 Summary and Implications 308
6.2 Overview of Key Contributions: Advancements in Research, Theory, and Pedagogy....309
6.3 Limitations of the Research 312
6.4 Future Research 320
6.5 Conclusions....322
REFERENCES 325

APPENDICES 435
Appendix A. Linguistic Analysis of Pop Song Lyrics 435
Appendix B. Musical Analysis of Pop Song Lyrics 451
Appendix C. Word Types, Headwords, and Frequencies of the Corpus 480
Appendix D. Categorization of Words in the Corpus 493
Appendix E. Distribution of Parts of Speech Across Different Count Ranges 540
Appendix F. Country of Origin of Singers in the Corpus 541
Appendix G. Overview of Multi-Word Units with Lexical Count, CEFR Levels, Topics, and Units 542
Appendix H. Scoring Rubric 587
Appendix I. Normalization and Categorization of Songs Using MATLAB 604
Appendix J. Advantages and Disadvantages of Typical Vocabulary Exercises 615
Appendix K. Instructional Materials and Research Instruments 632
Steps for the Presentation 632
Today's Multi-Word Units Worksheet 633
Cards for the Presentation 634
Pre-Intervention Questionnaire 636
Post-Intervention Questionnaire (Control Group) 639
Post-Intervention Questionnaire (Test Group) 640
Multi-Word Units of Box 3 641
Worksheets for the Entire Series of Lessons Including Help Cards and Worksheets for Fast Finishers of Box 3 645
Lexical Test of Box 3 677
Multi-Word Units of Box 7 679
Worksheets for the Entire Series of Lessons Including Help Cards and Worksheets for Fast Finishers of Box 7 684
Lexical Test of Box 7 716

LIST OF TABLES

Table 1. Comparison of Discrete-Point and Integrative Vocabulary Assessment Methods: Advantages and Disadvantages 18
Table 2. Comparative Analysis of Contemporary Vocabulary Assessment Instruments in Second Language Research 20
Table 3. Overview of Empirical Studies on Vocabulary Learning through Music-Based Instruction in Second Language Contexts 65
Table 4. Overview of Empirical Studies on Vocabulary Learning through Music-Based Instruction in English as a Foreign Language Contexts 72
Table 5. Timeline and Structure of the Intervention 97
Table 6. Teacher Assignments, Participating Schools, and Implementation Timeline 98
Table 7. Overview of Lesson Phases and Instructional Design 101
Table 8. Corpora Frequently Employed in Vocabulary Assessment Research 117
Table 9. Corpus of Authentic Pop Songs: Artists and Release Years (N = 56) 121
Table 10. CEFR Global Scale: Common Reference Levels for Language Proficiency 129
Table 11. Analysis of Sixth-Grade EFL Textbook Units in NRW: Thematic Focus, Grammar, and Lexical Content 132
Table 12. Subject Frequency Distribution 148
Table 13. Frequency Distribution of Subject Variables 148
Table 14. Gender Distribution of Participants 149
Table 15. First Language and Bilingualism Distribution 149
Table 16. Distribution of Exposure to English Outside the School 149
Table 17. Distribution of English Pop Song Exposure 150
Table 18. Distribution of Musical Training 150
Table 19. Summary of Key Subject Variables and Distributions 151
Table 20. Descriptive Statistics for Continuous Variables 154
Table 21. Subject Characteristics Distribution by Category 155
Table 22. Mixed Factorial ANCOVA Results 159
Table 23. Cross-Tabulation of Gender and Group 185

Table 24. Descriptive Statistics for Continuous Variables 188
Table 25. Diagnostic Purpose and Statistical Implications of Visual Analyses 191
Table 26. Descriptive Statistics of the Dependent Variables 207
Table 27. Tests of Normality for Transformed Variables 210
Table 28. Chi-Square Test: Association Between T0 Scores and Group Assignment 214
Table 29. Chi-Square Test: Association Between T1 Scores and Group Assignment 215
Table 30. Chi-Square Test: Association Between T2 Scores and Group Assignment 215
Table 31. Between-Subjects Factors 219
Table 32. Descriptive Statistics of Logit-Transformed MWU Scores Across Test and Control Groups 220
Table 33. Tests of Between-Subjects Effects: Multi-Word Unit Learning Outcomes 221
Table 34. Multivariate Test Results for Multi-Word Units Learning Outcomes 229
Table 35. Contrast Results (K Matrix): Multi-Word Unit Scores Across Time Points 231
Table 36. Tests of Between-Subjects Effects: Individual Predictors of Multi-Word Unit Learning 232
Table 37. Tests of Between-Subjects Effects: Well-Being Outcomes 247
Table 38. Multivariate Test Results (Well-Being) 255
Table 39. Contrast Results (K Matrix): Well-Being Across Groups and Time 257
Table 40. Tests of Between-Subjects Effects: Involuntary Musical Imagery Occurrence 265
Table 41. Contrast Results (K Matrix): Involuntary Musical Imagery Effects on Multi-Word Unit Learning 272
Table 42. Statistical Assumption Violations and Adjustments 293
Table 43. Comparison of Statistical Methods: First Study vs. Second Study 294

LIST OF FIGURES

Figure 1. Comparative Analysis of Receptive and Productive Knowledge at T0 and T1 152
Figure 2. Pre-test (T0) vs. Post-test (T1) Multi-Word Units Scores 156
Figure 3. Cohen's d Effect Size for Multi-Word Unit Learning Gains 157
Figure 4. Intervention Effect across Gender Groups 160
Figure 5. Minimum Sample Size Calculation for Paired t-Test Size 163
Figure 6. Minimum Sample Size Calculation for ANOVA 163
Figure 7. Learner Self-Perception during the Music-Based Intervention 169
Figure 8. Song Stuck in My Head Phenomenon (INMI) Frequency Post-Intervention 170
Figure 9. Perceived Benefits of Music: Pre- and Post-Intervention Comparison 171
Figure 10. Student Perceptions of Multi-Word Unit Learning Effectiveness.. 172
Figure 11. Distribution of Monolingual and Bilingual Participants 181
Figure 12. First Language Profiles of Study Participants 182
Figure 13. Demographic Characteristics: Gender, Group Assignment, Language Background, and Age 184
Figure 14. First Language/Bilingualism Distribution Across Control and Test Groups 186
Figure 15. First Language/Bilingualism Distribution Across Gender Groups 187
Figure 16. Histogram with the Normal Curve: T0 Receptive Knowledge 192
Figure 17. Histogram with the Normal Curve: T0 Productive Knowledge 192
Figure 18. Histogram with the Normal Curve: T1 Receptive Knowledge 193
Figure 19. Histogram with the Normal Curve: T1 Productive Knowledge 193
Figure 20. Histogram with the Normal Curve: T2 Receptive Knowledge 194
Figure 21. Histogram with the Normal Curve: T2 Productive Knowledge 195
Figure 22. Histogram with the Normal Curve: Exposure to English Outside the School 195
Figure 23. Histogram with the Normal Curve: Exposure to English Music 196
Figure 24. Histogram with the Normal Curve: Preference for Pop Music 196
Figure 25. Histogram with the Normal Curve: Willingness to Adapt the Method 197
Figure 26. Histogram with the Normal Curve: Exposure to Pop Songs 197
Figure 27. Histogram with the Normal Curve: Musical Training 198
Figure 28. Histogram with the Normal Curve: Relaxed Well-Being State 198

Figure 29. Histogram with the Normal Curve: Song Stuck in My Head Phenomenon 199
Figure 30. Histogram with the Normal Curve: Pre-Intervention Perceived Music Benefits 199
Figure 31. Histogram with the Normal Curve: Post-Intervention Perceived Music Benefits 200
Figure 32. Histogram with the Normal Curve: Self-Perceived Song Listening Comprehension 201
Figure 33. Histogram with the Normal Curve: Self-Perceived Method Efficacy 202
Figure 34. Histogram with the Normal Curve: Pop Song Preference Distribution 202
Figure 35. Histogram and Boxplot of T0 after Logit Transformation 210
Figure 36. Histogram and Boxplot of T1 after Logit Transformation 211
Figure 37. Histogram and Boxplot of T2 after Logit Transformation 212
Figure 38. Boxplot of Multi-Word Unit Scores (T0) for Test and Control Groups 224
Figure 39. Boxplot of Multi-Word Unit Scores (T1) for Test and Control Groups 224
Figure 40. Boxplot of Multi-Word Unit Scores (T2) for Test and Control Groups 225
Figure 41. Cohen's d Formula 226
Figure 42. Formula for Pooled Standard Deviation 226
Figure 43. Effect Size (Cohen's d) for T0 vs. T1 in the Test Group 226
Figure 44. Effect Size (Cohen's d) for T0 vs. T2 in the Test Group 226
Figure 45. Effect Size (Cohen's d) for T0 vs. T1 in the Control Group 227
Figure 46. Effect Size (Cohen's d) for T0 vs. T2 in the Control Group 227
Figure 47. Estimated Marginal Means at T0 by Group 234
Figure 48. Estimated Marginal Means at T1 by Group 235
Figure 49. Estimated Marginal Means at T2 by Group 236
Figure 50. Estimated Marginal Means of Well-Being at T0 by Group 251
Figure 51. Estimated Marginal Means of Well-Being at T1 by Group 252
Figure 52. Estimated Marginal Means of Well-Being at T2 by Group 253
Figure 53. Mean Involuntary Musical Imagery Scores at T0 for Control and Test Groups 267
Figure 54. Mean Involuntary Musical Imagery Scores at T1 for Control and Test Groups 268

Figure 55. Mean Involuntary Musical Imagery Scores at T2 for Control and Test Groups 268
Figure 56. Estimated Marginal Means: Involuntary Musical Imagery-Related Multi-Word Unit Learning at T0 273
Figure 57. Estimated Marginal Means: Involuntary Musical Imagery-Related Multi-Word Unit Learning at T1 273
Figure 58. Estimated Marginal Means: Involuntary Musical Imagery-Related Multi-Word Unit Learning at T2 274

LIST OF ABBREVIATIONS

ADHD: *Attention Deficit Hyperactivity Disorder*
BDNF: *Brain-Derived Neurotrophic Factor*
BOLD: *Blood Oxygen Level-Dependent*
BPM: *Beats per Minute*
BNC: *British National Corpus*
CEFR: *Common European Framework of Reference for Languages*
DAT: *Dynamic Attending Theory*
DLPFC: *Dorsolateral Prefrontal Cortex*
EDM: *Electronic Dance Music*
EEG: *Electroencephalography*
EFL: *English as a Foreign Language*
ESL: *English as a Second Language*
ERPs: *Event-Related Brain Potentials*
fMRI: *Functional Magnetic Resonance Imaging*
FL: *Foreign Language*
FLA: *Foreign Language Acquisition*
GSL: *General Service List*
HG: *Hesch's Gyrus*
IFG: *Inferior Frontal Gyrus*
IPS: *Intraparietal Sulcus*
KMK: *Kultusministerkonferenz (Conference of Ministers of Education and Cultural Affairs)*
L1: *First Language*
L2: *Second Language*
LTP: *Long-Term Potentiation*
MANCOVA: *Multivariate Analysis of Covariance*
MEG: *Magnetoencephalography*
MMN: *Mismatch Negativity*
MRI: *Magnetic Resonance Imaging*
MWU: *Multi-Word Unit*
NAcc: *Nucleus Accumbens*
NRW: *North Rhine-Westphalia*
PET: *Positron Emission Tomography*
PT: *Planum Temporale*
R^2: *R-squared*
R&B: *Rhythm and Blues*

RQ1: *Research Question 1*
RQ2: *Research Question 2*
RQ3: *Research Question 3*
SLA: *Second Language Acquisition*
SLI: *Specific Language Impairment*
SSIRH: *Shared Syntactic Integration Resource Hypothesis*
STG: *Superior Temporal Gyrus*
T0: *Test Pre-Intervention*
T0 RK: *Receptive Knowledge of the Test Pre-Intervention*
T0 PK: *Productive Knowledge of the Test Pre-Intervention*
T1: *Test Post-Intervention*
T1 RK: *Receptive Knowledge of the Test Post-Intervention*
T1 PK: *Productive Knowledge of the Test Post-Intervention*
T2: *Delayed Test Post-Intervention (Two Weeks After T1)*
T2 RK: *Receptive Knowledge of the Delayed Test Post-Intervention*
T2 PK: *Productive Knowledge of the Delayed Test Post-Intervention*
TMS: *Transcranial Magnetic Stimulation*
TTR: *Type-Token Ratio*

Music is the air that memories breathe

— Antonio Vivone

CHAPTER 1: INTRODUCTION

English is the most widely spoken second language globally, with over 1.5 billion speakers (British Council, 2013; Crystal, 2003; Graddol, 2006). Widely recognized as *lingua franca* in an increasingly interconnected world, English plays a pivotal role in facilitating communication across diverse contexts. It has become the global language for international business, science, technology, and media, making it a prerequisite for global participation and innovation (Graddol, 2000; Jenkins, 2014). Consequently, proficiency in English is no longer merely advantageous but essential for accessing academic opportunities, vocational training, and professional careers (Baker, 2015; Ethnologue, 2023; Statista, 2021).

The societal significance of English is also highlighted in nearly all recent resolutions by Germany's Conference of Ministers of Education and Cultural Affairs (Kultusministerkonferenz). These resolutions emphasize that effective communication in English is nowadays foundational for active and responsible participation in society. Furthermore, they underscore the importance of equipping younger generations with the linguistic competence needed to thrive in diverse and dynamic global environments. By fostering functional communicative competence, English language education aims to enable learners to use English effectively in real-world contexts, reflecting cultural, linguistic, and content-based appropriateness in their communication.

Vocabulary, understood as multi-word units (MWUs), is essential for developing functional communicative competence (Barcroft, 2007; Nation, 2013b; Meara, 1995; Tegge, 2015) and for language competence in general (Frederiksen, 1982; Grabe, 1991; Liu, 2018; Miller, 1999). Its crucial role is now firmly established in English as Foreign Language (EFL) context (Kersten, 2010; Nation, 2001, 2013b; Papantoni & Anastasiadou, 2023; Read, 2004b; Willis & Olashi, 2012), reflecting a shift away from earlier assumptions in language teaching that erroneously prioritized grammar as the cornerstone of language learning (Lewis, 1993; Wilkins, 1972).

Teaching and learning English vocabulary have long posed persistent challenges in EFL context. Research has shown that vocabulary instruction is often perceived as monotonous and demanding (Haß et al., 2017; Nation, 2013b; Sambanis & Böttger, 2016; Schmitt, 2008; Van Lier, 1988; Webb & Chang, 2012a, 2012b). A significant contributing factor to these perceptions is the emotional strain experienced by learners defined as foreign language anxiety (Almurshed & Aljuaythin, 2019; Dolean 2016, Getie, 2020; Russell, 2020). Unlike general anxiety related to individual temperament or classroom conditions, foreign language anxiety arises specifically from the perceived challenge and experience of learning a new language

(Dewaele & Alfawzan, 2018). In particular, EFL classrooms are frequently characterized by elevated levels of anxiety, which have been shown to hinder language development and communicative confidence (Bonilla-Salazar, 2019; MacIntyre & Gardner, 1991). These emotional barriers often impede learners' ability to engage meaningfully with instructional content (Dewaele & Alfawzan, 2018; Getie, 2020; Passiatore et al., 2019; Russell, 2020; Tomczak & Lew, 2019). Moroever, vocabulary instruction has been found to be pedagogically inefficient (Barnard, 1961; Kersten, 2010; Nurweni & Read, 1999; Quinn, 1968; Webb & Nation, 2017), particularly in the early stages of education (Grimm et al., 2015). This body of research underscores the need for more engaging and effective instructional approaches that can transform vocabulary teaching and learning from a perceived burden into a more motivating and meaningful experience (Crystal, 2003; Pavia et al., 2019).

One promising starting point is the integration of pop songs into the EFL classroom. Pop songs have been shown to reduce anxiety (Horwitz et al., 1986; Dolean & Dolean, 2014; Dolean, 2016) and serve as a motivational tool for EFL learners (Miranda, 2013; Summer, 2010), owing to their use of everyday language (Werner, 2019a, 2021b), engaging themes (Haß et al., 2017; Murphey, 1990a), and their prevalence and popularity out-of-class among EFL learners (Mannarelli & Serrano, 2022). Indeed, the combination of the spread of American culture and pop music has dominated the world since 2000, and younger German teenagers aged 12 to 19 years spend an average of 224 minutes online daily, 115 minutes of which are spent listening to English music via Spotify & Co. (Medienpädagogischer Forschungsverbund Südwest, 2023). Therefore, the widespread presence of pop songs and their ability to influence behavior—whether in therapy, politics, advertising, leisure, or education—further underscores their potential as transformative tools in educational contexts (Tomczak & Lew, 2019).

In addition, findings from the neuroscientific field shed light on the possibility of co-storage of song melodies and lyrics in the brain (Gordon et al., 2010; Sammler et al., 2010; Thaut et al., 2005), the activation and cooperation of both brain's hemispheres through singing and any music-based activity (Borchgrevink, 1982; Gruhn & Altenmüller, 1997; Altenmüller et al., 2000), and the overlap between music neurons and language neurons (Brown et al., 2006; Gordon et al., 2010; Kölsch et al., 2000, 2002; Liegeois-Chauvel et al., 1998; Maus et al., 2001; Patel, 2003, 2008, 2012, 2014; Patel et al., 1998; Peretz et al., 1994, 1995; Tallal & Gaab, 2006; Wallin et al., 2000; Zatorre et al., 1994).

Despite this promising theoretical foundation and the intuitive bias that pop songs and music in general can enhance vocabulary learning, empirical evidence supporting the effectiveness of music-based approaches in vocabulary learning re-

mains limited (Busse et al., 2018; Davis, 2017; Falioni, 1993; Hahn, 1972; Ludke, 2010; Mannarelli & Serrano, 2022; Salas, 2006; Salcedo, 2002; Tegge, 2015, 2017; Zeromskaite, 2014; Zola & Sandvoss, 1976), especially in EFL context (Degrave, 2019; Mary, 2022; Medina, 1990, 1993, 2002; Murphey, 1990b; Sposet, 2008).

Moreover, the evidence on the impact of music on vocabulary learning remains inconclusive, likely due to considerable variation in research aims, study designs, and methodological choices. These differences include the specific objectives, research questions, hypotheses, the materials used (e.g., target vocabulary and accompanying elaboration activities), assessment methods, types of memory retrieval measured (recognition vs. recall), and the age groups involved (Tomczak & Lew, 2019). While several studies revealed a positive impact of music on vocabulary learning (Hahn, 1972; Good et al., 2015; Smith Salcedo, 2002; Salas, 2006; Ludke, 2010), others found no difference between a music-based and non-music-based approach (Medina, 1990; Ludke, 2010). Nevertheless, these studies were primarily conducted in controlled laboratories or idealized classroom settings requiring impractical resources. Only three small-scale studies were conducted in real classroom settings and only in primary school: Medina (1990) with 48 pupils, Good et al. (2005) with 28 children, and Chen (2020) with 84 pupils.

In addition to these methodological limitations, no studies to date have systematically incorporated vocal training for vocabulary learning in EFL contex (Swaminathan & Gopinath, 2013). The only partial exception is Bygrave's (1995) study, which included a form of musical training. However, this study did not involve structured vocal training, and the notion of singing as a pedagogical tool for vocal training was insufficiently defined. Key variables—such as the duration and frequency of the training, the integration of vocal and instrumental activities, and the balance between listening, singing, and playing—were not clearly specified, limiting the interpretability and replicability of the findings.

In response to these gaps, the present research investigated the impact of vocal training with selected pop songs on MWU learning in an EFL context. In addition, this research explored learners' well-being and the role of involuntary musical imagery (INMI)—commonly referred to as earworms or the "song stuck in my head phenomenon"—in supporting the learning of MWUs. To operationalize these aims, the current empirical research addressed the following research questions within an ecological classroom setting in German secondary schools:

- **Research Question 1**: To what extent does vocal training with selected English pop songs enhance receptive and productive MWU learning in a lower secondary EFL context compared to a non-music-based approach?

- **Research Question 2**: To what extent does vocal training with selected English pop songs foster learners' well-being compared to a non-music-based approach? Furthermore, how does well-being influence the learning of receptive and productive English MWUs?

- **Research Question 3**: To what extent does vocal training with selected English pop songs induce INMI? Moreover, how does INMI facilitate the learning of receptive and productive English MWUs?

Grounded in insights from cognitive neuroscience, music psychology, and language pedagogy, this study built on the premise that emotional engagement evoked by music was thought to strengthen memory and recall, while singing might foster collaboration, reduce performance pressure, and promote active participation (Altenmüller, 2006; Overy & Molnar-Szakacs, 2009; Williamson & Müllensiefen, 2012). By reducing anxiety and inducing a state of well-being, vocal training could not only support MWU learning but also trigger INMI, reinforcing linguistic recall. Additionally, vocal training engaged multiple sensory modalities, potentially stimulating both brain hemispheres and enhancing, in turn, MWU learning (Abbot, 2002; Engh, 2013).

Beyond its affective and multisensory benefits, songs may further aid MWU learning by providing temporal frameworks that support the segmentation, encoding, and retrieval of linguistic input (Tomczak & Lew, 2019; Wallace, 1994), particularly during the early stages of foreign language acquisition (Schön et al., 2008). Specifically, pop songs' linguistic and musical repetitiveness may enhance MWUs retention, while also exposing learners to authentic linguistic input, bridging the gap between classroom instruction and real-world language use (Werner, 2019a).

From a cognitive neuroscience perspective, rhythmic patterns are thought to synchronize neural oscillators, thereby improving attention and information processing (Fotidzis et al., 2018). These effects offer indirect support for Patel's Shared Syntactic Integration Resource Hypothesis (SSIRH), which posits overlapping neural pathways for the processing of music and language (Kölsch & Jentschke, 2008; Patel, 2003, 2008, 2012, 2014). This theoretical framework provides a compelling rationale for exploring the use of music-based approaches in vocabulary instruction.

While these potential benefits offer promising pedagogical opportunities, the implementation of a music-based approach also presents several challenges that warrant careful consideration across musical, linguistic, educational, and neuroscientific domains. From a musical perspective, musical preferences may significantly influ-

ence the effectiveness of the intervention: enjoyable songs are more likely to support memory retention, whereas songs that are disliked may hinder engagement and learning outcomes (Krashen, 1985a; Hodges & Wilkins, 2015).

From a linguistic standpoint, pop songs often include non-standard grammatical structures and complex language, which can pose difficulties for beginner learners. This highlights the importance of selecting pop songs that are appropriate for learners' proficiency levels and pedagogical objectives (Hu & Nation, 2000). From an educational perspective, intensive interventions risk promoting short-term retention without long-term benefits, emphasizing the importance of strategies such as spaced repetition and the use of familiar content to reinforce learning (Webb & Nation, 2017). On a cognitive level, the simultaneous processing of melody and lyrics may lead to cognitive overload of learners' capacity (Calvert & Billingsley, 1998; Racette & Peretz, 2007).

Against this backdrop of theoretical promise and practical challenges, this research aimed to offer empirical insights into the effectiveness of music-based approach for MWU learning in EFL context, advancing knowledge at the intersection of music education, neuroscience, and English didactic. By developing and empirically investigating a multidisciplinary framework, the study examined the cognitive, affective, and motivational benefits of integrating vocal training with selected English pop songs, with a specific focus on MWUs, learner well-being, and INMI.

Rather than considering pop songs as merely recreational tools, this research positioned them as structured, pedagogically meaningful resources within the EFL classroom. By extending inquiry beyond laboratory environments, it contributed to the growing body of applied research that emphasizes ecological validity and real-world classroom relevance. This, in turn, laid the foundation for an interdisciplinary curriculum design that meaningfully integrates music and language learning.

The pedagogical orientation of this approach aligns with current trends in language education that emphasize student-centered, communicative, and inclusive instruction. By addressing learners' diverse cognitive and emotional needs, the intervention fostered confidence, reduced anxiety, and promoted engagement. Moreover, by encouraging autonomous and affective learning beyond the classroom, the study highlighted the value of bridging formal instruction with informal language exposure—an important step toward fostering sustainable and lifelong vocabulary learning practices.

Furthermore, this study contributed to neuroscience-informed perspectives on language acquisition by offering indirect empirical support for Patel's SSIRH and theories regarding the co-storage of lyrics and melodies in the brain. While not neuroscientific in nature, the findings provided pedagogically relevant insights into

whether and how music-based approaches may activate linguistic memory processes, thereby reinforcing the potential role of music in vocabulary learning. Taken together, the empirical observations and interdisciplinary approach of the research offered insights into how music may support emotionally positive, cognitively engaging, and pedagogically meaningful vocabulary learning in EFL contexts.

To guide the reader through the progression of this investigation—from its theoretical grounding to its empirical implementation and outcomes—the structure of the dissertation is organized into six chapters.

Chapter 1 outlines the rationale, scope, and objectives of the study by situating it within the broader context of English as a global language and highlighting persistent challenges in vocabulary instruction. It briefly introduces the theoretical foundations, identifies empirical gaps, and formulates the research questions guiding the investigation into the effects of pop song-based vocal training on MWU learning, learner well-being, and INMI in EFL contexts. Chapter 2 establishes the theoretical framework by presenting five core research constructs: vocabulary knowledge, vocal training, well-being, INMI, and shared neural pathways for music and language hypotheses. This is followed by a comprehensive review of empirical studies on the role of music in first and second/foreign language acquisition. The chapter concludes by identifying the research gap, restating the research questions, and discussing both the challenges and the pedagogical potential of the music-based approach. Chapter 3 describes the research design and methodological framework. It outlines the study's aims and details the intervention structure, including the instructional phases, variables, lesson plans, selected songs and MWUs, as well as the measurement instruments (vocabulary tests and scoring rubrics) and their validation procedures. Chapter 4 presents the design, implementation, and analysis of the first study. It describes the intervention procedures, the administration of pre- and post-tests, and the qualitative and quantitative methods employed. The chapter also discusses key findings, including effect size estimations and observational insights, which informed the refinement of the second study. Chapter 5 reports the results of the second study, offering a detailed statistical analysis using MANCOVA to evaluate receptive and productive MWU learning while controlling for relevant covariates such as prior English MWUs knowledge, gender, L1/bilingualism, exposure to English and pop songs, and previous musical training. It describes data preparation (e.g., logit transformations), descriptive statistics, cross-tabulations, and chi-square analyses. The findings are presented through effect sizes, contrast analyses, and figures. Chapter 6 synthesizes findings from both studies through a comparative analysis, situates them within relevant theory and research, discusses empirical and pedagogical contributions, ad-

dresses key limitations, and offers recommendations for future research and music-based MWU instruction in EFL contexts.

CHAPTER 2: THEORETICAL AND EMPIRICAL FOUNDATIONS

Tracing back to the philosophical arguments of Plato and Aristotle, the relationship between music and language holds profound historical significance. The ancient Greek term *mousike*, meaning the "art of the Muses," suggests a divine origin of music, representing the integration of poetry, dance, and melody into a unified art form. This unity is not merely aesthetic but essential to defining individuals as beings who think, act, and feel (Henderson, 1957). In preliterate cultures, music and poetry served as vital tools for preserving and transmitting knowledge, acting as memory aids for recounting events and marking locations (Basso, 1996; Feld & Basso, 1996, p. 109; Weiner, 1991, p. 45).

The close relationship between music and language can be also attributed to their shared structural and functional characteristics. Both language and music originate from the manipulation of auditory elements and serve as vehicles for communication (Ma et al., 2024; Xi, 2021), whether through music-based expression or spoken discourse (Besson et al., 1997; McMullen & Saffran, 2004; Patel, 2008). Both follows structural rules (Christiner et al., 2021; Degrave, 2021; Werner, 2018; Xi, 2021) and include emotional elements (Benítez-Burraco & Nikolsky, 2023; Tomczak & Lew, 2019; Xi, 2021). Furthermore, music and language share core features, including pitch, volume, emphasis, stress, tone, tempo, and pauses (Brandt et al., 2012; Patel, 2008). Moreover, it appears that humans process musical and spoken linguistic input in a similar way, involving interconnected neural networks (Busse et al., 2021; Christiner & Reiterer, 2018; Degrave, 2021; Leongómez et al., 2022; Moosbrugger, 2025; Tomczak & Lew, 2019; Werner, 2018). As Chobert and Besson (2013) summarize,

> Music and speech are complex auditory signals based on the same acoustic parameters: frequency, duration, intensity, and timber. They comprise several levels of organization: morphology, phonology, semantics, syntax, and pragmatics in language and rhythm, melody, and harmony in music. Moreover, perceiving and producing music and speech require attention, memory, and sensorimotor abilities. (p. 924)

This overlap is not merely coincidental but reflects their common cognitive and evolutionary foundations. Several theoretical approaches propose that language and music evolved from a common ancestral system—*musilanguage*—characterized as holistic, manipulative, multimodal, musical, and mimetic (Benítez-Burraco & Nikolsky, 2023; Brown, 2000; Leongómez et al., 2022; Marjanen, 2016; Masataka, 2007; Mithen, 2005; Richter & Ostovar, 2016; Rousseau, 1781). This proposition aligns with Darwin's (1871) hypothesis of musical protolanguage, which posits that

both speech and music originated from a shared evolutionary precursor shaped by the imitation and modification of natural sounds, animal calls, and instinctive human vocalizations (p. 3).

The understanding of the complex interconnection between music and language has significantly expanded, as evidenced by recent advancements in the fields of psychology, neurophysiology, neuroscience, and cognitive science. Indeed, contemporary neuroscientific and cognitive research indicate that in early in one's life, the human brain does not differentiate between language and music (Brandt et al., 2012; Trainor & Trehub, 1992; Trehub et al., 2000). Instead, language is considered by the brain as a "special case" of music, emerging from a common cognitive root. Notably, musical elements appear to facilitate linguistic development even before phonetic distinctions are fully acquired (Papousek, 1996). For instance, infants' early associations between sound patterns and meaning are shaped by the melodic contours of infant-directed speech—*motherese*— (Christiner et al., 2021; Fernald, 1989; Marjanen, 2016), while their understanding of syntactic structures is likewise influenced by rhythmic and pitch cues (Jusczyk et al., 1992; Jusczyk & Krumhansl, 1993; Krumhansl & Jusczyk, 1990). Moreover, infants rely on the musical properties of language—rhythm, timbral contrast, and melodic contour—as scaffolding for the later development of semantics and syntax (Brandt et al., 2012).

Given the natural and neurological similarities between music and language and the hypothesized common origin of them, integrating music into vocabulary learning appears to be a promising field of investigation. However, despite this promising theoretical background, relatively few empirical studies have been conducted, and the findings remain inconclusive. Some researchers report positive effects (Legg, 2009; Medina, 1990; Salcedo, 2010), while others found no significant advantage or attributed improvements to factors such as presentation rate (Kilgour et al., 2000; Racette & Peretz, 2007). Moreover, most studies have focused on highly controlled settings or idealized classroom conditions, often overlooking real-world school environments. This points to a significant gap in the literature concerning the use of a structured music-based approach for vocabulary learning in authentic secondary school settings—a gap that underpins the rationale for the present study.

To provide the necessary theoretical grounding for this investigation, the current chapter is divided into two sections. The first outlines the five key research constructs that inform the study's conceptual framework. The second offers a review of empirical research on the use of music in foreign language instruction, illustrating how the current project builds on and diverges from previous work.

2.1 Core Constructs and Conceptual Foundations

This section introduces the five core constructs that underpin the present research: vocabulary knowledge, vocal training, well-being, involuntary musical imagery (INMI), and neuroscientific evidence regarding the cognitive and neural mechanisms that support the overlap between music and language processing. Together, these constructs form the conceptual basis for understanding how vocal training with English pop songs may facilitate multi-word units (MWUs) learning in EFL contexts.

2.1.1 Vocabulary Knowledge and Assessment

A fundamental question in understanding vocabulary knowledge is: *What does learning a word mean?* In the field of applied linguistics, Schmitt (2000) noted that "The mechanisms of vocabulary learning are still a mystery, but one thing can be sure of is that words are not instantaneously acquired … instead, they are gradually learned over some time from numerous exposures" (p. 4). This gradual process is not dichotomous (i.e., known versus unknown) but occurs along a continuum that ranges from no knowledge to partial and, eventually, complete knowledge (Henriksen, 1999).

Building on this developmental view, researchers have proposed two main conceptualizations of vocabulary knowledge: unidimensional and multidimensional. According to the unidimensional perspective, vocabulary knowledge is seen as an integrated whole, where different aspects of word knowledge are inseparable and mutually reinforcing. González-Fernández (2022), Schmitt and Schmitt (2020), and Spencer et al. (2015) argue that "this unidimensionality means that the various types of word knowledge are highly integrated aspects of vocabulary knowledge that function inseparably from each other" (González-Fernández, 2022, p. 1125). These aspects include spoken and written forms, word parts, form-meaning relationships, conceptual referents, associations, grammatical functions, collocations, and constraints on use. Each aspect encompasses both recognition and recall, aligning with the broader distinction between *receptive* and *productive* vocabulary knowledge.

In contrast, the multidimensional view, while less supported by empirical studies, is widely accepted as a more nuanced representation of vocabulary knowledge (Kieffer & Lesaux, 2012; Li & Kirby, 2015; Nation, 2013b). This framework organizes word knowledge into three domains: form (pronunciation, spelling, morphology), meaning (semantic associations, referents), and use (grammatical behavior, collocational range, and pragmatic constraints) (Aitchison, 1994; Laufer, 1997; McCarthy, 1990; Miller, 1999; Nation, 1990, 2001, 2013b; Richards, 1976; Schmitt, 1993, 1994, 1998, 2000).

Notably, these aspects of vocabulary knowledge do not develop simultaneously (Schmitt, 2014). Indeed, the form-meaning aspect—often referred to as *size* or *breadth vocabulary knowledge* (Webb, 2007a)—is typically acquired earlier than the *depth vocabulary knowledge*, which includes grammatical functions, collocations, and constraints on use (Hu & Nation, 2000; Laufer, 1989; Nation, 2020; Schmitt et al., 2011). However, research suggests that breadth and depth of vocabulary knowledge are closely interrelated and mutually reinforcing (Li & Kirby, 2015; Qian, 2002; Schmitt, 2014; Tannenbaum et al., 2006). Therefore, the importance of learning and teaching all the facets of a word is mainly based on the logical idea that second or foreign language learners have to know different aspects of a word in order to correctly fulfill communicative tasks (i.e., reading, listening, writing, and speaking).

Closely related to these dimensions is the distinction between *receptive* and *productive* vocabulary knowledge. Receptive knowledge refers to the ability to recognize and understand words when encountered in listening or reading, while productive knowledge involves the ability to use words accurately in speaking and writing (Laufer & Paribakht, 1998; Melka, 1997; Nation, 2020; Schmitt, 2000; Webb, 2005, 2008a; Webb & Nation, 2017). Productive knowledge is considered more challenging to develop, as it is assumed that most words first enter a learner's passive vocabulary and may later become accessible for active use. It is also widely acknowledged that only a restricted portion of our passive vocabulary will transition to active usage (Henriksen, 1999).

Historically, vocabulary learning was often reduced to rote memorization, emphasizing the link between form and meaning. However, this view has evolved, with growing recognition that vocabulary knowledge is far more complex and dynamic (Brown, 1995; Nation, 2020). A significant shift in recent research has been the reconceptualization of vocabulary as encompassing not only single words but sequences of words that function as single meaningful units (Böttger, 2016; Ellis, 1996; Hutz, 2018; Lewis, 2000; Sambanis, 2013; Schmitt, 2000; Thornbury, 2019; Tomczak & Lew, 2019; Wood, 2010; Wray, 2002, 2008).

Many terms have been used to describe these word sequences, with some researchers identifying more than 57 distinct labels (e.g., Wray, 2002). Schulz et al. (2023) highlighted this challenge, writing that "The term describing the concept 'multi-word units' in relevant literature was of concern because research provides no uniform conceptualization" (p. 10). Wood (2010) echoed this challenge, writing,

> The phenomenon we are dealing with is by no means unitary, and the classifications and taxonomies are somewhat leaky or slippery—the distinctions between, for example, a collocation and an idiom are blurry. It's intriguing to

note that particular researchers have somewhat arbitrarily composed their own sets of descriptions, classifications, and definitions of the various types. (p. 50)

Pawley and Syder (1983), Czarnecka (2011), and Wray (2012, 2013) have all suggested that MWUs encompass a broader range of word sequences, from idiomatic expressions to collocations, including prefabricated routines, formulaic sequences, and lexical chunks[1]. Nattinger and DeCarrico (1992) defined this linguistic phenomenon as formulaic sequences, asserting that "from phrasal verbs to idioms, from greeting formulae to song lyrics, 'formulaic sequences are ubiquitous in language use'" (p. 471). Wray (2002) also used the term formulaic sequences, defining them as sequences "continuous or discontinuous of words or other elements, which is or appears to be, prefabricated: that is, stored and retrieved whole from memory at the time of use, rather than being subject to generation or analysis by the language grammar" (p. 9).

Despite ongoing efforts to define this linguistic phenomenon, a universally accepted terminology has yet to emerge. This lack of consensus not only complicates scholarly discourse but also hinders the establishment of a unified theoretical framework. Nonetheless, there is broad agreement among researchers regarding three core characteristics that define MWUs. First, MWUs are composed of fixed or semi-fixed word combinations (Wood, 2010). Second, they function as single semantic or pragmatic units, conveying a unified meaning (Wood, 2010). Indeed, a MWU is equivalent to a single morpheme regarding the space in the mental lexicon[2] and the processing effort required for its production and comprehension (Wray, 2008). Third, they are mentally stored and retrieved in mental lexicon not as isolated items, but as whole chunks (Ellis, 1996; Lewis, 2000; Nattinger, 1980; Wray, 2002). In this regard, Tomczak and Lew (2019) emphasised that single words "are chunked into longer strings of words … encoded, retained, and eventually retrieved from the long-term memory as one unit" (p. 23).

Building on this perspective, Tomczak and Lew's (2019) definition of MWUs will be adopted for this research as a broad umbrella term. According to them,

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[1] In linguistics, multi-word units (MWUs) include a range of fixed or semi-fixed sequences processed as single units of meaning. These encompass idiomatic expressions—phrases whose meanings are not directly inferable from their components (Crystal, 1997); collocations—word combinations that co-occur more frequently than chance would predict and sound natural to native speakers (Krishnamurthy, 2006); prefabricated routines—memorized sequences used without internal analysis, often by language learners (Hakuta, 1974); formulaic sequences—expressions with specific meanings or functions that may not align with their literal interpretation (Wray, 2008); and lexical chunks—frequently occurring word sequences processed holistically, from simple pairings (e.g., "strong tea") to complex expressions (e.g., "kick the bucket") (Schmitt, 2000).

[2] Mental lexicon is an internalized cognitive repository of words that stores linguistic materials of varying sizes, from single morphemes to lengthy MWUs (Henriksen, 1999; Wray, 2008).

MWUs encompass "all kinds of word combinations, selected from a plethora of alternative terms that have been featured in the extensive literature" (Tomczak & Lew, 2019, p. 18). Moreover, MWUs are any sequence of words that tends to be stored as a single lexical item and recognized as a fixed expression in language use, regardless of whether its meaning can be directly inferred from its individual words. The conceptualization of MWUs as language chunks that are produced and recalled as wholes remains an evolving area of research. Despite growing interest, the field still lacks a unified theoretical direction and exhibits considerable variation in methodologies and assumptions (Wray, 2002, 2008).

Several theoretical frameworks have emerged to explain the mechanisms underlying MWU retrieval. For instance, Weinert (1995) proposed that retrieval may depend on the sequential order of constituent elements, phonological cues such as rhythm and stress, or the recognition of boundary words that act as triggers. Alternatively, MWUs may be stored as semantic-pragmatic clusters or bundles, retrieved based on communicative intent, contextual relevance, and functional meaning. Retrieval, therefore, can range from fully automatic to partially controlled, depending on contextual factors and cognitive load.

While these theoretical frameworks offer diverse perspectives on how MWUs are stored and retrieved, they converge on the idea that such units function as holistic linguistic entities. This theoretical understanding is not only foundational for conceptualizing MWUs but is also essential for guiding empirical investigations. Indeed, the cognitive architecture proposed in these models has prompted researchers to examine how MWUs operate in real-time language processing and what pedagogical implications arise from their use. The following section explores these cognitive and educational benefits in greater detail.

From a cognitive standpoint, MWUs reduce processing demands by leveraging long-term memory resources. Conklin and Schmitt (2008) observed that the mind stores prefabricated chunks of language in long-term memory, thereby alleviating the cognitive load placed on working memory during real-time language production. This mechanism allows learners to bypass the effortful process of constructing sentences word by word, relying instead on ready-made linguistic sequences. These insights align closely with Cognitive Load Theory (Sweller, 1988, 1993, 2003; Plass et al., 2010), which posits that well-structured knowledge in long-term memory reduces the burden on working memory. Plass et al. (2012) emphasized that chunking smaller elements into larger, meaningful units enhances processing efficiency. Echoing this view, Tomczak and Lew (2019) noted that reducing short-term memory load through MWUs can also boost learners' confidence in language use. Moreover, eye-tracking and read-aloud experiments conducted by Ellis et al. (2008) showed

that MWUs are processed as single lexical entries, rather than as strings of individual words. Similarly, Underwood et al. (2004) demonstrated that both first and second language learners process MWUs more rapidly than non-idiomatic phrases, highlighting their facilitative role in comprehension and production.

In the field of foreign language education, MWUs have been shown to support fluency and accelerate the learning process. Myles et al. (1999) and Eskildsen (2009) found that learners often begin by using unanalyzed chunks—such as common question forms—which serve as scaffolds for language production. Over time, these chunks are internalized and reanalyzed, contributing to the development of abstract grammatical knowledge (Kersten, 2015). This developmental path is central to usage-based learning models (Behrens, 2009; Goldberg, 2006; Tomasello, 2009), which emphasize the extraction of recurring patterns and functions from language input.

Building on this understanding, several researchers have emphasized the pedagogical importance of focusing on chunks rather than isolated lexical items. Conzett (2000) argued that one of the most important changes teachers can make is to redirect students' attention from individual words to multi-word chunks. Similarly, Tegge (2015) advocated that vocabulary learning should be viewed not as the isolated accumulation of single words, but as the acquisition of structured, meaningful sequences that are stored and retrieved holistically. This approach not only fosters fluency but also minimizes cognitive load during communication. Nation (2001) and Pawley and Syder (1983) similarly highlighted the role of MWUs in achieving native-like fluency and selection—the latter defined as the ability to produce natural and contextually appropriate expressions. Schmitt (2000) added that MWUs streamline language use by reducing processing demands, while Nation & Webb (2011) and Peters (1983) noted that handling larger units enables learners to focus more effectively on discourse-level organization. Expanding on this, Tomczak and Lew (2019) concluded that MWUs promote faster, more fluent, and more native-like processing, and help minimize errors.

The importance of MWUs is also evident in early language development. Research shows that children rely heavily on formulaic and item-based expressions before fully analyzing word-level meanings. Behrens (2009) observed that these constructions are foundational in early speech, while Grimm et al. (2017) proposed the MWU acquisition hypothesis, suggesting that knowledge of MWUs precedes and supports the acquisition of individual lexical items. This aligns with Sinclair's (1991) principle that many semi-preconstructed phrases serve as single units of meaning, even if they appear segmentable. Schulz et al. (2023) reinforced this view, identifying MWUs as catalysts for early communicative agency in second language (L2)

learners. Further evidence by Arnon and Clark (2011) showed that MWUs can facilitate the internalization of smaller linguistic elements embedded within them. Kersten (2010) argued that such units provide learners with flexible templates containing open slots, which can be adapted across contexts. Repeated exposure to these patterns, Kersten emphasized, helps young learners implicitly acquire grammatical rules and develop their own syntactic structures and discourse.

The educational value of MWUs has also been acknowledged at the policy level. As early as 1974, Hakuta proposed that MWUs integrate vocabulary and grammar. More recently, the Ministry of Education and Cultural Affairs of North Rhine-Westphalia introduced the concept of *lexicon-grammar units* (*lexiko-grammatische Einheiten*) in the revised foreign language curriculum for elementary and middle schools. This concept positions vocabulary and grammar as interdependent components and underscores their joint contribution to developing communicative competence. The curriculum outlines three progressive learning goals: first, learners should use simple sentence patterns and well-memorized phrases to navigate everyday situations; second, they should apply familiar expressions to meet basic communicative needs; and third, they should adapt learned phrases to novel contexts through substitution. The institutional inclusion of lexicon-grammar units reinforces the centrality of MWUs in practical language use and instructional planning.

Taken together, these insights highlight the cognitive and instructional significance of MWUs in language development. By reducing cognitive load, promoting fluency, and enabling more efficient processing, MWUs function as essential "building blocks" in both first and second/foreign language acquisition and retention. Educators should therefore move beyond a focus on isolated words and align their instructional practices with cognitive and communicative principles that emphasize the teaching of MWUs.

This pedagogical shift also prompts a reconsideration of how vocabulary knowledge—particularly in relation to MWUs—should be assessed. Despite broad recognition of vocabulary as a multidimensional construct (Kieffer & Lesaux, 2012; Li & Kirby, 2015; Nation, 2013b), current assessment practices often fail to reflect this complexity. Most traditional vocabulary assessments still focus heavily on the "form-meaning" association, overlooking other vital dimensions such as lexical use, depth of knowledge, and contextual appropriateness. This misalignment between how vocabulary is taught and how it is assessed presents a major challenge for educators and researchers alike.

To address this issue, various theoretical frameworks have been developed to better conceptualize the nature of vocabulary knowledge and inform more accurate assessment practices. Among these, the developmental approach conceptualizes vo-

cabulary learning as a continuum, progressing from minimal knowledge to full mastery, and highlights the gradual deepening of understanding over time. The lexical network approach examines associative links among words, often explored through free word association tasks that tap into recognition-based knowledge. Meanwhile, the components approach—also known as the dimensions approach—breaks vocabulary knowledge into distinct elements such as form, meaning, and use, offering a granular and structured perspective on what it means to "know" a word. Together, these frameworks underscore the multidimensional nature of vocabulary knowledge and provide a theoretical basis for designing assessments that are better aligned with how vocabulary is acquired and used in real-world contexts.

Building on these frameworks, effective vocabulary assessment must also adhere to five foundational principles: practicality, reliability, validity, authenticity, and washback (Brown, 2004; Döring & Bortz, 2016; Messick, 1980, 1989; Weir, 2005). A practical assessment is cost-effective, time-efficient, easy to administer, and has clearly defined procedures for scoring and evaluation. Reliability ensures consistency of results across varying conditions, accounting for learner-related factors such as anxiety or illness, test-related design issues like excessive length or poor formatting, and rater-related factors including subjectivity and inter-rater inconsistencies.

Of these principles, validity is arguably the most complex to define. Validity refers to the degree to which inferences drawn from assessment results are appropriate, meaningful, and relevant to the test's intended purpose (Gronlund, 1998, p. 226). Validity is not a static property of a test but is instead supported by multiple forms of evidence. These may include content validity (alignment between test content and learning objectives), criterion-related evidence (how well test scores reflect defined performance goals), construct validity (whether the test measures the theoretical construct it claims to assess), and consequential validity, which addresses students' perceptions of fairness, relevance, and learning value (Mousavi, 2002; Hughes, 2003; Davidson et al., 1985; Gronlund, 1998).

Closely tied to validity is the concept of authenticity. According to Bachman and Palmer (1996), authenticity refers to the extent to which a test task reflects real-world language use. Authentic tests use natural language, meaningful content, and realistic contexts that not only enhance learner engagement but also provide more accurate insights into communicative competence.

The final principle, washback, refers to the influence of assessment on teaching and learning practices (Hughes, 2003). Tests with positive washback encourage beneficial instructional and learning behaviors, whereas negative washback—such as teaching to the test—can narrow the educational experience. High-stakes assess-

ments, in particular, often shape curriculum content, instructional strategies, and student preparation in significant ways (Brown, 2004).

Translating these frameworks and principles into practical testing formats, vocabulary assessments are generally categorized into discrete-point and integrative approaches. The discrete-point approach, rooted in structuralist theories of language learning, focuses on isolated language components—often tested through true/false items, multiple-choice questions, or phonemic discrimination tasks. This method is valued for its objectivity and practicality but tends to lack contextual depth and communicative relevance (Hidri, 2018).

In contrast, the integrative approach evaluates vocabulary within broader communicative contexts. Tasks such as cloze tests, dictation, and the C-Test require learners to engage multiple linguistic competencies simultaneously—grammar, vocabulary, discourse knowledge—often reflecting real-life language use (Oller, 1979; Davis & Rinvolucri, 1988). For instance, dictation assesses listening comprehension, spelling, and syntactic processing, while cloze tests emphasize contextual inference. Integrative assessments are thus more authentic and holistic, but they pose design challenges, particularly in terms of developing clear scoring rubrics and ensuring reliability when evaluating complex language performances.

Ultimately, both approaches offer distinct strengths and limitations. Recognizing their respective affordances allows educators and researchers to make informed choices based on instructional/ research goals, learner needs, and assessment contexts. Table 1 provides a comparative overview of the advantages and disadvantages of discrete-point and integrative assessment methods.

Table 1. *Comparison of Discrete-Point and Integrative Vocabulary Assessment Methods: Advantages and Disadvantages*

Test type	Advantages	Disadvantages
Discrete-point test	• Efficient, objective scoring • Simple administration and statistical analysis • Suitable for both norm-referenced and criterion-referenced assessment	• Focuses on knowledge rather than application • Limited ability to assess broader language components • Lexical items are fragmented and decontextualized

Test type	Advantages	Disadvantages
Integrative test	• Focus on the ability to use language effectively for communication • Acknowledges the need for integrated language skills • Lexical items are integrated and contextualized	• Difficulty in crafting clear, comprehensive rubrics and descriptors • May lack reliability

As illustrated in Table 1, discrete-point and integrative approaches offer distinct advantages and face specific limitations. Recognizing the complementary nature of these methods provides a foundation for understanding how modern vocabulary assessments are evolving. Increasingly, test developers adopt a blended approach, strategically integrating discrete-point and integrative elements to capitalize on their respective strengths. This combination allows for a more robust and balanced evaluation of vocabulary knowledge, as it addresses both segmented components (e.g., form and meaning) and contextualized language use (e.g., use in communicative tasks).

Building on this foundation, Table 2 presents an in-depth overview of widely used vocabulary tests in academic research. It illustrates how each test aligns with the theoretical frameworks and assessment principles discussed in the previous sections. By synthesizing key characteristics across a range of assessments, the table facilitates a nuanced comparison and helps identify how individual tests operationalize theoretical and practical dimensions of vocabulary assessment. Specifically, Table 2 examines the following features:

- **Assessment method**: Distinguishes between discrete-point and integrative formats.
- **Knowledge type**: Indicates whether the test measures receptive knowledge, productive knowledge, or both.
- **Test format**: Identifies whether the test is administered in print, interactively, or in both modes.
- **Lexical scope**: Clarifies whether the test targets single words, MWUs, or both.
- **Vocabulary dimensions**: Assesses the extent to which the test covers Nation's (2013a) tripartite model of vocabulary knowledge-form, meaning, and use.

- **Contextualization**: Evaluates whether lexical items are tested in context or in isolation.
- **Translation component**: Notes whether the test includes translation to or from the learner's first language, distinguishing monolingual and bilingual formats.
- **Depth vs. breadth**: Examines whether the test focuses on deep vocabulary knowledge, broad coverage, or both.
- **Competence type**: Specifies whether the test measures recall, recognition, or a combination of them.

Table 2. *Comparative Analysis of Contemporary Vocabulary Assessment Instruments in Second Language Research*

Test	Author(s) and year	Frequency basis	Assessment method	Strengths	Limitations
Vocabulary Knowledge Scale	• Paribakht and Wesche (1993) • Wesche and Paribakht (1996)	n/a	Integrative test	• Both receptive and productive knowledge • Both recognition and recall	• Only single words • Only print format • Form and meaning (no use) • Decontextualized words • No translation (monolingual) • Depth vocabulary knowledge
Word Associates Format	Read (1993, 1998)	n/a	Discrete-point test	Single words and MWUs	• Only receptive knowledge • Only print format • Meaning and limited assessment of form (no use)

Test	Author(s) and year	Frequency basis	Assessment method	Strengths	Limitations
					• Decontextualized words • No translation (monolingual) • Only recognition • Depth vocabulary knowledge
Vocabulary Levels Test	• Nation (1983, 1990) • Schmitt et al. (2001)	5,000 most frequent words from the General Service List	Discrete-point test		• Only receptive knowledge • Only print format • Only single words • Form and meaning (no use) • Decontextualized words • No translation (monolingual) • Only recognition • Depth vocabulary knowledge
Productive Vocabulary Levels Test	Laufer and Nation (1999)	VP-Classic (GSL + UWL	Discrete-point test	Contextualized words	• Only productive knowledge • Only print format • Only single words • Form and meaning (no use)

Test	Author(s) and year	Frequency basis	Assessment method	Strengths	Limitations
		), 2-10k			• No translation (monolingual) • Only recall • Depth vocabulary knowledge
Vocabulary Size Test	Nation and Beggar (2007)	BNC-Coca, 1-14k	Discrete-point test	• Both interactive and print formats • Contextualized words	• Only receptive knowlege • Only single words • Only meaning (no form, no use) • No translation (monolingual) • Breadth vocabulary knowledge • Only recognition
Eurocentres Vocabulary Size Test	Meara and Jones (1987)	Hindmarsch (Eng),1-10k	Discrete-point test	Both interactive and print formats	• Only receptive knowledge • Only single words • Only meaning (no form, no use) • Decontextualized words • No translation (monolingual) • Breadth vocabulary knowledge

Test	Author(s) and year	Frequency basis	Assessment method	Strengths	Limitations
					• Only recognition
Computer Adaptive Test of Size and Strength	Levitzky-Aviad and Laufer (2013)	BNC-Coca, 1-10k	Discrete-point test	• Both productive and receptive knowledge • Translation (bilingual) • Both depth and breadth vocabulary knowledge • Both recall and recognition	• Only interactive format • Only single words • Form and meaning (no use) • Decontextualized words
Picture Vocabulary Size Test	Anthony and Nation (2017)	Corpus of US/UK childrens' media, 1-6k	Discrete-point test	Both interactive and print formats	• Only receptive knowledge • Only single words • Form and meaning (no use) • Decontextualized words • No translation (monolingual)

Test	Author(s) and year	Frequency basis	Assessment method	Strengths	Limitations
					• Breadth vocabulary knowledge • Only recognition
Word Part Levels Test	Sasao and Webb (2017)	British National Corpus	Discrete-point test	Both interactive and print formats	• Only receptive knowledge • Only single words • Form and meaning (no use) • Decontextualized words • No translation (monolingual) • Depth vocabulary knowledge • Only recognition
Guessing from context test	Sasao and Webb (2018)	n/a	Integrative test	• Both interactive and print formats • Single words and MWUs • Contextualized words and MWUs • Both recognition and recall	• Only receptive knowledge • Form and meaning (no use) • No translation (monolingual) • Breadth vocabulary knowledge

Test	Author(s) and year	Frequency basis	Assessment method	Strengths	Limitations
California Verbal Learning Test for Children	Delis et al.(1994)	n/a	Integrative test	• Both receptive and productive knowldge • Form, meaning and use • Both recognition and recall	• Only print format • Only single words • Decontextualized words • No translation (monolingual) • Breadth vocabulary knowledge
Vocabulary test	González-Fernández (2022)	n/a	Discrete-point test	• Both receptive and productive knowldge • Contextualized words • Translation (bilingual) • Both recognition and recall	• Only print format • Only single words • Form and meaning (no use) • Breadth vocabulary knowledge

In light of the insights presented in Table 2 and the limitations identified in existing vocabulary assessments, a new vocabulary test was developed for this research. This test aims to address critical gaps in current instruments, particularly concerning the assessment of MWUs across the three dimensions of vocabulary knowledge: form, meaning, and use. A detailed account of the test's design, structure, and validation is provided in Chapter 3.

2.1.2 Vocal Training

Vocal training occupies a central role in music education and performance, yet it remains significantly underrepresented in empirical research compared to instrumental training. While an extensive body of literature has examined the neural and cog-

nitive adaptations associated with musical training (Bengtsson et al., 2005; Hyde et al., 2009; Kölsch et al., 2005; Moreno et al., 2009; Oechslin et al., 2009; Ross et al., 2003; Schlaug et al., 2009; Trainor et al., 1999; Wan & Schlaug, 2010; Zatorre et al., 2007), much of this research has treated musicians as a uniform group, primarily focusing on instrumentalists (Tervaniemi et al., 2009).

Despite methodological imbalances in the literature, vocal and instrumental training share foundational characteristics. Both practices engage sensory-motor systems by requiring close coordination between auditory perception and fine motor control. As Segado et al. (2018, p. 2) observe, "playing musical instruments and singing both result in musical pitch patterns by integrating auditory perception with fine motor control." Similarly, Zarate (2013) classified both as sensory-motor training forms, highlighting the dynamic feedback loops between the movement planning and auditory input involved in each.

Pedagogically, the role of vocalization extends across musical disciplines. Wallace (2014) proposed that musical thought often begins as internal vocalization—musical imagery—before it is externalized through voice or instrument. This aligns with Gordon's (1988) argument that singing supports the internalization of melodic information, a principle widely applied in instrumental music education (Schleuter, 1997). Empirical studies support this pedagogical stance: Elliott (1974), Coveyduck (1998), and Dunlap (1989) found that singing improves pitch discrimination, tonal memory, and the ability to translate between aural and notational representations. These findings establish singing not merely as a skill but as a cognitive gateway to the development of oneself as a musician.

While these shared mechanisms suggest pedagogical overlap, vocal and instrumental training also entail significant differences—neurologically, physically, and experientially. Tervaniemi et al. (2009) emphasized that musical expertise varies with the specific cognitive and sensory-motor demands of different instruments, including the human voice. This perspective is substantiated by neuroscientific research: Segado et al. (2018) compared singers and cellists and found overlap in the activation of their auditory-vocal network—including the superior temporal gyrus (STG), anterior insula, and cerebellum—but also noted crucial differences in feedback mechanisms. Vocalists rely more heavily on auditory feedback and kinesthetic awareness of internal vocal muscles, while instrumentalists engage primarily with tool-mediated motor control (Raphael et al., 2007).

These divergences are reflected in neuroplastic adaptations. Instrumentalists typically exhibit higher fractional anisotropy in the arcuate fasciculus, a white matter tract involved in auditory-motor integration—suggesting stronger structural connectivity for externally guided actions. In contrast, singers show lower anisotropy in this

region, interpreted as a marker of greater flexibility in vocal-motor integration (Halwani et al., 2011; Erdemir & Rieser, 2016). This distinction is echoed in electroencephalography (EEG) studies, which show that musical instruction, even in early stages, produces measurable changes in neural activity patterns (Pantev et al., 2001; Schulz et al., 2003; Fujioka et al., 2006).

From a performance perspective, vocal training activates multiple overlapping systems, engaging real-time sensory monitoring, breath control, and vocal proprioception. These demands contribute to strengthened connectivity between temporal, frontal, and sensorimotor brain regions (Kleber et al., 2010). The arcuate fasciculus, which links Broca's and Wernicke's areas, plays a central role in vocal-motor integration (Brown et al., 2004; Levitin & Menon, 2003; Ozdemir et al., 2006; Pantev et al., 1998). While instrumentalists also recruit this network, a singer's direct engagement of their body as an instrument appears to deepen these neural linkages (Lotze et al., 2007).

This embodiment of sound production is another distinguishing feature. Wallace (2014) documented how conservatory-trained instrumentalists participating in choral rehearsals reported heightened awareness of their breath, bodily tension, and expressive control. One pianist remarked, "We make the sound with our body directly through our voice," while a violist commented on the psychological intensity of using the whole body as an instrument. Garnett (2005) similarly emphasized that singing reshapes bodily awareness, promoting transformation, presence, and self-expression in musical performance.

Vocal training was selected as the focus of this study not only for its neurocognitive distinctiveness but also for its pedagogical and methodological advantages. Unlike instrumental training, singing does not require specialized equipment or formal instruction to produce simple musical structures. As Tourville et al. (2008) explain, singing and speech share overlapping neural circuits, enabling individuals to imitate musical patterns in ways similar to language acquisition. This makes vocal training especially accessible and adaptable for empirical research, particularly in classroom contexts and for learners with varied musical backgrounds. Furthermore, the integration of auditory, motor, cognitive, and embodied systems in vocal training supports a multifaceted learning experience—one that aligns with music education's broader goals of fostering expressive, reflective, and inclusive musicianship. By foregrounding the voice as a primary musical instrument, this study seeks to illuminate how vocal training may support MWU learning.

2.1.3 Well-Being

Music elicits profound emotions, ranging from aesthetic pleasure to relief from monotony, which can modify emotional states, attitudes, and motivational levels (Overmann, 2005; Livesey et al., 2012; Sloboda, 1985). In the context of language education, affective factors—particularly foreign language anxiety and apprehension—are known to hinder learners' ability to engage effectively with learning materials (Dewaele & Alfawzan, 2018; Getie, 2020; Passiatore et al., 2019; Russell, 2020; Tomczak & Lew, 2019) and to reduce language development and communicative confidence (Bonilla-Salazar, 2019; MacIntyre & Gardner, 1991). Responding to these challenges, a growing body of research highlights music's capacity to reduce foreign language anxiety and lower students' affective filters (Bare & Dundes, 2004; Cooke et al., 2005; Dolean, 2015; Pelletier, 2004; Schöpp, 2001; Weeks & Nilsson, 2010), enhance motivation, and foster a positive learning environment (Arnold & Herrick, 2017; Bostrom & Sandberg, 2009; Claerr & Gargan, 1984; Dolean, 2016; Dolean & Dolean, 2014; Henry et al., 2018; Horwitz et al., 1986; Jolly, 1975; Nipattamanon, 2018; Paquette & Rieg, 2008; Shen, 2009; Werner, 2021a).

One of the earliest pedagogical approaches to using music for emotional support in language learning was developed by Georgi Lozanov (1978). His method, Suggestopedia, centered on the use of music-induced "pseudo-passivity" or "psycho-relaxation," which he described as a relaxed yet alert mental state that activated subconscious cognitive processes. According to Lozanov, while learners may appear physically passive, music fosters internal engagement—triggering associations, emotional responses, and imagery that support language learning without inducing mental fatigue. In controlled trials, learners taught with music-enriched suggestopedic methods not only retained significantly more vocabulary than those taught via conventional methods but also reported reduced symptoms of stress, such as headaches, anxiety, and irritability.

Building on this foundation, Krashen (1983, 1985a, 1985b) situated Lozanov's insights within his affective filter hypothesis, which posits that second language acquisition occurs most effectively when input is comprehensible and processed in a low-anxiety, high-motivation context. Within this framework, music functions as a catalyst for what Krashen called "super-learning"—a state in which engaging, emotionally safe environments allow input to bypass affective barriers and reach the subconscious. Krashen also emphasized that acquisition is non-linear and subconscious, supported not by deliberate memorization, but by meaningful interaction in emotionally resonant contexts. His view has been further supported by researchers who have explored music's capacity to lower affective filters and increase

receptivity to language input (Coe, 1972; Claerr & Gargan, 1984; Kanel, 1997; Merriam, 1964; Meyer, 1956; Stoudenmire, 1975; Wilcox, 1995).

The cognitive benefits of music further strengthen its relevance to vocabulary learning. Baur (1990), for instance, suggested that music can induce an "alpha state"—a relaxed yet alert neurological condition that enhances right-hemisphere integration, which is associated with memory, intuition, and creative learning. Building on this, De Groot (2006) found that students learning vocabulary in the presence of background music (specifically Bach concertos) scored higher on recall tasks than peers in silent conditions. Similar findings were observed by Thiessen and Saffran (2009) in infants, who demonstrated enhanced recognition of lyrics and melodies when exposed to them in sung, rather than spoken, form. Schellenberg and Weiss (2012) brought a psychological perspective to this discussion, suggesting that music primarily supports learning by improving emotional state. This improved mood, in turn, facilitates cognitive functions such as attention, working memory, and executive control.

Recent findings from neuroscience add further support to this view. Music activates the brain's reward system via the cortico-striatal circuit, leading to dopamine release in the caudate during anticipation and in the nucleus accumbens during peak emotional responses (Blood & Zatorre, 2001; Salimpoor et al., 2011, 2013). These dopaminergic responses have been associated with enhanced motivation, attention, and memory consolidation (Berridge & Robinson, 1998; Redgrave et al., 1999; Ripollés et al., 2016, 2018; Schultz, 2016). Functional imaging studies, including those using transcranial magnetic stimulation (TMS), blood oxygen level-dependent (BOLD), and functional magnetic resonance imaging (fMRI), have also shown that music engages the dorsolateral prefrontal cortex-an area involved in decision-making and executive function (Dowdle et al., 2018; Ko et al., 2008; Pogarell et al., 2006, 2007; Strafella et al., 2001). Music also stimulates emotional processing in the left frontal and anterior temporal cortical regions (Altenmüller et al., 1997). Furthermore, auditory training with music has been shown to rapidly alter neural networks, leading to enhanced sensorimotor integration and more efficient cortical communication (Altenmüller et al., 2000). These changes are critical not only for music processing but also for broader cognitive functions that support language acquisition.

Taken together, this interdisciplinary body of research demonstrates how music promotess well-being through emotional regulation, motivational engagement, and cognitive enhancement. These mechanisms create favorable conditions for language learning—particularly for MWU learning, which require a relaxed, attentive, and emotionally supported learning context. This relationship between music-in-

duced well-being and MWU learning is central to the second research question addressed in this research.

2.1.4 Involuntary Musical Imagery

Involuntary Musical Imagery (INMI), often referred to as "earworms," is a phenomenon in which fragments of music or even whole songs repeat in one's mind without conscious effort after exposure (Beaman & Williams, 2010; Floridou et al., 2015). The term "earworm" is derived from the German word *Ohrwurm* (Eckert, 1979; Hemming, 2009), and alternative descriptors include "stuck song syndrome" (Levitin, 2006), "cognitive itch" (Kellaris, 2001), "sticky tunes" (Williamson et al., 2014), and "brain wormer" (Sacks, 2007). For the purposes of this study, the term INMI is adopted as the working definition, reflecting its characterization as an involuntary but ubiquitous mental event (Janetschek et al., 2023; Liikkanen, 2012a, 2012b, 2012c; Müllensiefen et al., 2014).

INMI is understood as a non-pathological, non-intrusive mental experience that differs from clinical auditory hallucinations (Liikkanen, 2012a) and other cognitive phenomena such as mind-wandering (Floridou & Müllensiefen, 2015) or obsessive thoughts (Hyman et al., 2013). INMI is defined by its spontaneous onset and persistence, as well as its repetitive nature—distinguishing it from one-off occurrences of musical recall, referred to as "musical mind pops" (Elua et al., 2012). To ensure age-appropriate communication with younger learners, the term "Song Stuck in My Mind Phenomenon" (SSIMHP), coined by Murphey (1990b), will be used in research instruments (post-intervention questionnaire) and participant discussions.

A foundational body of work in music psychology has investigated the frequency, triggers, and individual differences associated with INMI. Liikkanen's (2012a) large-scale survey of over 11,000 Finnish participants revealed that 91.7% experienced INMI at least once a week, with higher frequencies among women and individuals with previous musical training. However, findings remain mixed regarding the types of music most likely to trigger INMI. While Liikkanen (2012a) found higher induction rates for contemporary pop songs, Hyman et al. (2013) reported no significant differences between modern and classic tracks. Similarly, the role of lyrics in triggering INMI remains contested: Sacks (2007) downplayed their impact, whereas Halpern and Bartlett (2011), Liikkanen (2012a), and Floridou et al. (2017) found that lyric-based music was more likely to induce the phenomenon. This may be due to the strong mnemonic value of lyrics when paired with melody, particularly for expert singers (Ginsborg & Sloboda, 2007), and the likelihood of sing-along be-

havior, which is believed to increase both the frequency and duration of INMI (Williamson & Müllensiefen, 2012).

Beyond its cognitive and psychological significance, INMI has emerged as a relevant construct in educational contexts, particularly in relation to language acquisition. Early educational research by Barber (1980) introduced the concept of "DIN" (deep internalization) to describe involuntary mental rehearsal processes that occur after listening to music in a foreign language context. Krashen (1983) expanded on this idea, suggesting that DIN reflects the activation of Chomsky's Language Acquisition Device, initiated by comprehensible input and enhanced by internal repetition. According to Krashen, INMI signals that language acquisition is occurring naturally and subconsciously. Supporting this view, Bedford (1985), Parr and Krashen (1986), and de Guerrero (1987) found that 74% of surveyed language learners experienced DIN, suggesting its widespread prevalence. While some studies found DIN to be more common among beginners (Parr & Krashen, 1986), others observed a slight increase among more advanced learners (de Guerrero, 1987).

Murphey (1990b) expanded the concept by proposing that DIN is most effectively triggered through music and singing, thus introducing SSIMHP as a musically induced form of DIN. While DIN is contingent on comprehensible input and typically requires extended exposure, SSIMHP can be triggered almost immediately and does not rely on comprehension, making it particularly effective for early-stage learners. Moreover, SSIMHP may persist in memory for years, as evidenced by McChesney (1985), who noted that adults could recall singing games from childhood. Unlike DIN, which fades over time, SSIMHP endures due to repetitive lyrics and catchy melodies.

Subsequent empirical studies support this distinction. Calvert and Tart (1993) found that sung input, particularly when repeated over time, led to significantly higher recall than spoken input. Similarly, Wilcox (1996) argued that the lingering presence of music in the mind prolongs rehearsal time, thus supporting vocabulary retention. Music's repetitive structure and melodic patterns extend the timeframe for mental engagement with language, enhancing articulatory rehearsal within the phonological loop (Baddeley & Hitch, 1974). Similarly, Tomczak and Lew (2019) emphasized that repeated rehearsals—whether overt (singing aloud) or covert (subvocalization)—can significantly improve phonological processing. This view is reinforced by more recent studies (Ludke & Good, 2020; Mary, 2022; McQuillan & Rodrigo, 1995; Nambiar, 1993; Rainey & Larsen, 2002; Salcedo, 2002; Salcedo & Harrison, 2002), which consistently found that music-based conditions outperform immersion-only settings (without music) for vocabulary recall. These findings under-

score music's potential not only to engage learners emotionally but also to trigger automatic mental rehearsal mechanisms which can enhance vocabulary acquisition.

Taken together, this interdisciplinary body of research demonstrates the potential of INMI as a mechanism for implicit rehearsal and acquisition in MWU learning. Its ability to spontaneously re-activate MWUs in learners' minds, especially when facilitated by music, offers valuable insights into vocabulary acquisition processes. The relationship between INMI and MWU learning is central to the third research question explored in this study.

2.1.5 Neuroscientific and Cognitive Foundations of Music-Based Vocabulary Learning

This section provides a comprehensive overview of how neuroscientific and cognitive findings inform the potential of music—particularly vocal training—as a tool for enhancing MWU learning. It integrates four core perspectives: the general mechanisms of learning and vocabulary storage in the brain, the specific cognitive advantages associated with musical training, the shared neural architecture underlying music and language processing, and the cognitive processes involved in music-based learning. Together, these sections establish a strong theoretical and empirical foundation for understanding how and why a music-based approach, especially vocal training, can support the MWU learning.

2.1.5.1 Neural Foundations of Vocabulary Learning

This section outlines the neuroscientific foundation for the present research by addressing two key dimensions: first, how learning occurs at the neuronal level, and second, how vocabulary is acquired and stored in the *mental lexicon*[3]. Understanding these processes informs the rationale of the present study, which explores how vocal training may support MWU learning by drawing on neurobiological and emotional mechanisms. This focus is essential, as it recognizes that vocabulary is not processed or stored as isolated words, but rather as word sequences embedded in meaningful contexts (MWUs). Moreover, it highlights the significant role of affective factors in shaping vocabulary acquisition and retention, thus positioning emotional engagement as a critical component of vocabulary learning.

From a biological and neuroscientific perspective, learning involves the formation and reinforcement of neuronal networks within the brain, particularly in the

[3] The mental lexicon refers to the internal mental system where words and multi-word units are stored and organized in associative networks (Aitchison, 2003; Hutz & Kolb, 2010; Lewis, 2008). Its structure remains theoretical, as it cannot be directly observed in the brain (Schmitt, 2000; Haudeck, 2008).

cortex (Bleyhl, 2004; Grein, 2013). Neurons establish connections via synapses, which enable the transmission of information through electrical and chemical signals (Arndt & Sambanis, 2017). Two essential mechanisms underlie learning at the synaptic level: synaptic plasticity and metaplasticity. Synaptic plasticity refers to the brain's capacity to strengthen neural connections in response to experience, while metaplasticity describes how prior learning experiences modulate the brain's future learning potential (Strait & Kraus, 2014; Beck et al., 2016; Böttger & Sambanis, 2016).

The learning process can be conceptualized through the Level of Processing Hypothesis (Craik & Lockhart, 1972), which views memory not as compartmentalized stores but as a continuum influenced by the depth of information processing. Learning generally progresses through three phases: sensory intake, encoding, and consolidation into long-term memory. In the sensory phase, information is registered through perceptual systems, with sensory memory briefly holding exact replicas of stimuli (Shiffrin, 1999). During encoding, information is processed in working memory. Baddeley and Hitch (1974) proposed three key components: the central executive, the visuospatial sketchpad, and the phonological loop. The latter is particularly relevant to vocabulary learning, as it temporarily stores and rehearses verbal input (Ellis, 2001; Repovš & Baddeley, 2006). In the consolidation phase, encoded information is transferred to long-term memory. A critical component that links these memory systems is the episodic buffer, which integrates information from the sensory register, working memory, and long-term memory into cohesive units (Baddeley, 2000; Baddeley et al., 2009). This process strengthens neuronal representations via rehearsal, enabling the gradual embedding of learned content into existing networks (Atkinson & Shiffrin, 1968; Sambanis & Walter, 2019). This integrative function plays a central role in vocabulary acquisition, especially when dealing with larger linguistic structures such as MWUs, which are stored as unified memory chunks.

Building on this cognitive framework, vocabulary learning is understood as the encoding, storage, and retrieval of lexical items within the mental lexicon—often conceptualized as the brain's "wordstore" (Aitchison, 2003; Hulstijn, 1997). Crucially, vocabulary is not stored as isolated units but embedded within rich associative networks composed of collocations, idioms, and other MWUs. These lexical chunks are stored and accessed as single units, increasing processing efficiency and supporting fluent language production (Hutz & Kolb, 2010; Lewis, 2008).

The dynamic nature of the mental lexicon is reflected in research highlighting the cumulative and self-reinforcing structure of vocabulary knowledge. Hutz (2013) observed that the more MWUs learners acquire, the easier it becomes to incorporate

new lexical items—suggesting a scaffolding process that builds upon existing lexical patterns. McCarthy (1990) similarly emphasized that vocabulary development involves the integration of new items into prior lexical networks, often requiring the reorganization of established knowledge structures. This view is supported by Kircher et al. (2009), who found that the efficiency of lexical encoding depends both on learners' existing knowledge and the perceived meaningfulness of incoming language input. From a neurocognitive perspective, Wolfe (2010) demonstrated that the frequent activation of existing neural patterns strengthens synaptic connections, while Arndt and Sambanis (2017) showed that repetition combined with emotional engagement further stabilizes these connections—promoting long-term retention. Together, these findings underscore the pedagogical value of teaching vocabulary through context-rich, meaningful combinations such as MWUs, which align with the brain's preference for structured and familiar linguistic sequences.

Emotions also play a crucial role in the vocabulary learning process. Emotionally salient content activates key regions of the limbic system—particularly the amygdala, hippocampus, and nucleus accumbens—which are central to memory formation (Grein, 2013; Friedrich & Press, 2002; Vinzentius, 2007). Positive affect stimulates dopamine release, which boosts motivation, attention, and memory consolidation (Squire & Kandel, 1999), while negative emotional states such as anxiety can hinder memory access and cognitive flexibility (Spitzer, 2010). Grein (2013) stressed the need to emotionally engage the limbic system to ensure that new stimuli are effectively processed and transferred to cortical regions for retention and consolidation.

This emotional-neural interface is particularly relevant to the present study, which investigates the potential of a music-based approach to enhance learners' well-being (research question 2) in comparison with a non-music-based approach. Music's inherent emotional power and ability to sustain learner engagement may activate the same neurological pathways involved in emotional memory and language processing. By situating MWU learning within an integrated framework of cognitive and affective neuroscience, this study aims to contribute to more holistic, brain-informed strategies for vocabulary instruction.

2.1.5.2 Neural Foundations of the Musician Advantage

Musical training, particularly when initiated early and pursued consistently, induces substantial structural and functional changes in the brain (Altenmüller, 2003; Hyde et al., 2009; Moreno et al., 2009; Pantev et al., 2012; Schlaug et al., 1995b, 2005; Strait & Kraus, 2014). These structural and functional changes—commonly referred

to as *musical advantage*—are not the result of innate predisposition—which has been erroneously assumed for many years—but arise from sustained musical training (Altenmüller, 2003; Hyde et al., 2009; Moreno et al., 2009; Pantev et al., 2012; Schlaug et al., 1995b, 2005; Strait & Kraus, 2014).

Structurally, musicians show increased volume in several brain regions linked to language and auditory processing, including the planum temporale (PT) (Keenan et al., 2001; Schlaug et al., 1995a; Zatorre et al., 1998), corpus callosum (Bengtsson et al., 2005; Schlaug et al., 1995a; Schmithorst & Wilke, 2002), and Heschl's gyrus (HG) (Luders et al., 2004; Schneider et al., 2002). Enhanced cortical connectivity is supported by more robust white matter tracts (Halwani et al., 2011; Lee et al., 2003), and increased gray matter volume has been observed in auditory and motor regions, including the inferior frontal gyrus, inferior lateral temporal lobe, and cerebellum (Amunts et al., 1997; Bermudez et al., 2009; Gaser & Schlaug, 2003; Hutchinson et al., 2003; Imfeld et al., 2009; Pantev et al., 1998; Schug et al., 1998; Schneider et al., 2005).

Functionally, musicians demonstrate greater activation in auditory and language-related regions such as Broca's and Wernicke's areas (Bangert et al., 2006). They also exhibit faster and more accurate responses to auditory stimuli and enhanced mismatch negativity (MMN) responses to rule violations, reflecting superior pattern recognition and attentional capacities (Herholz et al., 2009, 2012; van Zuijen et al., 2004, 2005). These adaptations are foundational to the improved processing of phonological information critical to vocabulary acquisition.

Auditory acuity is a hallmark of the musician advantage. Musicians demonstrate lower pitch discrimination thresholds (Bidelman & Krishnan, 2010; Kishon-Rabin et al., 2001; Spiegel & Watson, 1984; Strait et al., 2010), superior frequency and duration discrimination (Kölsch et al., 1999; Tervaniemi et al., 2006), and increased sensitivity to melodic contour (Fujioka et al., 2004; Trainor et al., 1999). They can detect subtle shifts in pitch, rhythm, and harmony and exhibit superior timbre and vocal tone discrimination (Chartrand & Belin, 2006; Tervaniemi et al., 2005; Zarate, 2013). These perceptual enhancements support the stable mental representation of musical and linguistic information (Janata & Grafton, 2003; Schön & François, 2011).

Musical training is consistently linked to enhanced linguistic processing. Research shows strong associations between musical aptitude and language skills, with both melodic (Anvari et al., 2002; Forgeard et al., 2008; Lamb & Gregory, 1993; Loui et al., 2011) and rhythmic abilities (Huss et al., 2011; Moritz et al., 2013; Overy et al., 2003; Strait et al., 2011a; Wolff, 2002) contributing to phonological development. Developmental studies demonstrate that musical training enhances language

skills in both children and adults (Lorenzo et al., 2014; Moreno & Besson, 2006; Patel & Iversen, 2007; Tierney & Kraus, 2013). Musicians show superior perception and production of L2 speech sounds (Milovanov et al., 2008, 2010; Slevc & Miyake, 2006), stronger perceptual sensitivity to lexical tones and prosodic variation (Marie et al., 2010; Marques et al., 2007; Wong et al., 2007b), and increased responsiveness to syllabic tone changes in foreign languages (Martínez-Montes et al., 2013). These enhancements are further supported by more robust neural encoding of tonal and prosodic information (Alexander et al., 2005; Delogu et al., 2010; Lee & Hung, 2008).

Memory is another domain significantly shaped by musical training. Children with musical experience show stronger verbal recall (Ho et al., 2003), and university students who began training early demonstrate significantly greater working memory (Franklin et al., 2008; Chan et al., 1998; Jakobson et al., 2003). These benefits are positively associated with both training duration and age of onset (Brandler & Rammsayer, 2003; Jentschke, 2018 in Sambanis & Böttger, 2018). The Speech Learning Model (Flege, 1995) offers a theoretical explanation, proposing that improved phonological encoding underlies these memory advantages. Crucially, these gains appear domain-specific, with no comparable improvements for example in visual memory among trained musicians (Ho et al., 2003).

Neurophysiological studies confirm that musicians outperform non-musicians in auditory learning and attention, as reflected in enhanced N1 and P2 responses—markers of early sound discrimination—and P3 responses, which reflect attentional processing (Seppänen et al., 2012a, 2012b). These neural enhancements align with superior academic outcomes among music-trained children, who outperform peers in vocabulary, reading comprehension (Swaminathan & Gopinath, 2013), and broader academic subjects such as mathematics and language (Catterall et al., 1999; Spychiger, 2001; Vaughn, 2000; Upitis & Smithrim, 2001).

At the cortical and subcortical levels, musical expertise supports speech-in-noise perception and fine-grained auditory categorization (Marie et al., 2011; Marques et al., 2007, 2009; Musacchia et al., 2008; Sadakata & Sekiyama, 2011; Wong et al., 2007a). These effects are attributed to the demands of musical pitch processing, which develop auditory precision (Herholz & Zatorre, 2012; Kraus & Chandrasekaran, 2010; Patel, 2011). Furthermore, musical and linguistic experiences jointly influence neural processing of speech at multiple levels (Callan et al., 2003; Ahissar et al., 2009), supporting broader language abilities such as reading and speech perception (Banai et al., 2009; Parbery-Clark et al., 2009).

Importantly, studies suggest a causal relationship between music and language development. Moreno et al. (2011) found that preschoolers who received only 20

days of music training showed measurable vocabulary gains, while those receiving visual arts instruction did not-highlighting music's unique impact. These findings align with broader evidence that musical training improves semantic processing (Dittinger et al., 2016), phonological skills (Bhide et al., 2013), duration cue perception (Chobert et al., 2014), and general L2 learning.

Finally, musical training enhances synaptic plasticity and facilitates the temporal synchronization of neuronal assemblies (Wan & Schlaug, 2010), improving short- and long-term learning. The structured and emotionally engaging nature of music facilitates deeper memory encoding, which is essential for both the retention of MWUs and emotional engagement in language learning. In summary, the musician advantage stems from rigorous and sustained musical training rather than innate predisposition. The resulting structural and functional brain adaptations—especially those related to auditory processing, memory, and emotional regulation—provide strong neuroscientific and pedagogical justification for incorporating vocal training into language education and educational curricula.

2.1.5.3 Neural Overlap Between Music and Language Processing

This section explores the shared neural architecture underlying music and language processing and considers the implications for language learning. Moving from early views of hemispheric specialization to contemporary models of neural integration, the chapter synthesizes neuroscientific and theoretical evidence supporting the use of vocal training in second language instruction.

Recent advancements in neuroscience have significantly deepened the understanding of the neural architecture underlying both music and language processing. These suggest that music and language engage shared and distributed neural networks, particularly in the temporal and frontal cortices (Kölsch et al., 2000, 2002; Liegeois-Chauvel et al., 1998; Maus et al., 2001; Patel et al., 1998; Peretz et al., 1994; Wallin et al., 2000; Zatorre et al., 1994).

Early research indicated a hemispheric specialization, with the left temporal lobe attuned to fine-grained temporal analyses (e.g., phonological and syntactic processing) and the right temporal lobe more responsive to spectral variations (e.g., pitch and tonality) (Friederici & Alter, 2004; Zatorre & Belin, 2001; Zatorre et al., 2002). This suggested a dichotomy in processing, with speech predominantly left-lateralized and music right-lateralized. While hemispheric division was widely accepted, subsequent studies have questioned it, showing that language comprehension is more diffusely distributed within the left hemisphere, extending beyond Broca's and Wernicke's areas (Vigneau et al., 2006), and that the right hemisphere also contributes to

language perception and comprehension (Federmeier et al., 2008). This bilateral and interconnected processing architecture implies that brain regions which are traditionally associated with syntax in language—such as Broca's area—are also involved in processing musical syntax (Kölsch et al., 2000, 2002; Patel et al., 1997). For instance, Patel et al. (1997) found that irregular rhythmic patterns elicited significant activation in the left inferior frontal gyrus (Broca's area), suggesting that this region may handle syntactic regularities in both music and language. Such cross-domain activation challenges domain-specific views and supports a more integrative model of auditory and syntactic processing (Levitin & Menon, 2003).

Music processing has been shown to activate not only the left inferior frontal gyrus (IFG) but also Wernicke's area, the superior temporal gyrus (STG), Heschl's gyrus (HG), and the planum temporale (PT)—all regions associated with language comprehension (Levitin & Menon, 2003; Vuust et al., 2006). Gruhn and Altenmüller (1997) similarly emphasized that music-based learning recruits a broad, bilateral neural network, highlighting its potential for cognitive transfer across domains. Supporting this, Patel (2008) and Slevc and Okada (2015) confirmed that cognitive control mechanisms involved in music and language processing are distributed across both the left and right frontal cortices, reinforcing the view that music engages integrated and domain-general brain systems.

Further neuroimaging studies have clarified the specialized roles of these networks. Merrill et al. (2012), for example, found that the IFG and intraparietal sulcus (IPS) contribute to both speech and song processing: the left IFG is dominant in spoken word recognition and pitch discrimination in speech, whereas the right IFG plays a more prominent role in pitch processing during singing. The IPS was also shown to specialize in processing discrete musical pitches and intervals, in contrast to the continuous pitch contours of natural speech.

These findings underscore music's unique capacity to activate large-scale, bilateral neural systems, offering compelling pathways for holistic and multimodal learning. This overlap is particularly relevant in vocal performance, where speech and melody converge. Singing and vocal training inherently engage both hemispheres: rhythm, prosody, and speech production are primarily processed in the left hemisphere, while pitch and tonal structure are associated with right-hemisphere functions (Borchgrevink, 1982; Sommer, 2016, as cited in Sambanis & Böttger, p. 312). Thus, vocal training emerges as a powerful pedagogical tool, capable of enhancing linguistic and musical competence through coordinated hemispheric activation.

Despite converging evidence, the field continues to grapple with contradictory findings from neuroimaging research. On the one hand, several fMRI studies confirm

the involvement of language-related regions during music processing (Kölsch et al., 2002; Kunert et al., 2015; Levitin & Menon, 2003; Schön et al., 2010; Tillmann et al., 2003). On the other hand, some studies report dissociations, suggesting that music and language may rely on distinct but parallel neural modules (Patel et al., 2008; Peretz, 1993; Peretz et al., 1994; Piccirilli et al., 2000). These discrepancies have prompted further investigation, and recent advances in neuroimaging techniques—such as PET, fMRI, MEG, EEG, and ERP—have improved spatial and temporal resolution, helping to clarify many of these complexities. As a result, an increasing number of studies now support a significant degree of overlap in the neural substrates underlying music and language processing (Sammler et al., 2007; Rogalsky et al., 2011; Schulze et al., 2011; Wong et al., 2007a, 2007b). In this context, Strait and Kraus (2011b) argue that although domain-specific cortical specializations for music and speech exist (Brown et al., 2006; Rogalsky et al., 2011; Zatorre et al., 2002), converging evidence points to shared cortical mechanisms for processing auditory information across both domains (Kölsch et al., 2002; Patel, 2003; Rogalsky et al., 2011; Zatorre & Gandour, 2008).

To explain the observed neural overlap, Patel proposed two theoretical frameworks: the OPERA hypothesis and the Shared Syntactic Integration Resource Hypothesis (SSIRH). Both are grounded in evidence that musical training leads to anatomical and functional changes in the brain, reflecting cross-domain plasticity (Amunts et al., 1997; Bengtsson et al., 2005; Bermudez et al., 2009; Elbert et al., 1995; Gaser & Schlaug, 2003; Hutchinson et al., 2003; Keenan et al., 2001; Luders et al., 2004; Pantev et al., 1998; Patel & Balaban, 2001; Schmithorst & Wilke, 2002; Schneider et al., 2002, 2005). To systematically explain this phenomenon, Patel (2011) introduced the OPERA hypothesis, which predicts that musical training can enhance the neural encoding of speech under five specific conditions: Overlap, Precision, Emotion, Repetition, and Attention. Each component specifies a critical mechanism. Overlap refers to shared acoustic features—such as pitch and timing—that engage common neural substrates in both speech and music processing. Precision emphasizes the heightened acoustic discrimination required by music, particularly for pitch, which fosters refined neural processing that can benefit speech perception. Emotion, Repetition, and Attention are cognitive-affective dimensions that contribute to sustained engagement and reward-driven learning, further promoting neural plasticity.

Notably, music is deeply intertwined with emotional experience and dopamine release (Salimpoor et al., 2013), making it a powerful source of intrinsic reward. As Patel (2014) notes, "Music links intricately structured sound to biological rewards, and rewards have consequences for auditory neural plasticity" (p. 102).

Likewise, musical training involves extensive repetition—often through the iterative practice of complex passages—which mirrors massed practice, a well-established method for reinforcing synaptic connectivity and long-term retention (Taub et al., 2002). Focused attention, also essential to musical training, has been shown to modulate auditory cortical responses and drive plastic changes in the brain (Polley et al., 2006). For example, Wolfe and Noguchi (2009) demonstrated that music enhances auditory attention in young learners, enabling them to better filter distractions and focus on linguistic input.

Building upon the OPERA framework, Patel also proposed the Shared Syntactic Integration Resource Hypothesis (SSIRH), which accounts for the structural parallels between music and language at the level of syntactic processing (Patel, 2003, 2011). While music and speech activate distinct neural populations, these populations are located within overlapping cortical areas. The SSIRH posits that music and language rely on a shared set of cognitive resources to organize temporally unfolding sequences—such as musical phrases or syntactic constructions-into coherent structures (Tallal & Gaab, 2006; Peretz et al., 2015). This supports the idea that engagement with musical syntax, especially through singing and vocal training, may strengthen the syntactic integration mechanisms also critical for processing MWUs in language.

Patel (2011) clarifies this perspective: "Envelope processing in speech and music utilizes overlapping brain networks. It is not required that such networks are entirely overlapping, simply that they overlap to a significant degree at some level of processing (e.g., subcortical, cortical, or both)" (p. 9). Similarly, Brown et al. (2006) wrote, "Music and language sit side-by-side in the brain" (p. 2800), with homologous regions likely performing complementary functions. Their research further suggests that the interaction between music and language occurs in an "interfacer area" within Brodmann area 22—a region of the superior temporal gyrus—forming an interleaved functional domain that facilitates simultaneous processing of both types of stimuli at a high spatial resolution. These shared networks are not limited to perception alone but also encompass motor and kinesthetic areas involved in vocalization, highlighting the embodied nature of both musical and linguistic production (Brown et al., 2006, p. 2279). Recent work on brain hubs—highly connected, metabolically active nodes—adds further support. These hubs integrate signals across sensory modalities and cognitive domains, including music and language (Yan & He, 2011; van den Heuvel & Sporns, 2013). Their dense connectivity explains observed co-activation and shared vulnerabilities across domains. These findings directly align with the earlier neuroimaging evidence discussed above, reinforcing the

premise that musical training—particularly in the vocal domain—may optimize the brain's sensitivity to linguistic patterns such as those found in MWUs.

A growing body of empirical research has since validated these frameworks, providing evidence from behavioral studies and neuroimaging experiments. For instance, Kölsch and Jentschke (2008) investigated working memory for both verbal and tonal information using fMRI. Their results revealed overlapping activation in key neural regions—such as the ventrolateral and dorsal premotor cortices (including Broca's area), the PT, the inferior parietal lobe, the anterior insula, subcortical structures (basal ganglia and thalamus), and the cerebellum—during the rehearsal of both speech and tonal sequences. These findings indicate that the rehearsal and storage of verbal and musical information rely on shared sensorimotor-related neural circuits, supporting Patel's notion of overlap and shared resource integration in music and language processing.

Additional evidence comes from Jentschke and Koelsch (2007), who explored transfer effects between musical and linguistic syntax processing in children. Their study showed that children with musical training exhibited enhanced neural sensitivity to violations of linguistic syntax, suggesting that musical training may reinforce domain-general syntactic processing abilities. Conversely, children with specific language impairment (SLI) failed to show an expected brain response to musical syntax violations—a response that was observed in children with typical language development. These findings underscore the bidirectional relationship between music and language: musical training appears to support syntactic processing in language, while deficits in language may coincide with impaired processing of musical structure. Taken together, such evidence points to a shared cognitive and neural infrastructure for music and language, as proposed in the SSIRH model.

Further support for this hypothesis comes from a growing body of research demonstrating that musical training enhances not only linguistic processing but also musical sound processing itself. Studies have shown that musical expertise sharpens neural responses to pitch, rhythm, and temporal structure, as evidenced by early findings from Pantev (1998), Kölsch et al. (1999), and Fujioka et al. (2004). These studies provide strong evidence that musical training promotes neuroplastic changes in the auditory cortex, leading to enhanced sensitivity and precision in auditory signal processing. This auditory sharpening sets the stage for cross-domain benefits in speech processing.

Indeed, several studies confirm that musicians exhibit enhanced performance across multiple levels of linguistic analysis. These include improved perception of prosody (Schön et al., 2004), syntactic structures in speech (Jentschke & Koelsch, 2009), speech segmentation (Patel & Daniele, 2003; Schön et al., 2008; François &

Schön, 2011), and consonant contrasts (Chobert et al., 2011). These enhancements are not limited to cortical processing but extend to the subcortical level, where musical experience improves the encoding of key acoustic features such as pitch, timbre, and timing in speech (Kraus et al., 2009). Such fine-grained auditory processing is foundational to vocabulary development, particularly in prosody-sensitive areas like MWU acquisition.

Summing up, the notion of fixed hemispheric specializazion is increasingly seen as inadequate. Humans seem to shift between cognitive modes depending on strategic demands, and the neural networks processing musical stimuli are distributed across both hemispheres (Altenmüller et al., 2000). While language perception is predominantly left-lateralized and music perception is typically right-lateralized, both domains rely on shared neural resources for structural and productive processes. This body of neuroscientific evidence provides compelling support for the rationale of the present study. Vocal training, by engaging overlapping systems for rhythm, pitch, prosody, and syntax, creates a cognitively rich context for MWU learning. Specifically, singing may facilitate MWU learning by strengthening common auditory, articulatory, and syntactic networks. These theoretical and empirical backgrounds justify the integration of music-based approach in vocabulary instruction, highlighting the potential of vocal training for MWUs development.

2.1.5.4 Cognitive Perspectives on Music-Based Vocabulary Learning

A substantial body of research underscores the positive impact of music and its core properties—such as rhythm, melody, harmony, dynamics, and form—on cognitive processes essential to vocabulary development. These musical elements have been found to enhance cognitive processing, improve vocabulary retention, and support overall language acquisition in both students with special needs and their peers (Botari & Evans, 1982; Isern, 1958; Jalongo & Bromley, 1984; McCarthy, 1985; Schuster & Mouzon, 1982).

Among these cognitive processes, attention and memory are particularly relevant. Wolfe and Noguchi (2009) demonstrated that young learners showed greater attentional focus, engagement, and improved comprehension when listening to musical stories compared to spoken versions—an effect that persisted even under varying levels of distraction. This ability of music to direct attention is also supported by the Dynamic Attending Theory (DAT), which posits that rhythmic beats create attentional focal points that enhance auditory processing. Similar mechanisms are found in speech, where stressed syllables guide attention to key moments in the

stream, thereby aiding phoneme segmentation and lexical access (Fotidzis et al., 2018).

Memory and verbal learning are also strongly supported by musical engagement, particularly in tasks requiring verbatim recall (Dowling et al., 2002; Thaut et al., 2005; Tillmann & Dowling, 2007; Wallace, 1994; Yalch, 1991). Psychological research consistently shows that music, especially the element of rhythm, facilitates rote memorization and the encoding and retrieval of verbal content (Borchgrevink, 1982; Deutsch, 1972; Palermo, 1978; Serafine et al., 1984). For instance, Rainey and Larsen (2002) found that individuals who learned proper names through song demonstrated significantly better recall and faster relearning than those who used speech alone. Studies isolating rhythm as an independent component have yielded similarly positive outcomes (Ryan, 1969; Shepard & Ascher, 1973; Staples, 1968; Weener, 1971), with the effects being especially strong when the material is meaningful for the learners (Glazner, 1976; Shepard & Ascher, 1973; Weener, 1971).

The connection between rhythm and memory is further illuminated by cognitive research into how music and language are processed when integrated in songs. Songs are composed of two primary components—music and text—which can be learned separately but engage a distinct cognitive mechanism when experienced together. The longstanding debate over whether speech and music in song are processed by integrated or separate neural systems (e.g., Thaut et al., 2005) underscores this complexity. Evidence suggests that learning lyrics within a song leads to a unified memory representation, where rhythm and melody structure the verbal input in ways that support recall.

Dowling (1973) was among the first to show that melodies are "chunked" in memory, similar to how verbal information is processed. Chunking refers to the cognitive grouping of discrete items into larger, more manageable units, enhancing encoding and retrieval. He argued that musical phrases created through rhythmic grouping facilitate memory retention. Billows (1975) similarly observed that foreign language learners often remember entire songs—even when unable to produce fluent speech in the target language—because melody, rhythm, and rhyme serve as potent mnemonic devices.

A range of empirical studies has validated this integrative effect. Morrongiello and Roes (1990) found that recognition of lyrics significantly improved when paired with their original melody, particularly among adults. McElhinney and Annett (1996) confirmed that learning through song improves recall as compared to spoken text, while Kelly and Rubin (1988) emphasized that rhythm provides a schematic structure that enhances verbal memory. Melody and rhythm act as scaffolds that or-

ganize language into musical phrases aligned with natural prosodic patterns (Wallace & Schulkind, 1997).

Purnell-Webb and Speelman (2008) demonstrated that sung text, especially with familiar melodies, enhances recall. Rhythm plays a central role by anchoring words to predictable temporal structures, reducing cognitive load (Bower, 1970). Wallace and Rubin (1991) further suggested that songs, through their rhythmic and structural constraints, limit alternative phrasings and thereby stabilize recall. Wallace (1994) also emphasized how melodic repetition reinforces memory by cueing line length, syllable count, and stress patterns.

Neurological findings support these cognitive mechanisms. Thaut et al. (2005) showed that musical learning organizes information temporally, chunking it into manageable units within a melodic-rhythmic framework. This structure supports the development of synchronized neural networks, enhancing timing precision and recall. The brain's distinct organization of musical versus spoken input suggests that music can reconfigure neural architecture—what has been described as music-induced brain plasticity.

Despite these benefits, some researchers caution against possible drawbacks. Calvert and Billingsley (1998) argued that melodies may divert children's attention from the meaning of lyrics due to competition for limited processing resources. Medina (2002) warned that introducing both new melodies and unfamiliar text may lead to cognitive overload. Racette and Peretz (2007) found that learning both melody and text simultaneously may hinder recall, especially when a forgotten line disrupts access to subsequent ones. Their findings are supported by Speelman et al. (2012), who noted that memory for song often relies on a linear sequence, making it vulnerable to disruption.

Beyond these core processes, music also influences cognition through emotional and motivational mechanisms. Emotional states modulate cognitive functions such as working memory, attentional flexibility, and problem-solving (Cassady et al., 2004; Isen & Labroo, 2003; O'Hanlon, 1981). Isen (2009) and Ashby et al. (1999) found that music-induced dopamine release enhances creativity, decision-making, and social interaction. This is echoed by Nadler et al. (2010) and Gold et al. (2013), who showed that pleasurable music activates the ventral striatum, a key component of the dopaminergic reward system. Individuals with higher dopamine efficacy tend to learn more effectively through positive reinforcement-demonstrating music's potential to influence motivational processing.

Lastly, music exerts indirect cognitive benefits by enhancing physiological readiness for learning. Charnetski and Brennan (1998) showed that exposure to Muzak's Environmental Music increased levels of Immunoglobulin A, a key immune

system marker, suggesting a stress-reducing, wellness-enhancing effect. Bancroft (1985) similarly found that music affects physiological parameters such as blood pressure, posture, respiratory rate, and pulse—all of which contribute to improved alertness, concentration, and cognitive performance.

Taken together, these findings present a compelling case for music's role in supporting vocabulary learning through cognitive pathways. Music fosters attention, strengthens memory, enhances emotional engagement, and creates an optimal internal state for learning. When rhythm, melody, and verbal content are strategically aligned, songs become powerful vehicles for vocabulary acquisition and long-term retention.

2.1.6 Learner Differences and Exposure Variables in Multi-Word Units Learning

This section reviews five core learner-related and contextual variables that are widely recognized in the literature as influencing the learning of MWUs: gender, L1 proficiency and bilingualism, exposure to English, exposure to pop songs, and musical training. These variables are grounded in empirical findings and theoretical models from second language acquisition, cognitive psychology, and music education. Together, they represent a multidimensional framework encompassing both internal learner characteristics and external exposure conditions that can shape vocabulary development in EFL contexts.

Gender has long been discussed in relation to academic performance, cognitive processing, and learning preferences. While gender is often considered a relevant factor in educational and cognitive outcomes, existing literature suggests that its influence is limited when examined in isolation. Empirical studies have consistently shown minimal effects of gender on academic performance in primary and secondary education (Faber, 2012; May 2006; Schwanke et al., 2015), particularly when controlling for other variables with greater explanatory power (Alabau et al., 2002; Kaushanskaya et al., 2011; Zaunbauer et al., 2009).

These findings are supported by neuroscientific evidence. Meta-analyses of functional magnetic resonance imaging (fMRI) studies reveal no systematic differences in cortical activation between males and females during language tasks (Sommer et al., 2004, 2008). Similarly, studies in music cognition have reported no gender-related differences in neural responses to musical syntax violations, as measured by event-related potentials (ERPs) (Kölsch et al., 2003a, 2003b). These findings suggest a high degree of neurofunctional similarity between genders in domains relevant to language and music processing.

The theoretical framework that best encapsulates these observations is the Gender Similarity Hypothesis (Hyde, 2005), which posits that males and females are more alike than different in most psychological and cognitive traits. This perspective challenges essentialist views that attribute educational and cognitive differences to innate gender characteristics, emphasizing instead the role of contextual and environmental influences. Halpern and LaMay (2000) further caution against overemphasizing gender differences, noting that such emphasis may inadvertently contribute to their reinforcement through self-fulfilling prophecies.

Although some studies acknowledge modest average differences in specific cognitive domains, these are neither universal nor immutable. Rather, emerging evidence highlights the brain's plasticity across the lifespan, demonstrating that cognitive traits are continuously shaped by environmental, social, and cultural experiences (Baez et al., 2017; Christov-Moore et al., 2014; Jäncke, 2018; Michalska et al., 2013). At the same time, the complex interplay of genetic, hormonal, and social factors in shaping gendered behavior and cognition remains incompletely understood, necessitating caution in attributing causality to gender alone.

On the other hand, from the biological and neuroscientific standpoint, numerous morphometric studies have reported structural differences in the brains of males and females, offering further nuance to the gender similarity perspective. Specifically, several investigations have highlighted incre ased gray matter concentration in female brains in regions associated with language processing—such as the posterior temporal lobes, Heschl's gyri, and the planum temporale (Gur et al., 1999; Schläpfer et al., 1995). Additional differences have been observed in the orbital gyri, inferior frontal gyri bilaterally, and the left angular gyrus (Good et al., 2001), suggesting possible anatomical correlates of language-related cognitive performance.

These structural variations are supported by microscopic anatomical studies, such as increased neuronal density in the female temporal cortex (Witelson et al., 1995), and by reports of larger anterior commissures (Allen & Gorski, 1991), and more rounded posterior sections of the corpus callosum in females (Bishop & Wahlsten, 1997; Habib et al., 1991; Steinmetz et al., 1992). However, not all studies agree on the significance of these findings, with some research failing to replicate corpus callosum differences (Byne et al., 1988; Constant & Ruther, 1996). Conversely, male brains tend to be approximately 11% larger in total volume (Luders et al., 2005; Peters, 1991; Pakkenberg & Voigt, 1964; Ruigrok et al., 2014), with certain areas—such as the inferior parietal lobule (Frederikse et al., 2000), the interstitial nuclei of the anterior hypothalamus (Byne et al., 2000), and the globus pallidus and putamen (Giedd et al., 1997)—also displaying greater size.

These anatomical differences may be functionally relevant. Studies suggest that males often show greater left-hemisphere dominance for verbal tasks, as indicated by both lesion-based (McGlone, 1980; Inglis & Lawson, 1881) and neuroimaging studies focusing on posterior language regions (Kansaku et al., 2000). Furthermore, neuroimaging research into emotional processing indicates gender-specific patterns of brain activation. Women tend to exhibit stronger neural responses to negative emotional stimuli, which correlates with the higher incidence of depression and anxiety disorders in females. In contrast, men show stronger neural activation in response to positive emotions (Stevens & Hamann, 2012). Specifically, women demonstrate heightened activity in the left amygdala, thalamus, hypothalamus, mammillary bodies, left caudate, and medial prefrontal cortex, while men show greater activation in the bilateral inferior frontal gyrus and right fusiform gyrus—especially in response to positive stimuli.

Recent research has further examined gender differences in interhemispheric connectivity. Studies by Allen and Gorski (1991), deLacoste-Utamsing and Holloway (1982), Grein (2013), and Steinmetz et al. (1995) indicate that the corpus callosum and anterior commissure are structurally more substantial in females, potentially facilitating more efficient cross-hemispheric integration. This enhanced connectivity may support observed cognitive advantages in females, such as stronger verbal memory and fluency (Bell et al., 2006; Bornstein et al., 2004; Eriksson et al., 2012; Ikezawa et al., 2008; Kansaku et al., 2000). Longitudinal studies suggest that when early advantages in verbal tasks are observed in girls, these differences tend to persist into adolescence (Bornstein et al., 2004; Eriksson et al., 2012).

Memory system differences have also been implicated in gendered cognitive strategies. According to Ullman et al. (2008), females are more likely to rely on the declarative memory system during language tasks, while males often draw on procedural memory (Steinhauer & Ullman, 2002; Ullman & Estabrooke, 2004). These differences can influence language learning: women may benefit from their ability to recognize and retrieve linguistic patterns, enabling more efficient acquisition of new vocabulary (Hartshorne & Ullman, 2006). Kaushanskaya et al. (2013) found that girls aged five to seven outperformed boys in word learning tasks, potentially due to greater capacity to leverage long-term linguistic representations in declarative memory.

The interplay between these memory systems may be competitive. Ullman (2004) described a "see-saw" effect whereby dominant reliance on declarative memory may inhibit procedural memory processes. Sorensen and Witter (1983) proposed that anatomical factors might mediate this balance, while Calabresi et al. (2000) and Ullman (2004) suggest that neurotransmitters such as acetylcholine—

modulated in part by estrogen—may enhance declarative memory but suppress procedural memory pathways.

These findings intersect with research on the neural overlap between language and music processing. According to Patel (2003) and Brown et al. (2006), language and music share at least partially overlapping neural substrates. This suggests that sex differences observed in language cognition may also manifest in music cognition. Supporting this, Alonso-Nanclares et al. (2008) found greater synaptic density in the male temporal neocortex, whereas Burman et al. (2007) proposed that females may engage a supramodal language network independent of sensory modality. This distinction implies that men and women may recruit fundamentally different neurocognitive mechanisms during linguistic processing, extending beyond the declarative–procedural memory divide (Steinhauer & Ullman, 2002; Ullman & Estabrooke, 2004).

Beyond neurological explanations, psychological traits also play a role. Research shows that women generally demonstrate higher levels of self-regulation and self-discipline traits linked to academic success (Duckworth & Seligman, 2006; Matthews et al., 2009). These abilities may contribute to female advantages in verbal tasks by enabling greater attentional control and persistence, suggesting that gender differences in performance are not solely driven by biological factors but are shaped by complex biopsychosocial interactions.

Implications of these findings extend into educational practice. Understanding how gender influences cognition, language, and music learning can inform differentiated instruction strategies that acknowledge both individual variability and structural patterns.

In the realm of music education, gendered preferences further illustrate these dynamics. Studies consistently show that girls report stronger musical preferences than boys (Crowther & Durkin, 1982; Reić Ercegovac & Dobrota, 2011), particularly for rhythmic-dance genres and popular music (Finnas, 1989; Zillman & Gan, 1997; Dobrota & Reić Ercegovac, 2009). These preferences are understood through interactionist models (Swann et al., 2002), which posit that individuals are drawn to music reflecting their personalities, attitudes, and emotions. Herberger (1987) found that boys preferred rock, while girls favored pop music. Similarly, May (1985) observed that girls tended to choose slower, softer music, whereas boys preferred more rhythmically intense and dynamic genres such as rock, country, and jazz. Moreover, boys have been reported to show less favorable attitudes toward classroom music, potentially due to biological factors such as delayed vocal maturation, sex-linked singing difficulties, and related developmental conditions (Trollinger, 2021, p. 34). Götze

and Horii (1989) also observed that girls tend to sing more accurately in group settings, possibly due to higher responsiveness to peer vocal cues.

While gender offers insight into cognitive, emotional, and behavioral dimensions of learning, linguistic background—particularly L1 proficiency and bilingual experience—provides the foundational scaffolding for second language development. A substantial body of research demonstrates that L2 proficiency is strongly influenced by L1 proficiency (Sadakata & Sekiyama, 2011). The language(s) spoken at home and the family's broader linguistic context play a central role in shaping prior language knowledge (Schecter & Bayley, 2002). Understanding whether learners have been exposed to additional languages during early childhood, or whether one or both parents speak a different native language from that used in daily communication, provides essential insights into their linguistic foundation (Cummins, 2008; Kuhl, 2011).

Nation's (1990, 2013b) work on learning burden underscores the importance of a learner's linguistic background in determining the difficulty of acquiring L2 vocabulary. The concept of learning burden refers to the extent of unfamiliar knowledge a learner must acquire for a word to be fully known. Familiarity with specific linguistic features—derived from the L1 or previously acquired languages—can ease this burden. Research by De Groot (2006) supports this claim, showing that learners acquire and retain L2 vocabulary more effectively when it shares orthographic or phonological similarities with the L1. For example, Hamada and Koda (2008) found that learners whose L1 uses a similar alphabet to English are better equipped to learn English word forms than those with non-alphabetic L1s such as Chinese or Korean.

This influence extends to memory processes involved in language learning. Long-term memory, shaped by the lexical and semantic structures of the L1, plays a key role in short-term retention and processing of new language input (Hulme et al., 1991; Martin & Saffran, 1999). In particular, phonological short-term memory is affected by the structural properties of the L1, influencing how efficiently learners can store and retrieve new word forms (de Jong et al., 2000; Gathercole & Baddeley, 1990; Masoura & Gathercole, 1999; Papagno et al., 1991). Words that align with familiar L1 phonological patterns tend to be learned and retained more quickly (Ellis & Beaton, 1993; Gathercole et al., 1991; Papagno & Vallar, 1992; Rogers, 1969; Service & Craik, 1993; Storkel, 2001), as learners can leverage pre-existing L1-based knowledge stored in long-term memory. These findings provide a foundation for exploring the declarative/procedural model of language learning, particularly how phonological familiarity can activate declarative memory systems during early vocabulary acquisition.

Building upon L1-related effects, bilingualism introduces additional layers of linguistic processing and cognitive control relevant to L2 development. A growing body of literature highlights the cognitive advantages of bilingualism, particularly in terms of executive functioning and attentional control (Bialystok, 1999, 2001; Bialystok et al., 2008; Bialystok & Barac, 2013; Kapa & Colombo, 2013). These advantages are thought to arise from the demands of regular language switching and inhibition in bilingual individuals, fostering enhanced metalinguistic awareness and mental flexibility (Bialystok & Barac, 2013). Poarch and Bialystok (2015) found that bilingualism can even modify cognitive neural networks, with fMRI research showing that bilingual children engage overlapping brain areas for L1 and L2 processing. In contrast, monolinguals who learn a second language later in life often activate more isolated regions in Broca's area (Kim et al., 1997; Nitsch, 2007).

This neural efficiency contributes to long-term L2 proficiency gains. Bialystok et al. (2009) and Bialystol (2014) reports that while bilinguals may sometimes experience delays in lexical retrieval or reduced vocabulary size compared to monolinguals, they consistently demonstrate enhanced executive control across the lifespan. These cognitive benefits emerge in early childhood, remain stable through adulthood, and decline more slowly with age. However, findings from memory research are more nuanced. While bilinguals may perform less well on certain verbal recall tasks, they tend to perform as well as or better than monolinguals on tasks involving nonverbal or controlled processing (Bialystok 2001, as cited in Rumlich, 2016, p. 184).

The interaction of bilingualism and musical experience also warrants attention. In a comparative study, Moradzadeh et al. (2015) examined task-switching and dual-task performance in monolingual and bilingual musicians versus non-musicians. The results revealed that musicians consistently outperformed non-musicians across both tasks, suggesting that musical training may enhance executive functioning-skills that are particularly relevant to bilingual language learning.

From an educational perspective, bi- and multilingualism is increasingly recognized as a multidimensional construct, shaped by the typological relationship between languages, proficiency levels, and the sociolinguistic value attributed to each language (Cenoz, 2003). These variables are further modulated by sociocultural and demographic factors such as migration background, parental education, socioeconomic status, and language use at home (Baker, 2011; Horwitz, 2001; Krashen, 1981). The DESI study (Hesse et al., 2008), a nationally representative analysis of EFL proficiency in Germany, provides compelling evidence for the complexity of multilingual effects. Students were categorized as mono-German (monolingual with

German as L1), multi-German (multilingual with German as one of their L1s), and non-German (students without German as an L1).

Descriptive analyses initially suggested that multi-German learners outperformed other groups in overall EFL proficiency, while mono-German learners generally outperformed non-German learners. However, when controlling for variables such as socioeconomic status, gender, and cognitive ability, both multilingual groups significantly outperformed monolingual German speakers in EFL performance, though no clear advantages were observed in more specific skill areas such as text reconstruction or general EFL proficiency.

Further support for the positive role of multilingualism comes from Schwanke et al. (2015), who found that the presence of multilingual students had a beneficial effect on overall classroom achievement, reinforcing the broader view that multilingualism contributes positively to foreign language learning. Rumlich (2016) likewise emphasizes the context-sensitive and multifactorial nature of bilingualism's impact (p. 184), noting that it interacts with a host of mediating variables, making its effects difficult to isolate or generalize. Consistent with Cummins' (2008) interdependence hypothesis, the development of strong L1 skills provides a cognitive foundation that can support additional language learning. Nonetheless, Hesse et al. (2008) acknowledge methodological limitations in their work, particularly concerning the reliability of self-reported data related to language background.

Exposure to English outside formal instruction—often termed extramural English—includes language encounters through media, travel, reading, and social platforms (Brevik & Holm, 2022; Lai et al., 2015; Peters, 2018; Sundqvist, 2009). Despite its relevance, exposure to English has received relatively limited attention in empirical classroom-based L2 research (Benson, 2011). Nevertheless, its significance is growing, particularly due to its connection with vocabulary acquisition (Sundqvist & Wikström, 2015) and its inclusion in more recent studies such as Schurz and Sundqvist (2022).

Gender-based patterns have emerged in the context of English exposure. Research consistently shows that boys tend to engage more frequently with English through video games and media consumption (Brevik, 2016; Jensen, 2017; Olsson & Sylvén, 2015; Sundqvist & Wikström, 2015). Paradoxically, although boys report greater exposure, girls consistently outperform boys in school-based language achievement, especially in tasks related to language learning (Voyer & Voyer, 2014). Köller (1998) outlined various opportunities for language learning outside formal instruction, including reading, traveling, and media use. Social media has also become a crucial factor, serving as a platform where English functions as a lingua franca (Levitin, 2006). However, among all informal learning contexts, extended

stays in English-speaking countries have been shown to yield the greatest benefit. For instance, Köller et al. (2004) found that students' TOEFL scores improved significantly after four weeks abroad, with longer stays correlating with even greater proficiency gains (Oksaar, 2018).

The role of exposure in L2 acquisition has long been emphasized as a foundational component of language development (Fishman, 1972; Byram, 1997; Baker & Prys Jones, 1998). Vocabulary acquisition occurs not only through classroom instruction but also via learner-driven activities outside school. While formal settings offer structured input and feedback, extramural learning fosters learner autonomy and strategic vocabulary development (Webb & Nation, 2017).

Exposure to English outside the classroom, particularly through informal and self-directed activities, may enhance lexical sensitivity and frequency awareness. It is therefore examined as a covariate in this study to account for individual differences in MWU acquisition that may arise independently of the intervention.

One of the most widely reported sources of out-of-school English exposure is music listening. Several studies have identified listening to English music as a frequent and impactful form of L2 contact and exposure (De Wilde et al., 2018; Lindgren & Muñoz, 2013; Muñoz, 2020; Schwarz, 2013). In a comparative study, Lindgren and Muñoz (2013) examined a range of extracurricular activities—such as internet use, video games, and film watching—and found that listening to music emerged as the most common L2 exposure activity among learners. Similarly, Kuppens (2010) reported that over 90% of Flemish Dutch-speaking primary students listened to English music more than three times per week, making it the most prevalent extramural input.

Miranda (2013) highlighted that adolescents independently invest considerable time in music listening, with U.S. teens spending up to three hours per day and accumulating over 10,000 hours of music listening during adolescence. Summer (2010) confirmed this trend in the German context: students reported listening to music for an average of 141 minutes daily, with 72% of this time—approximately 102 minutes—dedicated to English-language songs. The 2023 JIM study further supports these findings, indicating that German students aged 12 to 19 spend an average of 224 minutes online daily, including 115 minutes listening to music via platforms like Spotify, with girls (124 minutes) reporting higher engagement than boys (106 minutes).

Importantly, the context and platform through which music is consumed affect the degree of immersion and engagement on the part of the listener. Pupils may passively encounter English music in shared family spaces (e.g., during car rides) or engage in focused listening with headphones, resulting in deep linguistic immersion.

Platforms like Spotify and YouTube also shape this experience differently: while Spotify offers uninterrupted audio exposure, YouTube often includes visual stimuli through music videos, which may enhance affective and cognitive engagement (Justin & Sloboda, 2001; Lonsdale et al., 2007).

Among the many forms of extramural English exposure, listening to English pop songs has emerged as a highly prevalent and linguistically rich source of input—particularly among adolescents. Its role in vocabulary learning therefore warrants focused investigation as a distinct variable (exposure to pop songs) Pop songs are among the most favored genres among adolescents and have been shown to facilitate meaningful and memorable vocabulary acquisition (Mannarelli & Serrano, 2022; Murphey & Alber, 1985; Pavia et al., 2019; Schwarz, 2013). Recent findings by Balenović and Proroković (2023) provide empirical support for the predictive role of English pop song exposure in vocabulary development.

As pop songs form the core input of the intervention, prior exposure to English pop music is treated as a distinct variable to evaluate whether habitual engagement with this genre facilitates lexical uptake, especially in terms of familiarity with rhythmically and melodically structured MWUs.

Finally, musical training represents a cognitively grounded factor that may influence vocabulary learning through its impact on auditory perception, memory, and rhythm processing. Unlike passive exposure to music, musical training involves systematic skill development with potential cross-domain benefits for language learning. Musical training induces functional and structural changes in the brain, enhancing capacities such as auditory discrimination, working memory, and temporal processing. These benefits extend beyond musical ability and directly support language acquisition and retention. Neuroimaging studies have shown that musicians outperform non-musicians in tasks involving auditory stimuli, verbal memory, and phonological processing, due to enhanced connectivity in brain regions involved in auditory and motor integration. For a comprehensive examination of the neurological and cognitive mechanisms underpinning these effects, refer to Sections 2.1.5.2, 2.1.5.3, and 2.1.5.4.

In sum, existing literature highlights the significant and multifaceted roles of gender, linguistic background, exposure to English, pop music engagement, and musical training in shaping learners' vocabulary development. These variables merit further investigation in relation to MWU learning within music-based EFL instruction.

2.2 Pedagogical Perspectives on Music-Based Learning

Music, one of the oldest forms of human expression, has long been intertwined with communication, memory, and above all with learning. Historically, before the widespread availability of written language, music—particularly in the form of song—played a central role in preserving and transmitting knowledge. In preliterate societies, bards traveled between communities and courts, using songs to narrate significant tales, such as those of conquest and tragedy. The rhythmic and melodic structures of these "bard songs" not only supported oral tradition but also enhanced memorability, enabling critical information to be passed down across generations (Calvert & Tart, 1993).

This oral tradition laid the groundwork for the later institutionalization of music in formal education. In the Latin schools of the Middle Ages, music became a key pedagogical tool, especially for the teaching of Latin. According to Kelly (1969), pupils were first introduced to Latin through "song schools," which employed plainchant grounded in natural speech patterns to orient learners to the flow and rhythm of the language. Beyond the liturgical context, both sacred and secular music were integrated into medieval education. Influential figures such as St. Jerome and Abelard emphasized the importance of sacred music in Latin instruction, while contemporary music treatises addressed pronunciation features such as vowel quality, syllabic length, and intonation. To address pronunciation challenges—such as the treatment of silent letters-liturgical music introduced innovative techniques like "liquescent" notes, which highlighted otherwise omitted consonants. These strategies often resulted in a pronunciation standard that even surpassed that of classical Latin. A notable example comes from Clenardus' school in Brega, where a song originally used to teach greetings became so widespread that its opening line—*Heus pure*—entered everyday usage across social classes.

Building on this historical foundation, Anton (1990) introduced the Contemporary Music Approach, which underscores music's distinctive power as a mnemonic aid in teaching and learning. Subsequent studies in educational contexts have further demonstrated music's pedagogical value: it enhances oral communication skills such as speaking and listening (Lorenzutti, 2014; Orlova, 2003), supports literacy development (Paquette & Rieg, 2008; Salmon, 2010), and facilitates the acquisition of prosodic features like rhythm and intonation (Fonseca-Mora & Gant, 2016; Spicher & Sweeney, 2007). Reinforcing this perspective, Werner (2018) draws attention to the natural association between music and memory, exemplified by the common experience of songs involuntarily replaying in one's mind. Given the central role of memory in language learning, such findings help explain the enduring

presence of music-based approaches in language classrooms—an educational practice documented as early as the 1960s (Richards, 1969).

2.2.1 Songs in English as a Foreign Language Education

Songs, often described as the "ideal marriage of poetry and music," are among the most authentic expressions of human experience, encompassing emotions and everyday realities (Deliére & Lafayette, 1985, p. 412). Far from being mere combinations of text and melody, songs emerge from a shared mental and emotional space involving the performer, the audience, and the surrounding context (Murphey, 1990a). This collective experience was found to stimulate both hemispheres of the brain: the left processes linguistic content, while the right responds to melody (Guglielmino, 1986).

The pedagogical value of songs has long been recognized in English as a Second Language (ESL) instruction (Hazel-Obarow, 2004; Reeve & Williamson, 1987; Guidice, 1986). Similarly, in English as a Foreign Language (EFL) contexts, learner surveys confirm that songs are perceived as both enjoyable and effective for language acquisition (Abdul Razak & Yunus, 2016; Romero et al., 2012; Setia et al., 2012). Richards (1969) emphasized the motivational benefits of songs, noting that "pleasure for its own sake is an important part of language learning," a dimension often overlooked by both teachers and course designers (p. 161). He further argued that songs create a more child-centered and engaging learning environment.

This emotional engagement plays a decisive role in memory and learning. Songs frequently trigger strong emotional responses (Krüger, 2011, 2014), and emotions are widely known to enhance memory formation (Eschrich et al., 2008; Sprenger, 1999). In educational terms, Meier (2010) advocated for teaching to the "whole brain," where emotional resonance is key. Bolitho et al. (2003) echoed this, highlighting how emotional engagement activates deeper neural processing. Words linked to emotions are more likely to be encoded in long-term memory (Grimm et al., 2015), and the emotionally focused nature of music complements the referential function of language, creating a synergistic learning effect (Brown, 2000; Altenmüller, 2006; Luckner, 2007).

Moreover, the repetitive structure of songs plays a crucial mnemonic role. Recurrent exposure to the same repeated MWUs in choruses, pre-choruses, and verses reinforces retention and aids long-term memory (Brown et al., 2008; Calvert & Tart, 1993; Fonseca-Mora, 2000; Hyman & Rubin, 1990; Kweon & Kim, 2008; Laufer & Rozovski-Roitblat, 2011; Pellicer-Sánchez & Schmitt, 2010; Pigada & Schmitt, 2006; Rott, 1999; Schlepp, 2001; Waring & Takaki, 2003; Webb, 2007b; Webb &

Nation, 2017). This process aligns with the statistical learning model, which holds that learners acquire language by repeatedly encountering lexical items within meaningful input (Romberg & Saffran, 2010). Trapp (1991) reinforced this notion: "The more repetition you give your students, the more likely it is that they will retain the message" (p. 438). Similarly, Tegge (2015) noted that "the full acquisition of a word requires repeated encounters to consolidate existing and acquire further elements of word knowledge" (p. 5). However, the required number of repetition remains debated: Brown et al. (2008) suggested that at least 20, and ideally 50 or more, repetitions may be necessary for robust learning. In contrast, Webb (2007c) demonstrated that meaningful learning could occur with as few as ten exposures, though even this fell short of achieving full lexical mastery. In his 2007b study, Webb found progressive gains in ten different aspects of word knowledge—including orthography, meaning, form, and grammatical function—correlating with increasing repetition levels (one, three, seven, and ten times).

Closely linked to repetition is the rhythmic structure of songs, which also supports linguistic processing. Songs typically feature predictable rhythm, consistent fundamental frequency, and metrical patterns reinforced by rhyme. These features heighten the salience of the sound structure of words, facilitating phonological processing. Furthermore, songwriters often align MWUs with musical phrases, strengthening the internalization of these linguistic chunks through the interplay of repetition and rhythmic predictability (Arbib et al., 2013). This alignment offers a stable temporal framework that enhances memory and comprehension more effectively than the irregular rhythms of natural speech (Vanden Bosch der Nederlanden et al., 2020).

Another key element is the multimodal nature of songs, which significantly contributes to their mnemonic efficacy. Songs engage multiple sensory channels simultaneously—combining music, rhythm, linguistic sound patterns, mental imagery, and kinesthetic experiences—which enhances cognitive processing and facilitates deeper learning (Abbot, 2002; Engh, 2013; Willis, 2010). This simultaneous activation fosters the development of rich, interconnected memory networks, enabling more durable storage and retrieval of information (Levitin, 2008; Wallace, 1994). Sambanis and Walter (2019) emphasized that effective long-term retention depends on two key conditions: an impactful initial learning experience and sufficient repetition. In alignment with this, Hutz (2012) argued that vocabulary learning is significantly strengthened when words are processed through multiple sensory pathways, as the brain functions not linearly, but in parallel and interconnected networks. Supporting this view, Meier's (2019) large-scale study *Stress Reduced Foreign Language Learning*—conducted with nearly 10,000 learners across 16 countries—highlighted the benefits of multisensory engagement through music for vocabulary reten-

tion. The deeper the sensory involvement, the more efficiently MWUs are encoded and retrieved (Hutz & Kolb, 2010; Bleyhl & Timm, 1998; Gairns & Redman, 1986). This explains the pedagogical strength of songs in EFL education, where their rich lexical content, presented through multimodal input, supports holistic learning (Lindgren & Muñoz, 2013; Overmann, 2005). Moreover, this multimodal engagement stimulates both brain hemispheres-the left for linguistic content and the right for melody—thereby allowing for multiple layers of cognitive processing and supporting retention of both language structures and content (Carroll, 2000; Ginsborg & Sloboda, 2007; Guglielmino, 1986; Jentschke, 2016; Larsen-Freeman & Long, 2000; William & Burden, 1997). Neuroscientific models such as the Competition of the Hemispheres Theory and Moscovitch's Inhibition Hypothesis provide further explanation: when one hemisphere becomes more active, it can suppress inhibitory control from the other, enhancing overall cognitive performance (Hilgetag, 2002).

Beyond cognitive benefits, songs also offer important social advantages in the language classroom. Group singing provides a collaborative, synchronous experience that fosters classroom cohesion (Overy & Molnar-Szakacs, 2009). It can also reduce performance anxiety by creating a shared environment where shy learners feel less exposed (Smith Salcedo, 2002). As Nambiar (1993) observed, learners are often willing to sing in a foreign language even without fully understanding the lyrics, highlighting music's emotional accessibility and its ability to motivate participation (p. 336).

Finally, from an applied linguistic perspective, song lyrics expose learners to both standard and non-standard language varieties. This includes authentic speech patterns often absent from textbooks (Werner, 2012; Smith Salcedo, 2002), fostering critical awareness of different registers and language varieties (Duff & Zappa-Hollman, 2013; Werner, 2019a, 2021a). Murphey (1990a) warned that excluding such extra-scholastic materials risks disconnecting classroom learning from learners' lived realities (p. 221). In contrast, authentic lyrics offer what Burke (1973) called "equipment for living," empowering learners with tools for real-world communication. Iantorno and Papa (1979) similarly noted that songs mirror youth concerns and help establish rapport between teachers and learners. Coats (2016) emphasized that lyrics-based instruction allows learners to integrate personal interests and experiences, enriching engagement and contextualizing language use. In this way, music offers access to native-speaker language and authentic texts, increasing motivation (Gilmore, 2007; Mishan, 2005). As Rüschoff (2010) argued, authentic materials, tasks, and communicative purposes mirror the complexities of actual language use, serving as powerful catalysts for language development and communicative competence.

2.2.2 Authentic Pop Songs in English as a Foreign Language Education

Authentic pop songs can be a powerful resource in EFL instruction, combining linguistic authenticity (Coats, 2016; Iantorno & Papa, 1979; Werner, 2018b, p. 4), emotional resonance (Zola & Sandvoss, 1976), and cultural familiarity (Little, 1983; Monreal, 1982) to foster deeper, more engaging language learning experiences.

The term "authentic" refers here to commercially produced English-language songs that are not adapted or modified in any way for pedagogical purposes. Unlike simplified "educational songs," authentic pop songs reflect real-life language use and provide learners with exposure to both standard and non-standard language varieties (Werner, 2012). They reflect ongoing linguistic change and introduce learners to "living language" as opposed to the formulaic structures of textbooks (Urbancic & Vizmuller, 1981). This contributes to an "experience of authenticity" (Rüschoff, 1998, p. 21), aligning language learning with learners' lived realities (McCarthy & McCarten, 2018; Nassaji & Fotos, 2011; Römer, 2004; Rühlemann, 2008). Since overly simplified textbook language can be demotivating (Willis & Mason, 1994; Bell & Gower, 1998; McGrath, 2002; Nunan, 1989), integrating authentic pop songs into instruction bridges the gap between "school English" and "real-world English," fostering the functional use of MWUs (Celce-Murcia, 1991; Glisan & Drescher, 1993) and encouraging more natural language production (Azaryad Shecter, 2018; Grau, 2009; Römer, 2004; Skehan, 1998; Tomlinson & Masuhara, 2018). This promotes critical awareness of registers and linguistic variation (Duff & Zappa-Hollman, 2013; Gilmore, 2007; Mishan, 2005; Werner, 2019b, 2021a) and helps ensure that classroom learning remains connected to real-world communication (Murphey, 1990a, p. 221).

Although pop lyrics are often perceived as linguistically simple—primarily due to their low type/token ratio and frequent thematic repetition (Campbell, 2006; Kreyer & Mukherjee, 2007; Murphey, 1992a)—closer analyses reveal a more intricate linguistic structure. Werner (2012) demonstrated that, despite their low lexical density and preference for regular syntactic patterns, pop lyrics incorporate a range of complex linguistic features. Contractions frequently coexist with full forms, and creative language use emerges through neologisms, deviant spellings, and nonstandard grammatical structures, such as the "get-passive." The absence of discourse markers and interjections further reflects the scripted and stylized nature of song production (Coupland, 2000; Kreyer & Mukherjee, 2007). Moreover, pop songs consistently utilize high-frequency verbs and simple colloquial expressions while avoiding difficult idioms, making them accessible to language learners (Urbancic & Vizmuller, 1981, p. 81). Murphey (1989, 1990b, 1992) observed that pop lyrics typically average seven words per sentence, positioning them as a "written-to-be-sung" genre

that merges elements of both spoken and written discourse (Kreyer & Mukherjee, 2007, p. 37). This hybrid character is reinforced by the frequent use of imperatives and questions and the tendency toward vague references to time, place, and person (Murphey, 1989). As Werner (2012) and Westphal (2021) highlighted, although pop lyrics resemble spoken text, they are deliberately constructed, rehearsed, and often stylistically exaggerated. Furthemore, Tegge (2017) found that their lexical demands are equivalent to or lower than those of many spoken and written genres, making them suitable for beginning learners when paired with appropriate instructional support.

Pop lyrics are dominated by high-frequency vocabulary: the most common 2,000 word families account for over 93% of the content in both chart-topping and teacher-selected songs (Webb & Nation, 2017). This coverage surpasses that of other authentic media, including TV shows, films, and everyday conversation (Webb & Rodgers, 2009a, 2009b; Nation, 2006). Öztürk (2017) corroborated these findings, noting that 95% of the words in widely popular English songs fall within the top 1,000 word families (p. 54), underscoring their effectiveness for teaching core vocabulary.

Beyond their linguistic accessibility, pop songs carry strong emotional appeal. Their emotionally charged words and themes enhance retention and memorability (Gairns & Redman, 1986; Braun & Clarke, 2006). Murphey (1990a) likened pop songs to "motherese" or lullabies, emphasizing their role as emotionally comforting and communicatively rich (p. 127). This emotional engagement facilitates learner motivation and can enhance memory formation even when full lexical comprehension is lacking (Nambiar, 1993). Furthemore, Murphey (1989a, 1990a) emphasized that the vagueness of pop lyrics allows listeners to project their own experiences onto the text, deepening emotional resonance and enhancing relatability.

From a musical perspective, pop songs are intentionally crafted to be memorable and accessible. Their melodies are typically catchy and easily internalized (Harrison, 1997; Murphey, 1992; Wallace, 1994), and their compact length—usually between two and three minutes—makes them well-suited for classroom use. Importantly, pop songs frequently include strategic pauses that create space for listener reflection and enhance processing of the lyrics (Smith Salcedo, 2002; Tegge, 2015, p. 129). These pauses have been shown to support cognitive processing by providing the brain with time to organize and retain linguistic input (Lane et al., 1973; Rivers, 1976). In addition, clear enunciation by singers (Urbancic & Vizmuller, 1981; Monreal, 1982), coupled with the slower pace of sung lyrics—approximately 75% of the speed of spoken language—further facilitates understanding and supports language acquisition (Busse et al., 2018; Kilgour et al., 2000; Werner, 2020).

From both a musical and linguistic standpoint, pop songs are inherently repetitive (Wray & Perkins, 2000). Their standardized structure (intro, verse, pre-chorus, chorus, bridge, outro) combines musical repetition with recurring linguistic patterns (Brown et al., 2008; Calvert & Tart, 1993; Hyman & Rubin, 1990; Fonseca-Mora, 2000; Kweon & Kim, 2008; Laufer & Rozovski-Roitblat, 2011; Pellicer-Sánchez & Schmitt, 2010; Pigada & Schmitt, 2006; Rott, 1999; Schlepp, 2001; Tegge, 2015; Trapp, 1991; Wallace, 1994; Waring & Takaki, 2003; Webb, 2007a; Webb & Nation, 2017), which in turn supports MWUs acquisition in alignment with statistical learning models (Romberg & Saffran, 2010). In this regard, Murphey (1990a) noted that listeners can often sing the final refrain of pop songs after only one exposure (p. 84).

Finally, English's global role as the lingua franca of pop music gives teachers and instructors access to a wide range of contemporary, culturally relevant materials, further enhancing the motivational and pedagogical value of incorporating authentic pop songs into EFL education.

2.3 Empirical Studies on Music-Based Vocabulary Learning

This section provides a comprehensive review of empirical studies examining music-based instruction in vocabulary learning, with a focus on first language (L1), L2, and foreign language (FL) contexts. Specifically, section 2.3.1 reviews empirical studies on music-based approaches in L1 vocabulary learning, with particular attention paid to studies involving children and young adults in school-based settings. section 2.3.2 turns to research on music-based instruction in second and foreign language learning, with an emphasis on vocabulary acquisition in school and university contexts. Studies are categorized based on their methodological rigor and educational context, and include a critical examination of research design, duration of treatment, and vocabulary assessment methods. Together, these two sections synthesize the current state of research on music as a pedagogical tool for vocabulary development, highlighting both the strengths and limitations of existing studies and identifying gaps that inform the methodological design of the present dissertation.

2.3.1 Empirical Studies on Music-Based Approaches in First Language Vocabulary Learning

A growing body of research has underscored the potential of music to support L1 development, particularly with respect to vocabulary learning and verbal memory. Evidence suggests that musical elements such as melody, rhythm, and repetition can significantly enhance the retention and retrieval of L1 vocabulary over time.

One of the earliest empirical investigations in this domain was conducted by Van Assel (1970), who examined the use of songs and poems in German primary school classrooms. His findings indicated that these musical forms were not only learned more quickly but were also retained more effectively over short periods than conventional dialogues. Despite their limited grammatical and lexical content, songs facilitated transfer to broader language contexts, such as sentence construction. Remarkably, pupils with special educational needs achieved pronunciation performance comparable to their peers, suggesting that musical instruction may serve as an inclusive and supportive pedagogical tool for learners with varying cognitive abilities.

The role of melody in verbal memory was further explored by Wallace (1994). Wallace investigated participants' ability to recall the lyrics of a folk ballad under three conditions: spoken text, sung text with different melodies for each verse, and sung text with a repeated melody across all verses. Her results showed that participants in the repeated melody condition achieved the highest recall scores, as measured through a written free recall test. Wallace hypothesized that unfamiliar or frequently changing melodies act as cognitive distractors, while a stable melodic pattern provides a familiar scaffold that facilitates memory. This hypothesis was supported by Purnell-Webb and Speelman (2008), who argued that unfamiliar melodic and rhythmic patterns can overwhelm cognitive processing resources (pp. 953–954). As the melody becomes familiar, however, it supports recall by providing structural cues such as syllable counts and verse segmentation.

The facilitative role of familiar melodies in vocabulary learning has also been confirmed in developmental contexts. Coyle and Gómez Gracia (2014), for example, demonstrated significant vocabulary gains in five- to six-year-old children following repeated exposure to a familiar children's song. Their findings underscore the power of musical familiarity in enhancing recall, even when the lyrics lack syntactic structure. Wallace (1994) similarly concluded that melody plays a more substantial role than rhythm alone. Her research showed that rhythmically spoken text accompanied by a beat resulted in lower recall accuracy than sung text, suggesting that melody offers a more robust scaffolding mechanism. She emphasized that repeated, simple melodies enable verbatim recall by aiding the chunking of vocabulary. As she put it, "Music is a rich structure that chunks words and phrases, identifies line lengths, identifies stress patterns, and adds emphasis as well as focuses listeners on surface characteristics. The musical structure can assist in learning, in retrieving, and if necessary, in reconstructing a text" (p. 1471). This view aligns with Deutsch's (1999) argument that the redundancy and hierarchical organization found in musical templates can enhance relational processing by grouping discrete items into meaningful, retrievable units.

Further empirical support for the impact of music on L1 vocabulary learning is provided by Bygrave (1995), who conducted a 30-week intervention with 29 primary school pupils. The experimental group engaged in a music-rich program involving singing, instrumental performance, movement, creative tasks, and listening activities, while the control group participated in storytelling sessions. Assessments were administered at three points: pre-intervention, post-intervention (week 23), and a delayed post-test seven weeks later. Notably, significant gains in receptive vocabulary emerged only at the delayed post-test, suggesting that the effects of music-based instruction may consolidate over time. However, several limitations temper the interpretation of these findings. The study featured a small sample size, limited reporting of results (only $p < .05$ was provided), and insufficient detail about the instructional materials and implementation procedures for each group. It is also unclear whether the intervention was delivered by the researcher, raising concerns about potential experimenter effects. Furthermore, the construct of "singing" was not clearly operationalized as a form of vocal training, and no information was provided regarding the frequency, duration, or sequencing of training components. Finally, the study relied on the Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981), which is no longer considered a psychometrically robust measure of receptive vocabulary.

The interaction between melody and recall was further investigated by Kilgour et al. (2000) in a study involving English-speaking university students. Participants were presented with lyrics in sung and spoken formats. Initial results suggested a memory advantage for the sung condition. However, when the duration of both formats was controlled, the advantage disappeared. The researchers concluded that previously observed benefits of melody may have been confounded by differences in presentation rate, with sung texts typically delivered more slowly, thus affording greater processing time (p. 700). This interpretation is consistent with Rubin et al. (1993), who reported that slower presentation rates promote rehearsal and improve short-term recall. Kilgour et al. (2000) also observed that participants with musical training performed better in the spoken condition than their untrained peers, lending support to earlier claims that musical expertise enhances encoding and retrieval of auditory information (Aiello & Sloboda, 1994; Palmer, 1997; Rubin et al., 1993).

In contrast to these findings, Racette and Peretz (2007) reported no memory advantage for melody in a study with native French-speaking university students. Participants were randomly assigned to one of three conditions: (1) listening to a song and repeating it by singing, (2) listening to a song and repeating it by speaking, and (3) listening to spoken lyrics and repeating them by speaking. Surprisingly, par-

ticipants recalled fewer words in the singing condition than in the spoken conditions. The authors concluded that melody may, in fact, interfere with lyric learning: "the best strategy for learning song lyrics is to ignore the melody" (p. 250). Ludke et al. (2014) proposed several possible explanations for this unexpected outcome. They noted that the melodies used by Racette and Peretz were complex and non-repetitive, in contrast to the simple, repetitive tunes found to support memory in Wallace's (1994) study. Moreover, Racette and Peretz did not control for presentation rate-an omission that may have further impacted the recall outcomes.

2.3.2 Empirical Studies on Music-Based Approaches in Second and Foreign Language Vocabulary Learning

Before reviewing empirical studies on music-based instruction in second and foreign language acquisition, it is important to underscore that learning a first language (L1) and learning a second language (L2) or foreign language (FL) involve fundamentally different cognitive processes. As a result, musical or sung presentations may affect these domains in distinct ways.

Although certain cognitive processes such as auditory memory and sequential recall may respond similarly to musical input in both L1 and L2 contexts (Rainey & Larsen, 2002), three key differences between L1 and L2 acquisition are particularly relevant in this context. First, the degree of exposure differs significantly: L2 learners generally receive considerably less input in the target language compared to native speakers, leading to weaker collocational associations in the L2 (Hutz, 2013). Second, the nature of the input varies—while L1 learners acquire vocabulary incidentally in naturalistic contexts, L2 input is often artificially constructed and based on subjective criteria such as assumed frequency or semantic relevance. Third, L1 learners process lyrics largely automatically, whereas L2 learners—especially beginners—engage in more cognitively-demanding processing focused on smaller linguistic units, or "chunks" (Ludke et al., 2014). Music-based instruction has the potential to mitigate several of these challenges. Songs provide learners with authentic, context-rich language exposure, present vocabulary in meaningful chunks, and offer frequent, enjoyable engagement with the target language—particularly due to music's pervasiveness in everyday life.

Building on the preceding preamble, this section presents a structured synthesis of empirical studies that form the theoretical foundation for the present research. Following the selection criteria outlined by Werner (2020), a number of studies were excluded. In several cases, full texts were unavailable, and the authors could not be contacted due to outdated or missing information (e.g., Ayotte, 2004; Hazel-Obarow,

2004). Further studies were excluded based on methodological or contextual limitations. Specifically, studies were omitted if they reported solely on laboratory-based findings (e.g., parts of Ludke, 2010; 2018; Tamminen et al., 2017), employed research designs without a control group (e.g., Albaladejo Albaladejo et al., 2018; Çevikbaş et al., 2018; Coleman, 2014; Coyle & Gómez Garcia, 2014; Fadhli, 2017; Karlina et al., 2017; Limbong, 2012; Schwarz, 2013), relied exclusively on pedagogical songs drawn from textbooks or composed explicitly for the study (e.g., Bailles et al., 2021; Busse et al., 2018; Haghverdi, 2015), and focused exclusively on learner attitudes (e.g., Chen, 2016; Hadian, 2015; Lieb, 2008). Moreover, studies that primarily addressed other learning domains—such as overall language proficiency or literacy development (e.g., Fisher, 2001; Li & Brand, 2009; Shen, 2009), verbal recall (e.g., Smith Salcedo, 2010; Tomczak & Lew, 2019), grammar acquisition (e.g., Kara & Aksel, 2013; Tavakoli, 2013), listening comprehension (e.g., González Arteaga, 2019; Rahbar & Khodabakhsh, 2013; Rezaei & Ahour, 2016), or oral/written fluency (e.g., Ashtiani & Zafarghandi, 2015; Alisaari & Heikkola, 2016)—were also excluded, as their primary focus lay outside vocabulary learning.

The subsequent analysis synthesizes key aspects of the selected studies, including sample characteristics, target language, testing instruments, duration of the treatment period (DTP), and overall effect (E). The effect is classified as follows: + = greater (statistically significant) effect compared to control; - = smaller (statistically significant) effect compared to control; o = comparable effect to control. Where relevant, contextual information is provided to support interpretation. For conciseness, multiple choice and blank fill test formats are abbreviated as MC and BF, respectively. The following tables summarize the core characteristics and outcomes of selected empirical studies on music-based vocabulary instruction in second language (Table 3) and EFL (Table 4) contexts.

Table 3. *Overview of Empirical Studies on Vocabulary Learning through Music-Based Instruction in Second Language Contexts*

Study	***N***	**Learners' first language (s)**	**Target language (s)**	**Test(s)**	**DTP**	**E**	**Relevant information**
Hahn (1972)	38	English	German	Written (MC+ BF)	Six-week period	+	• Boys excelled girls in tasks involving music, while girls performed better in spoken language activities • Combined singing with rhythmic movement • Control group taught the same content through dialogs • Qualitative questionnaire (lyrics as an enjoyable activity) • "Lyrics and music an effective mediating factor in the learning and retention of lexical items" (Hahn, 1972, p. 1)

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
Legg (2009)	56	English	French	Written	One lesson	+	• Control group was taught the same content through poems • No authentic material (poem) • Hypothesis: the association of music with vocabulary leads to better short-term memorization • Translation test • Secondary school

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
Ludke (2010)	59	English	French	No formal vocabulary test	4 weeks	o	• Song repeated in participant's mind after class • Vocabulary (and grammar) • Beginner learner groups • Test: close tests (every 7th word deleted), French-to-English translation tests (pre/mid/post) • Three learning conditions: singing, speaking, and rhythmic speaking • Participants in the singing condition showed superior overall performance compared to those in speaking and rhythmic speaking conditions • Reported occurrence of DIN

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
							• Total instruction time: ~3 hours across the 4 weeks (1.5 hours per art form) • Authentic materials (French songs) • The study did not report a clear overall advantage for the song group over the dialogue group
Salcedo (2010)	94	English	Spanish	Written	Six class period	+	• College beginner-level Spanish students • Cloze tests (every 7th word deleted from the lyrics; students filled in blanks to assess immediate and delayed recall)

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
							• Post-treatment questionnaire for Involuntary Mental Rehearsal • A 2-week delay followed the first cloze test for testing delayed recall • Authentic materials (songs)
Ludke et al. (2013)	60	English	Hungarian	No formal vocabulary test	15-minute learning period	+	• Several Hungarian language tests, including tests that assessed recall and production of spoken Hungarian phrases and paired-associate learning task • The singing group significantly outperformed both speaking and rhythmic speaking groups on two recall/production tasks ($p < .05$). Differences were not due to age, gender, mood,

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
							working memory, or musical background • No authentic materials rather experimental stimuli
Rukholm et al. (2018)	66	English	Italian	Written	Four-week intervention and a delayed posttest after an additional two weeks	+/o	• Poem condition • Incidental acquisition • Moderator variable of "elaboration" and separate testing of productive and receptive skills • Receptive and productive knowledge • Standardized vocabulary test: Vocabulary Knowledge Scale and questionnaire

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
Moufarrej and Salameh (2019)	20	English	Modern standard arabic	Written (MC)	9 weeks	+	• Two songs (no authentic materials) • Test (singing group) showed significantly higher vocabulary gains, especially in short-term and intermediate-term post-tests for song 2 (short-term: p = 0.003; intermediate-term: p = 0.0055) • Music created a relaxing learning environment, boosting motivation and engagement

Table 4. *Overview of Empirical Studies on Vocabulary Learning through Music-Based Instruction in English as a Foreign Language Contexts*

Study	***N***	**Learners' first language (s)**	**Target language (s)**	**Test(s)**	**DTP**	**E**	**Relevant information**
Medina (1990)	48	Spanish	English	Written (MC)	Four days	o	• An additional effect of pictures tested • Incidental acquisition • Elementary school in USA- age of the pupils 9 • No authentic materials (*Surprise for Benjamin Bear* by Nelson, 1989) • Qualitative questionnaire (lyrics-based activities as highly motivating)

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
Salas (2006)	12	n/a ESL learners	English	Written	Eight weeks	+	• Authentic materials (songs) • Audition technique (a method of intentional subvocal rehearsal) • Intensive rehearsal activities (daily practice sessions) and extensive rehearsal (weekly review session) • Self-developed vocabulary test (active recall, passive recall and active recognition) • High school in New Zealand
Abidin et al. (2011)	68	Malay	English	Written	Six-week period	+	Use of YouTube

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
Alipour et al. (2012)	60	Persian	English	Written MC	Two weeks	+	• Stronger effect for boys • Learners of English with high proficiency (as determined through TOEFL scores) • Immediate vocabulary recall test and longer-term retention
Köksal et al. (2013)	56	Turkish	English	Written	Twelve weeks	+	• Vocabulary (and verbal recall) • Self-developed written test • Elementary school pupils

Study	***N***	**Learners' first language (s)**	**Target language (s)**	**Test(s)**	**DTP**	**E**	**Relevant information**
Castro Huertas and Navarro parra (2014)	18	Spanish	English	No formal vocabulary test	Three months	+	• Elementary school pupils • Authentic materials (children´s songs, e.g., *Hello, what´s your name? Ten little Indian boys, The colors*) • Vocabulary acquisition observed through song repetition, visual cues, and imitation • Improvement in pronunciation and basic oral communication • No formal vocabulary tests, instead field notes, video recordings, student artifacts, teacher observations • Elementary school

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
Yousefi et al. (2014)	60	Malay	English	Written	Two months and 11 days	+	• Only girl students of a junior high school • Self-developed written test
Good et al. (2015)	38	Spanish	English	Written	Two weeks	+	• Test consisted of recalling lyrics verbatim, pronouncing English vowel and consonants sounds, and translating target terms from English to Spanish • Song advantage persevered after a 6-month delay • Elementary school pupils • Four learning sessions and 3 testing sessions over a 2-week period • Four-line novel lyrical passage

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
							• No authentic materials (four-line novel lyrical passage)
Heidari and Araghi (2015)	68	Turkish	English	Written	17 weeks	-	• The control group was taught the same content using pictures • Male participants only
Tegge (2015)	105	German, Dutch, Serbian	English	Written (MC; BF, free recall)	One lesson	+	• Advanced and intermediate learner groups • Two control groups with poem and prose condition • Focus on verbal recall • Songs are appropriate even for beginners (Tegge, 2017) • University EFL students

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
Kuśnierek (2016)	28	Polish	English	Written	Two weeks	+	• Vocabulary recall • Elementary school classroom • Attitude questionnaire: lyrics-based lessons were highly enjoyable

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
Shakerian et al. (2016)	60	Persian	English	Written	Two months	+	• Oxford Quick Placement test, custom-developed vocabulary tests based on the lyrics of the selected pop songs (30-item tests for vocabulary recall and retention), attitude questionnaire • 20 sessions over approximately 2 months (1.5 hours per session; 3 pop songs per session in the experimental group) • Musical group significantly outperformed the control group on vocabulary recall and retention tests • Male learners outperformed females in immediate vocabulary recall

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
							• The musical instruction led to more positive attitudes toward learning • Retention gains persisted after one month • Authentic pop songs were used
Javadi-Safa (2018)	60	Persian	English	Written	20 weeks	+	• Male participants only • Self-developed post-test (BF, true-false questions, short answers)

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
Luo (2019)	15	Chinese	English	Written	One lesson (40 minutes)	+	• Senior high school students • Meaning, spelling, pronunciation • Interviews • Self-developed vocabulary test
Pavia et al. (2019)	300	Thai	English	Written (MC)	5 weeks	+	• Spoken cues for the test • Incidental learning of vocabulary • "Learners can incidentally learn L2 vocabulary though listening to songs [but with] relatively small learning gains" (Pavia et al., 2019, p. 17). • Vocabulary Level Test • 60 minutes per session, once per week

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
Tomczak and Lew (2019)	31	Polish	English	Recall Test	One lesson (45 minutes)	+	• Mean age= 18 • They tested MWU learning • Delayed post-test (after 1 week)
Chen (2020)	84	Chinese	English	Written (MC)	Three weeks	o	• Familiar melodies facilitated better vocabulary acquisition • Three songs from cartoon movies • No MWUs but individual words • Four groups: chanting, singing, music video without caption, music video with caption • Chanting best for long-term retention; singing for short-term gains; video and captions showed consistent ef-

Study	*N*	Learners' first language(s)	Target language(s)	Test(s)	DTP	E	Relevant information
							fects; video-only condition least effective • Elementary school • Investigation of only form-meaning vocabulary knowledge • Lack of detail on singing condition: number of repetitions, exposure duration, and whether vocal training was involved were unspecified

While Tables 3 and 4 accurately reflect empirical study of music-based instruction for L2 and EFL vocabulary learning, several methodological limitations merit attention. One frequent issue is the brevity of intervention phases. For instance, Legg (2009) and Tomczak and Lew (2019) administered post-tests after only one instructional session, making it difficult to assess long-term retention. Another limitation is the absence of delayed post-tests.

Only a minority of studies evaluated learners' retention over extended periods, leaving the durability of observed gains uncertain. Similarly, a number of studies lacked control groups altogether, reducing the generalizability of findings across settings and populations. In some cases (e.g., Javadi-Safa, 2018), no pre-tests were administered, making it impossible to verify group equivalence at the outset—a crucial step for attributing observed differences to the intervention itself. Together, these

limitations underscore the need for more rigorously designed studies to confirm and expand on the promising findings observed in the current body of research.

2.4 Addressing the Research Gap: Rationale and Challenges

Despite decades of empirical and theoretical advancements, vocabulary instruction in EFL continues to be perceived as monotonous, cognitively taxing (Haß et al., 2017; Nation, 2013b; Sambanis & Böttger, 2016; Schmitt, 2008; Van Lier, 1988; Webb & Chang, 2012a, 2012b), and-most notably-inefficient (Barnard, 1961; Kersten, 2010; Nurweni & Read, 1999; Quinn, 1968; Webb & Nation, 2017). This inefficiency is particularly evident during the early stages of language education, where learners often struggle to acquire even the most frequently used vocabulary, despite substantial instructional time and effort (Barnard, 1961; Grimm et al., 2015; Nurweni & Read, 1999; Quinn, 1968; Webb & Nation, 2017).

One of the core challenges contributing to this inefficiency is the emotional strain commonly experienced by learners-conceptualized in the literature as foreign language anxiety (Almurshed & Aljuaythin, 2019; Dolean, 2016; Getie, 2020; Russell, 2020). Distinct from general classroom anxiety, foreign language anxiety arises from learners' perceived inability to manage the demands of a new linguistic system (Dewaele & Alfawzan, 2018). Elevated anxiety levels have been shown to impair communicative confidence, reduce cognitive flexibility, and diminish engagement with instructional input (Bonilla-Salazar, 2019; MacIntyre & Gardner, 1991), ultimately compromising vocabulary retention and overall language development.

In response to these challenges, music—particularly authentic English pop songs—has gained recognition as a promising pedagogical resource that addresses this affective dimension of vocabulary learning. Research demonstrates that music can reduce foreign language anxiety (Dolean & Dolean, 2014; Horwitz et al., 1986) and increase motivation by offering culturally familiar content, emotionally resonant themes, and meaningful linguistic exposure (Ahlers, 2019; Feng, 2016; Haß et al., 2017; Medienpädagogischer Forschungsverbund Südwest, 2023; Miranda, 2013). Moreover, emotional engagement has been shown to significantly enhance memory and recall, as affective states are deeply tied to long-term retention (Altenmüller, 2006; Bolitho et al., 2003; Brown, 2000; Eschrich et al., 2008; Grimm et al., 2015; Krüger, 2011, 2014; Luckner, 2007; Meier, 2010; Sprenger, 1999).

Beyond the affective aspect, according to the cognitive and neuroscientific foundations outlined above, music—particularly in the form of vocal training—could further foster MWU learning through multiple interrelated mechanisms. At the cognitive level, music enhances memory, attention, and auditory processing, all of

which are critical for the acquisition and retention of MWUs. From a neuroscientific perspective, singing activates bilateral and multimodal brain networks involved in language processing, including Broca's and Wernicke's areas, the auditory cortex, and motor planning regions (Altenmüller et al., 2000; Gordon et al., 2010; Kölsch et al., 2002; Patel, 2011). This overlap is especially evident in vocal training, which engages auditory—vocal networks across both hemispheres, supporting the encoding and chunking of lexical items into structured and retrievable MWUs (Arbib, 2013; Thaut et al., 2005; Wallace & Rubin, 1991).

Additionally, vocal training promotes the simultaneous processing of melody, rhythm, and language, thereby stimulating multimodal neural activation (Abbot, 2002; Engh, 2013; Overmann, 2005). The right hemisphere primarily processes melody while the left handles linguistic content (Carroll, 2000; Guglielmino, 1986), facilitating the formation of interconnected memory traces. Moreover, rhythmic cues in music have been shown to align neural oscillations with external auditory patterns (Fotidzis et al., 2018), enhancing attentional focus and timing-key mechanisms described in the Dynamic Attending Theory. These rhythmic patterns improve the detection of phonemes and syllables in language, thereby facilitating segmentation and recall (Bower, 1970; Kelly & Rubin, 1988; Vanden Bosch der Nederlanden et al., 2020).

Despite the promising affective, cognitive, and neuroscientific foundation of a music-based approach for MWU learning, empirical validation are scarce, contradictory and present methodological, contextual, and conceptual limitations. Although studies such as Legg (2009), Salcedo (2010), and Good et al. (2015) reported significant vocabulary gains following a music-based approach, other investigations (e.g., Chen, 2020; Heidari & Araghi, 2015; Medina, 1990) found no advantage compared to non-music-based approaches. Furthermore, the existing literature has primarily targeted L1 learners (e.g., Bannard & Matthews, 2008; Arnon & Clark, 2011) or adult L2 learners (e.g., Arnon & Snider, 2010; Arnon & Priva, 2014), thereby neglecting school-aged EFL learners who may benefit most from early MWU exposure. This research gap is further mirrored in curricular and pedagogical practice. MWUs remain underrepresented in widely used EFL teaching materials, which frequently rely on decontextualized, word-level instruction and traditional present-practice-produce paradigms that are misaligned with contemporary findings from cognitive linguistics, psycholinguistics, and neuroscience (Wood, 2010).

A major limitation across this body of research is the restricted ecological validity of many studies. The majority were conducted in laboratory settings or in idealized classrooms employing atypical instructional resources such as purpose-composed songs or highly scaffolded teaching sequences. As a result, their findings may

not generalize to real-world EFL contexts, where instructional time, resources, and curricular flexibility are often constrained. Only a small number of quasi-experimental studies—namely, those by Medina (1990), Good et al. (2015), and Chen (2020)—examined music-based vocabulary learning under authentic classroom conditions. However, all three were conducted at the primary level and focused on single-word vocabulary gains rather than MWUs, leaving adolescent and secondary-level learners notably underrepresented.

Beyond contextual limitations, many studies also exhibit methodological constraints. Several interventions were of minimal duration, sometimes consisting of only a single instructional session (e.g., Luo, 2019; Tegge, 2015), thus limiting conclusions regarding long-term retention. Moreover, few studies implemented delayed post-tests or included robust control groups, and some lacked pre-tests altogether (e.g., Javadi-Safa, 2018), preventing verification of baseline equivalence and undermining internal validity. An additional methodological limitation in the existing literature lies in the absence of standardized statistical reporting. As previously outlined, many studies either omit effect size calculations or provide insufficient inferential data, limiting the interpretability, comparability, and replicability of results. Even relatively methodologically sound studies, including Medina (1990), Good et al. (2015), and Chen (2020), did not report effect sizes, thus reducing their utility for meta-analyses and evidence-based instructional planning.

Taken together, these limitations highlight the need for rigorously designed, classroom-based studies that investigate the long-term impact of music-based approach (vocal training), INMI and well-being on MWU learning among adolescent EFL learners. While such approaches offer pedagogical promise, their success is contingent on multiple musical and linguistic factors.

From a musical perspective, individual tastes and preferences significantly influence the effectiveness of songs in language learning. Music that aligns with personal preferences has been shown to enhance functional brain connectivity, facilitating the integration of new information into long-term memory (Hodges & Wilkins, 2015). Conversely, disliked music may trigger negative emotions, raising stress levels and disrupting connections to memory-related areas such as the hippocampus (Medina, 2002; Overmann, 2005). Krashen's Affective Filter Hypothesis (1985a) reinforces this point, suggesting that negative emotional responses elevate the affective filter and inhibit language intake.

From a linguistic standpoint, pop songs often present challenges in terms of comprehension and lexical coverage. Learners frequently sing foreign language lyrics without understanding their meaning (Laufer, 2020; Sommer, 2016), and even when lyrics are memorized, they may not be fully integrated into learners' active

vocabulary. Research shows that 95-98% lexical coverage is needed for adequate comprehension of authentic texts (Hu & Nation, 2000; Nation, 2006; Schmitt et al., 2011; Stæhr, 2008). While Murphey (1987, 1989, 1990a, 1992) contended that pop songs contain accessible vocabulary and high repetition, Tegge's (2017) analysis of over 1,000 songs found that knowledge of the 3,000 most frequent word families is required to achieve 95% coverage—indicating that many songs may still exceed beginner proficiency levels. In addition, authentic lyrics may contain non-standard grammar, irregular stress patterns, and thematically inappropriate content (Coe, 1972; Jolly, 1975; Richards, 1969; Spears, 1998). Figurative language and abstract expressions common in lyrics can further hinder comprehension for younger or less proficient learners (Webb & Nation, 2017). However, careful song selection can mitigate these issues, with teachers playing a key role in aligning materials to learners' needs and levels (Jolly, 1975; Richards, 1969).

From a cognitive perspective, the dual-task nature of processing both melody and language can result in cognitive overload. Singing demands greater cognitive effort than speaking or reciting, and unfamiliar or complex melodies may draw attention away from linguistic content (Calvert & Bellingsley, 1998; Medina, 2002). Studies have shown that melody can interfere with text recall, particularly when learners fail to retrieve one line, thereby disrupting subsequent sequences (Racette & Peretz, 2007; Speelman et al., 2012). While rhythm and melody may support sequencing and chunking, they also impose additional memory demands that need to be carefully balanced.

From an educational perspective, intensive short-term interventions using songs can lead to the "cramming effect," where vocabulary is quickly learned but not retained over time (Webb & Nation, 2017). Long-term acquisition requires repeated and spaced encounters with target language items (Harry et al., 1993; Webb & Nation, 2017).

In conclusion, although vocal training with authentic pop songs holds considerable pedagogical potential for MWU learning, its effectiveness depends on a careful alignment between learner preferences, cognitive load, linguistic accessibility, and instructional design.

CHAPTER 3: METHODOLOGY

3.1 Research Design

This research investigated the impact of a music-based approach—specifically, vocal training with selected pop songs—on the learning of multi-word units (MWUs) in comparison to a no music- based approach. Additionally, it examined how this approach influences learners' well-being and the occurrence of INMI as well as the extent to which these factors contribute to MWU learning. To ensure a rigorous and comprehensive evaluation, the research follows a two-phase research design, allowing for a progressive refinement of methodology, statistical analyses, and instructional strategies.

The first study served as an initial exploration, employing a within-subjects design to assess whether a music-based approach could significantly improve MWU learning. It included both a pre-test (T0) and an immediate post-test (T1). It aimed to examine the feasibility of implementing a music-based instructional intervention focused on MWUs and to pilot instruments related to well-being and INMI. This phase also informed the development of the vocabulary test, training materials, and analysis procedures.

Building upon these initial findings, the second study was designed to address the limitations of the first study while offering a more comprehensive evaluation of the intervention's effects. This phase introduced key methodological refinements, including a larger sample (N = 212), a delayed post-test (T2), and a control group, allowing for direct comparisons between music-based and non-music-based approaches. Moreover, the second study incorporated statistical improvements to increase analytical rigor, ensuring more reliable effect size estimates and reducing confounds related to prior English MWUs knowledge ad individual differences. Beyond MWU learning, the second study systematically examined the influence of well-being and INMI on MWU learning.

To support a nuanced interpretation of findings, five learner-related variables were examined as potential moderators or mediators of intervention outcomes: gender, first language (L1)/bilingualism, exposure to English, exposure to pop songs, and musical training. These variables were selected based on empirical and theoretical frameworks outlined in Chapter 2.

Gender was included as a potential explanatory variable due to its relationship with cognitive strategies, memory systems, and educational outcomes. While gender-based differences are often small, understanding their role in language learning—particularly in contexts involving music and memory—is essential for interpreting interindividual variation.

L1 background and bilingualism were analyzed to account for learners' prior linguistic experience and its influence on L2 vocabulary uptake. These factors may affect learning burden, phonological familiarity, and lexical transfer processes, thereby shaping MWU acquisition.

Extramural exposure to English was included to control for language contact outside the classroom. Given its increasing relevance in digital and media-rich environments, such exposure—particularly through informal channels—can contribute to incidental vocabulary learning and influence learners' baseline proficiency.

Exposure to pop songs was examined as a distinct variable due to its potential to reinforce lyrical input and facilitate memory through repeated auditory exposure. Familiarity with English-language pop songs may enhance engagement and lexical uptake during the intervention.

Finally, musical training was included to assess the possible cognitive advantages associated with systematic musical practice. Skills such as auditory discrimination, rhythmic processing, and verbal memory—often enhanced in musically trained individuals—may support the learning and retention of sung MWUs.

Together, these variables support a comprehensive analysis of the cognitive, linguistic, and experiential dimensions underlying vocabulary acquisition in music-based instruction. Their inclusion allows for a more differentiated interpretation of the intervention's effects across learner subgroups.

3.2 Participants

Data collection took place in four secondary schools in North Rhine-Westphalia (NRW), Germany—two grammar schools and two comprehensive schools—with sixth-grade pupils aged 10 to 13. In the German school system, the sixth grade represents the second year of secondary education, following four years of primary school. Depending on the federal state, school pupils progress through a 12- or 13-year education system. The fifth and sixth grades together form the "preparation phase," also known as "trial period" (*Erprobungsstufe*). During this phase, the suitability of the initial school type chosen by parents, pupils, and primary school teachers—*Gymnasium* (equivalent to grammar school, focusing on preparing students for university with a rigorous academic curriculum), *Gesamtschule* (comprehensive school combining elements of *Gymnasium*, *Realschule*, and *Hauptschule*), *Realschule* (a secondary school offering a mix of academic and vocational education), or *Hauptschule* (a general secondary school focusing on basic education and practical skills, often leading to apprenticeships)—is carefully assessed (§ 13, Subsections 2, 5, Schulgesetz NRW, 2005 [School Act NRW]; §§ 4, 10-12, Ausbildungs- und

Prüfungsordnung Sekundarstufe I [APO- S I, 2012]; Ministry for Schools and Education, the State of NRW, 2014a, p. 3).

The transition from primary to secondary school is a pivotal moment in a student's educational trajectory. Rumlich (2016) highlights the complexity of this process, in which parents, guided by detailed performance evaluations and recommendations from primary school teachers, select a secondary school type for their children. In NRW, these recommendations are not legally binding, giving parents the ultimate authority in the decision-making process. Parental choices are often shaped by a combination of academic considerations, socio-economic background, educational aspirations, and the reputation of the school. Children also influence the decision, drawing on their own preferences, peer choices, and family experiences (Brademann, 2009).

Despite the theoretical permeability of the German school system, transitions between school types tend to perpetuate socio-economic divisions. Students from families with higher educational backgrounds are more likely to attend *Gymnasium*, which has seen a steady rise in enrollment over the decades. For example, the percentage of primary school students transitioning to *Gymnasium* in NRW increased from 23.8% in 1970 to 41.8% in 2013 (Baumert et al., 2010; MSW NRW, 2014i). This trend has contributed to greater academic heterogeneity at *Gymnasium*, as noted by both primary and secondary school educators.

The trial period also plays a critical role in the selection process at *Gymnasien*. Decisions such as repeating a school year or transferring to a different type of school are primarily based on academic performance, though social and other factors may also be considered. These transitions can occur voluntarily at the request of parents, often based on a teacher's recommendation, or may be mandated by the school (Rumlich, 2016). Notably, nearly 50% of students leaving *Gymnasien* and over 75% transferring to *Gymnasien* during lower secondary education do so during or immediately after the Erprobungsstufe. As students move into year 7, decisions about promotion to the next grade are made by the *Versetzungskonferenz* ("moving- up conference"), comprising all teachers who taught the pupil during the school semester (§ 50, Subsection 2, SchulG NRW; MSW NRW, 2014a). Beyond the trial phase, § 12 of the SchulG NRW emphasizes that changes in school type or course of study should be rare and require collaboration among students, parents, and teachers to ensure stability in student's educational path (SchulG NRW, 2005).

The decision to conduct this research with secondary school pupils was guided by both theoretical and empirical considerations. As outlined in Chapter 2, a notable gap exists in the literature regarding music-based vocabulary instruction for this age group, with most studies focusing on adult or university learners. In addition to ad-

dressing this gap, the choice was supported by findings from Webb and Chang (2012b), who observed that younger learners tend to show higher levels of motivation when engaged in enjoyable, interactive activities such as songs and games. Furthermore, children are generally more tolerant of partial comprehension during language exposure, often perceiving even limited understanding as sufficiently rewarding to sustain their engagement and participation in learning tasks. From a neurocognitive perspective, their brains exhibit greater plasticity (Bates et al., 2001; Kolb, 1999), and their cognitive functions are more susceptible to environmental shaping and experiential input (Dawson et al., 2000; Johnson & Newport, 1989; Taylor & Alden, 1997). Classic theories by Penfield and Roberts (1959) and Lenneberg (1967) further support the view that children possess a natural predisposition for acquiring both first and second/foreign languages, making them an especially relevant population for investigating the effects of music-based vocabulary instruction.

3.3 Procedure

The intervention consisted of eight English lessons implemented over a two-week period, with additional sessions allocated for the administration of pre- and post-tests and pre- and post-questionnaires. The two-week intervention—comprising eight English lessons—was strategically selected based on educational research, neuroscientific findings, and insights gained from the first study. From an educational standpoint, Medina (1993) conducted a study involving four English lessons delivered over four consecutive days and she found no significant improvement in vocabulary acquisition as measured by a multiple-choice test. In her discussion, she acknowledged that "exposure to music … occurred over 4 days, yet this may not have been sufficient time to observe a change in the student's ability to acquire vocabulary" (p. 21). In contrast, Good et al. (2015) implemented a two-week intervention with four instructional sessions and three testing sessions, reporting significant gains in vocabulary recall, pronunciation, and translation among participants in the music-based group relative to a control group that received non-musical instruction. These findings suggest that although the number of learning sessions in both studies was comparable, the broader time span in Good et al.'s design may have been critical for consolidating learning outcomes.

Additional support for the two-week timeframe comes from studies by Kuśnierek (2016) and Alipour et al. (2012), both of which employed two-week interventions, reporting positive outcomes for learners exposed to music-based approaches compared to those in control conditions. Collectively, this body of research indicates that a single week of instruction may be insufficient for facilitating signif-

icant vocabulary gains, whereas a two-week period offers a more effective timeframe for fostering vocabulary acquisition and retention.

The decision was further informed by the findings of the first study. The moderate effect observed (Cohen's $d \approx 0.5$) suggests that a two-week duration is appropriate for examining the efficacy of music-based approach in real-world educational settings.

Although this study does not aim to measure neurophysiological changes such as event-related potentials (ERPs), neuroscientific findings were considered in establishing the intervention length. Lappe et al. (2008) demonstrated that two weeks of musical training in young adults produced measurable changes in ERP responses—specifically an enhancement in the P2 component, a positive wave occurring approximately 150-250 milliseconds after stimulus onset. The P2 increase is associated with auditory perceptual learning and neural plasticity, indicating that even brief training can induce cortical adaptations. These findings support the plausibility of observing measurable cognitive or behavioral changes—such as gains in vocabulary learning—within a two-week intervention.

Finally, the selected intervention length reflects pragmatic considerations within the school context. Two hours were allocated prior to the intervention for orientation and administration of the pre-test (T0), and another two hours followed the intervention for post-test (T1), delayed post-test (T2), and final questionnaires. This four-hour commitment, in addition to the instructional sessions, represented a feasible arrangement for schools operating under rigid curricular constraints. In the German secondary education system, teachers are required to cover specific competencies, grammatical structures, and vocabulary items throughout the academic year (August–July), while sixth-grade pupils must also complete six textbook units. Extending the intervention beyond two weeks would have posed significant logistical challenges, likely disrupting instructional planning and curriculum coverage. The two-week design thus represents a carefully balanced solution that aligns educational goals with methodological robustness and practical feasibility.

Participants were assigned to either a test group (music-based approach) or a control group (non-music-based approach). The decision to exclude a rhythm-only control group was grounded in robust empirical evidence provided by Hébert and Peretz (1997), Yalch (1991), and Ludke et al. (2013). Hébert and Peretz (1997) demonstrated that the most effective access to long-term musical memory relies on the combination of rhythm and melody, with melody playing the more effective role. Their findings revealed that rhythm alone serves as a weak retrieval cue, whereas melody provides the minimal structure necessary to activate stored musical representations (p. 528). Across three experiments, they concluded that music identifica-

tion is most accurate when melodic and rhythmic cues are combined, as "melodic information in isolation is often not enough for a perfect match with memory; temporal structure must be included" (p. 529). Consistent with these findings, Yalch (1991) found no evidence of enhanced familiarity or mnemonic benefit in rhythm-only conditions. Similarly, Ludke et al. (2013) observed that participants in the rhythmic-speaking condition performed worse than those in the singing condition, further underscoring the central role of melody in music-assisted memory tasks. Based on this body of evidence, the inclusion of a rhythm-only group was deemed unnecessary. This decision reflects a careful review of the literature and reinforces the methodological integrity and theoretical grounding of the current study.

Both the test and control groups were exposed to the same MWUs through identical instructional content, ensuring comparability in both materials and instructional conditions. However, the instructional approach differed: the test group underwent a vocal training, whereas the control group listened to the pre-recorded spoken versions of the same lyrics and recited them aloud. To ensure consistency across groups, the pre-recorded spoken version of the song lyrics was matched in length and exposure to the sung version. The spoken recordings were produced by two native English speakers—one male and one female—selected to match the original singer's gender for each song. Neither native English speaker had formal musical training. Throughout the intervention, teachers carefully monitored exposure time. Music teachers were responsible for teaching lessons to the test groups, ensuring that the vocal training components were implemented correctly.

In addition to ensuring consistent instructional delivery, it was essential to define a vocabulary load that was both pedagogically manageable and empirically grounded. Vocabulary load is a key construct in vocabulary acquisition research (Hu & Nation, 2000; Nation, 2009, 2014; Nation & Deweerdt, 2001; Schmitt et al., 2011), yet studies offer limited consensus on how much vocabulary—particularly MWUs—learners can realistically acquire under varied instructional conditions. To address this, the current study introduced a fixed load of five MWUs per lesson, totaling forty target items across eight instructional sessions. This choice reflects a cautious approach informed by recommendations in the literature: Coleman (2014) suggests no more than ten items per lesson; Vinzentius (2007) proposes seven to twelve for younger learners; Thaler (2018) allows for up to fifteen for productive use; and Nation (2013b) recommends a maximum of six. These variations underscore the need to tailor vocabulary load to the learner group and instructional format.

Given the lack of consistency in how vocabulary growth is measured—ranging from lemmas and word families to MWUs, often without clearly defined units (Webb & Nation, 2017)—this study adopted transparent criteria and uniform assess-

ment procedures. Vocabulary knowledge was evaluated through two tasks: a fill-in-the-gap task and a written production task, each targeting ten MWUs. Together, these tools assessed 50% of the instructional vocabulary, providing a balanced measure of both receptive and productive knowledge while avoiding lexical overload.

The number of exposures to each target item was similarly informed by prior empirical findings. Research supports the role of repetition in vocabulary retention but varies in estimating optimal exposure frequency (Elley, 1989; Laufer & Rozovski-Roitblat, 2011; Pellicer-Sánchez & Schmitt, 2010; Stahl & Fairbank, 1986). Estimates range from as few as five to as many as twenty or more exposures, depending on task type and processing depth (e.g., Brown et al., 2008; Nation, 2001, 2014; Pellicer-Sánchez, 2016; Saragi et al., 1978; Van Zeeland & Schmitt, 2013b; Vidal, 2011; Waring & Takaki, 2003; Webb, 2007a, 2007b). Based on this body of evidence, each MWU in the intervention was repeated six times: three times in the second listening session and three in the third. This frequency represents a moderate, research-informed threshold, designed to balance cognitive manageability with the consolidation of lexical knowledge.

To maximize repetition density, MWUs were drawn from structurally repetitive sections of the selected pop songs—primarily choruses and pre-choruses. These sections typically offer multiple natural repetitions within a song and align with musical elements known to facilitate verbal recall. Additional reinforcement was provided through echoic elements in the bridge and final chorus. This selection strategy was pedagogically intentional, supporting both the cognitive processing and musical engagement of adolescent EFL learners.

To evaluate the impact of this structured exposure, the study measured pupils' MWU learning at three distinct points in time. Assessment took place prior to the intervention with a pre-test (T0), immediately after the intervention with a post-test (T1), and two weeks after T1, when a second follow-up test (T2) took place. All three tests were identical and administered identically (Nation & Webb, 2011). Each test measured both productive and receptive knowledge of MWUs according to Nation's (2013b) multidimensional vocabulary competence model. The implementation of a follow-up test (T2) was chosen because immediate post-tests often reveal an effect directly following treatment; however, they may not reflect robust learning that endures over time. In this regard, Schmitt (2010) highlighted the need for a delayed post-test in vocabulary learning research, noting that immediate post-test results are limited since they ignore the fact that learning is "always liable to attrition" (Schmitt, 2010, p. 155) and provide only a temporary snapshot of vocabulary knowledge. This limitation restricts the generalizability of immediate post-test scores. Schmitt further argues that initial practice tends to be more effective than subsequent practice ses-

sions, meaning that relying solely on immediate post-tests may overestimate the effects of practice and underestimate durable learning.

The two-week interval between T1 and T2 follows certain theoretical recommendations rather than an empirically defined rationale. While Schmitt (2010) suggests a delay of three weeks but no less than one week, Nation and Wang (1999) propose that a two-week gap is particularly suitable for a delayed post-test.

To ensure both ethical integrity and statistical robustness, all pre- and post-questionnaires related to well-being and INMI, along with the vocabulary tests (T0, T1, and T2), were conducted in pseudonymized form. This deliberate choice allowed for the protection of pupil privacy while maintaining the ability to link individual responses across testing phases for accurate longitudinal analysis. Pseudonymization was selected over full anonymization to preserve analytical flexibility, particularly in view of the presence of specific conditions among some participants—such as attention deficit hyperactivity disorder (ADHD), reading and spelling disorders, and auditory perception deficits. These conditions may necessitate the exclusion or statistical adjustment of affected data, especially if the number of such cases becomes substantial relative to the total sample. Unlike anonymization, which irreversibly removes identifiers and would have prevented meaningful subgroup analyses, pseudonymization ensures that privacy is safeguarded while preserving data integrity for analysis.

Each student generated a unique pseudonym code based on a combination of personal but non-identifiable elements: the first two letters of their first name, the third and fourth letters of their surname, the last two digits of their birth year, and the final two digits of the postal code of their school's location. This code was defined collectively in class prior to the start of the intervention and remained consistent throughout the study.

Prior to data collection, both children and their parents were fully informed about the study procedures, including those relevant to their specific conditions. In accordance with ethical guidelines, children provided written consent, demonstrating their autonomy in choosing to participate. To ensure consistency and engagement with the intervention, students were informed that missing more than one session would result in their exclusion from the intervention. The implementation of the research study is summarized in the following table.

Table 5. *Timeline and Structure of the Intervention*

Schedule	**Session overview**
Introduction Presentation Double Lesson	Introduction to the series of classes Assignement of student codes (pseudonymization) Song previews, group assignments and expert group formation (three-four pupils) Demographic Test **T0** Explanation of steps for preparing the presentation, cards for the presentation, today's multi-word units worksheet
1. lesson	Singing (vocal training) vs. speaking (recitation)
2. lesson	Singing (vocal training) vs. speaking (recitation)
3. lesson	Singing (vocal training) vs. speaking (recitation)
4. lesson	Singing (vocal training) vs. speaking (recitation)
5. lesson	Singing (vocal training) vs. speaking (recitation)
6. lesson	Singing (vocal training) vs. speaking (recitation)
7. lesson	Singing (vocal training) vs. speaking (recitation)
8. lesson	Singing (vocal training) vs. speaking (recitation)
Test	**T1** Questionnaire post-intervention Evaluation of the series of classes

Schedule	Session overview
Test	**T2** (two week- after T1)

To preserve the integrity of the experimental design, a preliminary assessment was conducted before administering the demographic questionnaire and T0. Students were exposed to 15-second previews of the eight songs included in the intervention materials. This measure was designed to screen for any prior familiarity with the melodies, which could compromise the validity of the results.

Considering that the teacher's attitude towards an approach can significantly impact its effectiveness, addressing and mitigating potential research bias is essential, particularly the "teachers investigating their classes" issue highlighted by Altrichter and Posch (1998). Teacher attitudes can also trigger what is referred to as a "reciprocal effect" or "arousal effect." As described by Tausch and Tausch (1975), "Feelings, emotional reactions, and attitudes of one person often trigger similar (reciprocal, corresponding) processes, feelings, and emotional moods between persons through perception" (p. 159). A teacher's attitudes and behavior are often unconsciously transferred to students, influencing the classroom atmosphere and potentially affecting learning outcomes. To minimize these biases, the primary researcher taught only two classes—one from the first study and one test group. The remaining classes were taught by qualified secondary school English teachers, while certified music teachers instructed the other three test groups. All teachers received detailed instructions and followed lesson outlines developed specifically for this study. This was intended to ensure instructional consistency and minimize the influence of individual teacher attitudes on the learning process and outcomes.

Table 6. *Teacher Assignments, Participating Schools, and Implementation Timeline*

Public secondary schools	**T 1**	**T 2**	**T 3**	**T 4**	**T 5**	**T 6**	**T 7**	**T 8**	**T 9**
Comprehensive school 1 (16.10.2023- 27.10.2023)	FS	FS							
Grammar school 1 (20.11.2023- 02.12.2023)	TG		CG						

Public secondary schools	T 1	T 2	T 3	T 4	T 5	T 6	T 7	T 8	T 9
Comprehensive school 1 (26.02.2024- 08.03.2024)				CG	TG				
Comprehensive school 2 (11.03.2024- 22.04.2024)						TG	CG		
Grammar school 2 (22.04.2024- 06.05.2024)								TG	CG

Note. *T = Teacher; FS = First Study; TG = Test Group; CG = Control Group.*

At the beginning of the intervention, pupils filled out the demographic test to address the five main variables of the research study: L1/bilingualism, exposure to pop songs, musical training, gender, and exposure to English. Additionally, the study accounted for other (secondary) variables such as a preference for pop music, exposure to English music, self-perceived song listening comprehension, perceived music benefits before and after the intervention, selected pop song preference, self-perceived approach efficacy, willingness to adopt the approach after the intervention. The age variable was not considered due to the homogeneous age range of the participants, who were sixth-grade pupils (11-13 years old).

3.3.1 Instructional Phases and Lesson Plan

To structure the lesson plan, Nation's (2008) theory of the four strands was adopted as a guiding framework. According to this model, a well-balanced language course should integrate four strands of learning: (1) meaning-focused input, (2) meaning-focused output, (3) language-focused learning, and (4) fluency development. Each of these strands should ideally receive approximately 25% of instructional time to ensure comprehensive coverage of both receptive and productive language skills (Nation, 2008, pp. 8–9).

The first strand, meaning-focused input, emphasizes learning through listening and reading. To be effective, this input should be comprehensible and contain a manageable proportion of unfamiliar vocabulary. The second strand, meaning-focused output, involves learning through speaking and writing, thereby requiring learners to actively retrieve and apply vocabulary in communicative contexts. The third strand, language-focused learning, centers on the deliberate study and teaching

of linguistic features such as vocabulary, pronunciation, and grammar. The fourth strand, fluency development, focuses on practicing language with familiar content at a pace that encourages automatic processing, aiming to increase speed and ease of language use. Nation (2008) also notes that, particularly in the early stages of learning, greater emphasis may be placed on language-focused learning before transitioning to fluency development.

In parallel with this framework, Nation (2001) identifies three core processes essential to effective vocabulary learning: noticing, retrieval, and creative use. These processes are central to the instructional decisions made in this intervention. Noticing refers to the learner's conscious attention to a new word or structure. Retrieval involves recalling a word after its initial introduction, which can be receptive (recognizing and recalling its meaning) or productive (actively using it to communicate). Repeated retrieval enhances the durability of lexical knowledge by reinforcing form-meaning connections. The final process, creative or generative use, entails applying known vocabulary in novel contexts, thereby deepening learners' understanding and promoting transferability.

The lesson plan presented below is structured to align with Nation's four strands while also fostering the cognitive mechanisms of noticing, retrieval, and creative use. Each phase has been intentionally sequenced to promote repeated encounters with the target MWUs across multiple input and output modalities. The following table provides a comprehensive overview of the lesson structure, detailing the instructional phases, learner activities, pedagogical functions, strands addressed, and the theoretical foundations informing each component. Each phase is then elaborated in the subsequent sections.

Table 7. *Overview of Lesson Phases and Instructional Design*

Lesson phase (time in minutes)	**Activities (social form)**	**Instructional function (Nation, 2001)**	**Learning process strand (Nation, 2008)**	**Academic references (A- L)**	**Academic references (M- Z)**
Warm-up phase (3)	The pupils listen to the song (in the test group) or to the record (in the control group) without lyrics (individual work)	Noticing	Meaning-focused input	• Calvert & Billingsley (1998) • Lozanov (1978)	• Macedonia (2014) • MacLachlan (2009) • Maier (2010) • Medina (2003) • Müller et al. (2016) • Murphey (1990b) • Nation (2001, 2017) • Racette & Peretz (2007) • Richards (1969) • Sambanis &

Lesson phase (time in minutes)	Activities (social form)	Instructional function (Nation, 2001)	Learning process strand (Nation, 2008)	Academic references (A- L)	Academic references (M- Z)
					Böttger (2018; 2020) • Wallace & Rubin (1991)
Presentation phase (10)	The expert group (three-four students) presents and teach the MWUs of the day. They introduce new MWUs by demonstrating pronunciation, spelling, word structure, and form-meaning relationships through L1 translation. They	• Noticing (for the class) • Productive retrieval (for the expert group) • Elaboration	• Meaning- focused input (for the class)/ meaning • Focused output (for the expert group) • Language- focused learning	• Altarriba & Knockerbocker (2011) • Boers et al. (2006) • Brewster & Ellis (2003) • Butzkamm (2002) • Cobb (2007) • Ellis (1989) • Ellis & Beaton (1993) • Graves (1986) • Haß et al. (2017) • Hulstijn (2001; 2013)	• Meara et al. (1990) • Mezynski (1983) • Morris et al. (1977) • Nation (2001, 2007, 2013a) • Newton (2013) • Rubin (1987) • Sawada (2009)

Lesson phase (time in minutes)	Activities (social form)	Instructional function (Nation, 2001)	Learning process strand (Nation, 2008)	Academic references (A- L)	Academic references (M- Z)
	also present relevant associations, grammatical functions, collocations, and usage constraints using two example sentences (group work)			• Kern (1994) • Lado et al. (1967) • Laufer (2003, 2005) • Laufer & Shmueli (1997)	• Simcock (1993) • Stahl (1990) • Thornbury (1997, 2019) • Webb (2002, 2008) • Webb & Nation (2017) • Wests (1955) • Zydatiß (2002)

Lesson phase (time in minutes)	Activities (social form)	Instructional function (Nation, 2001)	Learning process strand (Nation, 2008)	Academic references (A- L)	Academic references (M- Z)
Reproductive phase (7)	Pupils in the test group sing along with the song twice with lyrics (choral repetition). Control group pupils listen to the spoken version of the lyrics and recite along twice with lyrics (group work)	• Elaboration • Varied productive meetings	• Fluency development • Meaning- focused input • Meaning- focused output	• Anshel & Kipper (1988) • Augurzky (2006) • Barsalou (1999) • Bree et al. (2019) • Brewster & Ellis (2003) • Brown et al. (2008) • Engh (2013) • Fodor (1998) • Gagnon & Peretz (2003) • Glenberg & Kaschak (2002) • Glenberg & Robertson (2000) • Healey et al. (1976) • Hirose (2003) • Holbrook (1981)	• Maier (1995) • McConchie & Jensen (2020) • McElrea & Standing (1992) • McMillan & Chavis (1986) • Müller et al. (2016) • Nation (2013b) • Nittono et al. (2000) • Pavia et al. (2019) • Picton et al. (2000)

Lesson phase (time in minutes)	Activities (social form)	Instructional function (Nation, 2001)	Learning process strand (Nation, 2008)	Academic references (A- L)	Academic references (M- Z)
				• Horst et al. (1998) • Husain et al. (2002) • Huy (1999) • Hwang & Schafer (2009) • Jenkins & Dixon (1983) • Jenkins et al. (1984) • Jensen (1998) • Kallinen (2002) • Kilgour et al. (2000) • Lake (2003) • Lappe et al. (2008) • Lems (1996) • Lewis (2000) • Ludke et al. (2013) • Lyczak (1979)	• Pöppel et al. (2008) • Quast (1994) • Richards (1969) • Rukholm et al. (2018) • Sambanis & Böttger (2018) • Sammler & Elmer (2020) • Schellenberg et al. (2000) • Shurley (2002) • van der Zwaag et al (2011)

Lesson phase (time in minutes)	Activities (social form)	Instructional function (Nation, 2001)	Learning process strand (Nation, 2008)	Academic references (A- L)	Academic references (M- Z)
					• van Zeeland & Schmidt (2013a) • Wallace (2014) • Webb & Chang (2012a, 2015a) • Webb et al. (2013) • Webb & Nation (2017) • Zwaan & Taylor (2006)
Application phase (5 minutes)	Pupils will work on fill-in-the-gap task using the targeted MWUs (partner work)	• Varied productive use • Productive retrieval	• Meaning- focused output • Language- fo-	• De la Fuente (2002) • Foster & Ohta (2005) • Haß et al. (2017)	• Nation (2007, 2012, 2013a) • Newton (2013)

Lesson phase (time in minutes)	Activities (social form)	Instructional function (Nation, 2001)	Learning process strand (Nation, 2008)	Academic references (A- L)	Academic references (M- Z)
			cused learning • Fluency development	• Laufer & Hulstijn (2001)	• Simcock (1993)
Production phase (10 minutes)	Pupils collaboratively write a short story using the targeted MWUs (partner work)	• Varied productive use • Productive retrieval	• Meaning- focused output • Language- focused learning • Fluency development	• De la Fuente (2002) • Foster & Ohta (2005) • Haß et al. (2017) • Laufer & Hulstijn (2001)	• Nation (2007, 2012, 2013a) • Newton (2013) • Simcock, 1993
Consolidation phase (10 minutes)	Answers from task 1 are reviewed and discussed in a full-class setting. One or two stories from task 2 are presented, revised collaboratively, and	• Varied receptive meetings • Varied productive use • Elaboration	Language-focused learning	• Harmer (2004, 2007) • Lewis (1997)	• McConchie & Jensen (2020) • Nation (2008) • Nunan (1991) • Parrot (2000) • Richards &

Lesson phase (time in minutes)	Activities (social form)	Instructional function (Nation, 2001)	Learning process strand (Nation, 2008)	Academic references (A- L)	Academic references (M- Z)
	reflected upon in plenary discussion				Rodgers (2001) • Swain & Lapkin (1998) • Scrivener (2011) • Thornbury (2005) • Ur (2012)

3.3.1.1 Warm-up Phase

The first phase of the lesson plan introduced a distinctive approach for the test and control groups. While the test group listened to the song, the control group engaged with a spoken narrative version of the same lyrics, pre-recorded by male or female native speakers in alignment with the gender of the original performer. Importantly, neither group was provided with the written lyrics at this stage. This deliberate omission was intended to foster an aural-first encounter with the material, which was central to the phase's instructional goals.

The focus of this phase lay in the noticing process, defined by Nation (2001) as a learner's conscious attention to language features. Noticing, or "giving attention to a word" (Nation, 2017, p. 11), occurred primarily through listening—a foundational step in foreign language learning (Macedonia, 2014; Müller et al., 2016; Sambanis & Böttger, 2018). Listening first enabled learners to construct phonetic images of new MWUs before encountering their written forms. This sequence helped reduce subvocalization in the learner's own voice and minimized the emergence of a foreign

accent (Meier, 2020, as cited in Sambanis & Böttger, 2020, p. 205; Murphey, 1990b). By prioritizing auditory input, learners were more likely to acquire the accurate spoken form of the MWU, which is often impeded when orthographic input is introduced too early.

Additionally, this phase was designed to induce a relaxed and receptive mental state, drawing inspiration from Lozanov's Suggestopedia. By temporarily disengaging from active cognitive tasks and entering a state of passive yet attentive listening, pupils were able to achieve relaxation within two to three minutes. This created an emotionally supportive atmosphere that could contribute to the acquisition of MWUs.

In the test group, early exposure to the rhythm and melodic contour of the song played a crucial role in minimizing cognitive interference that can arise when unfamiliar melodies are introduced simultaneously with lyrics (MacLachlan, 2009; Wallace & Rubin, 1991). Richards (1969) emphasized the importance of separating these elements, stating that "the rhythm and music of the song should be established before the words are sung." Familiarizing pupils with the musical structure in advance helped reduce what Medina (2003, p. 14), Calvert and Billingsley (1998), and Racette & Peretz (2007) described as "secondary task overloading"—a cognitive burden caused by the simultaneous processing of multiple novel stimuli. By introducing melody before lyrics, the instructional design aimed to streamline cognitive load and enhance learners' ability to process linguistic content more effectively.

3.3.1.2 Presentation Phase

This phase was scheduled to last approximately 10 minutes per session, accounting for no more than 25% of the recommended instructional time for a well-balanced vocabulary learning program (Nation, 2007, 2013b; Webb & Nation, 2017). It addressed the language-focused learning strand (Nation, 2001), during which learners' attention was purposefully directed toward the targeted MWUs. Hulstijn (2001) noted that retention depends on the depth of processing: "The more a learner pays attention to a word's morphological, orthographic, prosodic, semantic, and pragmatic features and intra-word and inter-word relations, the more likely the new lexical information will be retained" (p. 15). Consistent with this view, Graves (1986) emphasized the value of deliberate vocabulary instruction prior to contextual exposure. Effective instruction involves repeated encounters and varied input, including fluency development (Mezynski, 1983) and contextualized examples (Stahl, 1990). Boers et al. (2006) added that deliberate methods are particularly effective for learning MWUs. A substantial body of research confirms that deliberate vocabulary learning

is more effective than incidental learning for long-term retention (Brewster & Ellis, 2003; Cobb, 2007; Elley, 1989; Hulstijn, 2013; Laufer, 2003, 2005; Morris et al., 1977; Webb, 2002, 2008; Webb & Nation, 2017).

This phase of the intervention was implemented identically in both the test and control groups and followed a learner-centered approach (Thornbury, 1997, p. 329). Although highly structured, it fostered foundational communicative engagement by assigning students the role of teacher. Learners introduced targeted MWUs to their peers using prepared materials, transitioning from passive exposure to active, purposeful language use within a controlled instructional framework (Butzkamm, 2002; Wests, 1955; Zydatiß, 2002; Meara et al., 1990; Rubin, 1987).

Prior to the intervention, each class was divided into expert groups consisting of three to four pupils. One student in each group was appointed as the group leader and was responsible for coordinating preparation and presenting two of the five assigned MWUs, while the remaining members each presented one. To support quality and consistency, each group prepared its material at home and submitted it to the teacher one day in advance for feedback. Presentations could be delivered live or pre-recorded, and sample presentations were made available via QR codes and in-class demonstrations. All groups followed a standardized guide entitled *Steps for the Preparation* (Appendix K), which ensured uniformity in structure and content.

To further scaffold the presentation process, pupils used pre-designed *Cards for Presentation* (Appendix K). These cards provided a structured format for delivering and processing MWUs and were informed by evidence on vocabulary instruction (Meara et al., 1990; Rubin, 1987). Each card focused on one of the four key aspects of MWU knowledge: (1) spoken form, (2) written form, (3) meaning (including L1 translation), and (4) use, presented through two contextualized example sentences. The initial set of ten cards used in the pilot study was reduced to five, reflecting learners' cognitive and linguistic needs, their A1+ to A2 proficiency levels, and logistical constraints related to time and attention span. Evaluation data from the first study indicated that the original format overwhelmed learners and compromised both the quality of presentations and the completion rate of the *Today 's Multi-Word Units Worksheet.*

On each intervention day, one expert group presented its set of MWUs to the class. As the group introduced the targeted expressions, the remaining students repeated the spoken form and completed the *Today's Multi-Word Units Worksheet* by filling in the written form, meaning (L1 translation), and usage information based on the examples provided. Completed worksheets were stored in learners' individual vocabulary portfolios, reinforcing consolidation through repetition and written engagement.

A key feature of this phase was the incorporation of L1 translation when conveying meaning. Although translation has been criticized for fostering L1 dependence and for oversimplifying semantic equivalence (Butzkamm, 2002), it remains highly effective—particularly for lower proficiency learners. As Nation (2013b) argued, "The difficulties caused by non-exact correspondence between meanings in L1 and L2 are probably less than the difficulties caused by the lack of correspondence between an L2 definition and the meaning that the definition is trying to convey" (p. 545). Moreover, empirical evidence supports the effectiveness of translation in promoting vocabulary retention and comprehension (Ellis & Beaton, 1993; Nation, 2013b, p. 22; Thornbury, 2019). Studies show that L1-L2 associations yield higher retention rates than L2 definitions (Lado et al., 1967; Laufer & Shmueli, 1997; Sawada, 2009), L2 explanations, or imagery-based techniques (Altarriba & Knickerbocker, 2011).

The use of translation in this phase also aligned with the moderate monolingualism principle typically guiding English instruction at the lower secondary level. Although degrees of monolingualism vary across learner populations, vocabulary acquisition is one domain where strict monolingual policies may be counterproductive. Psycholinguistic evidence supports this position; for instance, Kern (1994) demonstrated that mental translation occurs naturally when learners read in a foreign language. He defined it as the "conscious recourse to the mother tongue with which foreign language words, phrases or sentences are mentally rewritten in the mother tongue" (p. 101).

In summary, this structured, student-led presentation phase aimed to foster deep and durable MWU acquisition by integrating guided preparation, active participation, L1-mediated support, and theoretically grounded instructional strategies. It equipped learners not only to recognize but also to internalize and productively use MWUs in meaningful contexts.

3.3.1.3 Reproductive Phase

In the reproductive phase of the intervention, both the test and control groups completed two consecutive rounds of reading-while-listening activities designed to facilitate the incidental acquisition of MWUs. Participants in the test group were instructed to sing along with selected English pop songs that contained the target MWUs, whereas participants in the control group recited aloud a narrative version of the same lyrics presented in spoken, non-musical form. These two formats were designed to elicit incidental learning by embedding MWUs in auditory and visual input, without direct instruction or metalinguistic explanation, con-

sistent with the Default Learning Hypothesis (Jenkins & Dixon, 1983; Jenkins et al., 1984), which posits that vocabulary is primarily acquired through implicit exposure rather than explicit teaching.

Each reading-while-listening round lasted approximately 10-12 minutes and was administered via classroom speakers and printed handouts. All participants received identical printed lyrics or narrative texts, with the target MWUs highlighted. Teachers instructed both groups to focus on pronunciation and rhythm during the activity but avoided giving explicit vocabulary explanations. The implementation of this task was informed by prior empirical findings indicating that the combination of auditory and visual modalities enhances vocabulary processing (Brown et al., 2008; Horst et al., 1998; Lewis, 2000; Nation, 2013b; Webb & Chang, 2015a; Webb & Nation, 2017). Reading-while-listening has been shown to produce greater vocabulary gains than repeated reading alone, particularly when lexical items recur frequently within the input (Webb & Chang, 2012a; Webb et al., 2013).

In both conditions, the design of the input supported prosodic segmentation as a cognitive mechanism facilitating the acquisition of MWUs. Silent readers are known to impose prosodic boundaries during reading (Hwang & Schafer, 2009; Augurzky, 2006; Hirose, 2003), and this strategy may have aided processing even in the control group. The activity design was based on the Implicit Prosody Hypothesis (Fodor, 1998), which proposes that subvocalized prosodic patterns support syntactic and lexical processing during reading. This theoretical foundation was supported by studies indicating that MWUs are more easily acquired when they follow predictable rhythmic and prosodic structures (Rukholm et al., 2018; Bree et al., 2019, as cited in Sammler & Elmer, 2020, p. 103). Pop lyrics were selected in part for their repetitive and rhythmically structured phrasing, which served as a scaffold for prosodic parsing (Pavia et al., 2019; van Zeeland & Schmidt, 2013a).

In the test condition, the integration of melody and lyrics was intended not only to engage learners but also to function as a mnemonic device that supports the encoding of MWUs into long-term memory. Previous studies have emphasized the role of music in reinforcing recall and supporting productive language use (Brewster & Ellis, 2003; Lyczak, 1979; Maier, 1995; Quast, 1994). Beyond memory benefits, the group-based singing activity was designed to foster classroom cohesion, motivation, and emotional safety—factors shown to enhance

learning environments and social trust (Anshel & Kipper, 1988; Engh, 2013; Huy, 1999; Lake, 2003; Lems, 1996; McMillan & Chavis, 1986).

In addition to its social and emotional functions, vocal training was deliberately implemented to engage multiple sensory modalities. Participants in the test group were encouraged to incorporate rhythmic body movements such as clapping, tapping, or swaying while singing. These actions were modeled by the teacher and practiced during warm-ups to ensure consistency across groups. This design was grounded in theories of embodied cognition, which suggest that bodily experiences influence and support cognitive processing, including language acquisition (Barsalou, 1999; Glenberg & Robertson, 2000; Glenberg & Kaschak, 2002; Zwaan & Taylor, 2006). The pedagogical use of embodied, multimodal input was further justified by neuroscientific studies showing that sensorimotor-auditory training enhances memory formation, as indicated by increased mismatch negativity responses in electroencephalographic data (Lappe et al., 2008; Picton et al., 2000). Shurley (2002) similarly emphasized that integrating visual, auditory, and kinesthetic input supports retention and retrieval of language material.

The movement-based aspects of the singing task were also informed by procedural memory theory and emotional cognition. According to Jensen (1998), bodily movement activates brain structures involved in memory and emotional regulation—such as the cerebellum, basal ganglia, and frontal lobes—and may facilitate memory retrieval through sensorimotor pathways. Jensen also highlights that emotional memory is distributed throughout the body in peptide molecules, which respond to physical movement (p. 27). These neurophysiological processes were considered in the design to leverage memory encoding through active participation.

The inclusion of multisensory and embodied elements was further supported by multisensory learning theory. As McConchie and Jensen (2020) explain, engaging multiple sensory systems simultaneously—through movement, music, and visual stimuli—can stimulate dopamine release and increase oxygen flow to the brain, thereby supporting attention, emotional regulation, and long-term potentiation. These effects are mediated by brain-derived neurotrophic factor, which is essential for stable memory consolidation.

To ensure internal validity and control for extraneous variables, all reading-while-listening sessions were standardized in terms of duration, presentation format, and auditory characteristics. In both groups, the input was presented using classroom loudspeakers at a calibrated volume and tempo. The tempo of the audio

input was standardized to minimize any effects of pacing on cognitive load or memory. This methodological decision was informed by findings that tempo influences auditory memory and linguistic processing (Healey et al., 1976; Kilgour et al., 2000). Although earlier studies emphasized the benefits of slower tempos for memory retention (Healey et al., 1976), subsequent research has shown more complex outcomes: faster tempos may improve cognitive performance in some contexts (McElrea & Standing, 1992; Nittono et al., 2000), while excessively slow tempos may impair reading fluency and increase cognitive load (Kallinen, 2002). Kallinen also observed gender-related differences in response to tempo: women showed more positive affect under slow-tempo conditions, whereas men demonstrated improved content processing under similar auditory stimuli.

Additionally, auditory input timing was informed by the Multi-Time Resolution Hypothesis, which posits that fast and slow auditory information activate different neural pathways. Specifically, fast-paced stimuli are processed bilaterally, while slow-paced stimuli predominantly engage the right temporal cortex (Pöppel et al., 2008). Because tempo also affects emotional arousal—slow music tends to elicit low-arousal states such as sadness, while fast music induces heightened arousal (Van der Zwaag et al., 2011; Gagnon & Peretz, 2003; Husain et al., 2002; Schellenberg et al., 2000)—tempo and arousal level were carefully balanced in both conditions. These findings underscore the importance of standardizing auditory input to eliminate extraneous variability and isolate the effect of instructional modality on MWU learning.

3.3.1.4 Application Phase and Production Phase

The application and production phases were designed to facilitate the transfer of targeted MWUs into active use through structured bridging tasks. These tasks included a fill-in-the-gap exercise and a short writing assignment, both of which closely mirrored the format of the vocabulary test, differing only in the selection of MWUs.

In the fill-in-the-gap task, learners completed a short narrative unrelated to the song lyrics. The text contained five blanks, which students filled in using the appropriate MWUs provided in a word bank. Correct responses required contextually appropriate tense (present or past) and grammatical person. In the writing task, students composed a short text of at least 50 words, beginning with a provided sentence and incorporating all five target MWUs listed in the instruction box. These tasks served both pedagogical and evaluative functions, targeting the development of both receptive and productive MWU knowledge.

Both tasks were administered in written form—either digitally on iPads or on paper—as written procedures ensured full participation. As Haß et al. (2017) noted, "written procedures … involve all learners, which means that everyone must or should be prepared" (p. 103).

The activities were conducted in pairs to foster collaboration, peer scaffolding, and vocabulary learning through social interaction and negotiation. Collaborative engagement encouraged learners to solve problems and discuss the contextual use of MWUs, enhancing their linguistic awareness. Empirical evidence suggests that such peer interaction can enhance vocabulary retention, particularly when learners are prompted to engage in "pushed output," or language production that exceeds their current level (De la Fuente, 2002). Additionally, collaborative tasks supported peer assistance and repair sequences—processes that are integral to second language development (Foster & Ohta, 2005).

This instructional design was underpinned by Laufer and Hulstijn's (2001) Involvement Load Hypothesis, which identifies three cognitive dimensions that promote vocabulary acquisition: need (learners' motivation to use or understand a word), search (discovering a word's meaning), and evaluation (contextual comparison and usage). Newton (2013) argued that collaborative negotiation activates all three components: learners jointly identify unknown vocabulary, search for its meaning, and immediately evaluate its suitability in context through discussion and application. Such interaction-rich tasks are more conducive to incidental vocabulary acquisition than tasks lacking these elements (Newton, 2013, pp. 166–168).

Students were allocated five minutes for the fill-in-the-gap task and ten minutes for the writing task, with flexibility to adjust based on individual needs. Early finishers received an optional multiple-choice extension task (Appendix K), while those requiring additional support were given a *Helping Card* (Appendix K) with linking phrases and sentence prompts. All materials for this phase—including those used in Boxes 3 and 7 of the school-based intervention—are included in Appendix K.

The instructional design for these phases aligned with Nation's (2007) framework of the four strands of language learning, particularly in terms of meaning-focused output, language-focused learning, and fluency development. Meaning-focused output was supported through writing tasks that required learners to use MWUs productively and contextually. Language-focused learning emerged as students collaborated to overcome lexical and grammatical challenges, promoting metalinguistic awareness (Nation, 2007, p. 5; Simcock, 1993). Fluency development was addressed by encouraging the rapid and accurate application of known MWUs in new contexts. As Nation (2012) emphasized, "fluency development is an essential

and often neglected part of a language course" (p. 9), and vocabulary knowledge is of limited communicative value unless learners can access and use it fluently.

3.3.1.5 Consolidation Phase

The final learning phase was consolidation, described by McConchie and Jensen (2020) as the stage in which learning is "proofed" through corrective feedback and error analysis (p. 62). This phase played a crucial role in the overall instructional design and was widely acknowledged in the pedagogical literature as essential for effective language learning (Harmer, 2004, 2007; Lewis, 1997; Nunan, 1991; Parrot, 2000; Richards & Rodgers, 2001; Scrivener, 2011; Thornbury, 2005; Ur, 2012). During this phase, learners consolidated and reflected on the MWUs encountered in the application and production tasks through guided whole-class review and discussion.

Specifically, learners' responses from Task 1 (fill-in-the-gap) were reviewed and corrected collaboratively. The teacher projected the original story along with the correct MWUs, enabling a step-by-step plenary discussion. This collaborative correction process provided learners with immediate feedback and reinforced accurate MWU usage. Subsequently, one or two student-written stories from Task 2 (the productive writing task) were selected and projected for class-wide revision. These texts served as springboards for deeper discussions of linguistic choices, grammatical accuracy, and lexical appropriateness. A total of ten minutes was allocated for this phase.

The consolidation phase supported two of Nation's (2008) four strands of language learning: meaning-focused output and language-focused learning. Although the activities centered on student-generated content, the emphasis during this stage shifted toward deliberate attention to language form—specifically, the MWUs targeted during the intervention. This context-based focus on form allowed learners to analyze their own linguistic output and engage in metalinguistic reflection.

Interaction between teacher and learners was central to this phase. Through the collective examination of student work, learners were guided to reflect on the correctness, clarity, and appropriateness of their MWU use. This interactive dialogue promoted awareness of language form within meaningful communicative contexts. Swain and Lapkin (1998) emphasized that such language-related episodes, where learners are encouraged to notice and discuss gaps in their output, contribute significantly to L2 development by fostering refinement of interlanguage systems.

In summary, the consolidation phase integrated elements of communication, feedback, reflection, and instruction. It helped learners internalize the MWUs that had been introduced, practiced, and applied throughout the intervention by offering

a final opportunity for clarification, reinforcement, and correction within a collaborative learning environment.

3.4 Materials

This section outlines the development, structure, and pedagogical justification of the materials used in the intervention, with particular emphasis on their linguistic and musical alignment with the study's vocabulary learning objectives. It begins with a critical discussion of the role and limitations of existing corpora in research focused on vocabulary learning, particularly for younger L2 learners and MWU-focused instruction. Based on this review, the rationale for creating a purpose-specific corpus of 56 authentic English pop songs is presented, followed by a detailed account of the criteria and procedures used for song selection and analyses.

Subsequently, the section introduces the selected MWUs derived from the corpus, explaining how they were chosen based on frequency, contextual relevance, and curricular alignment. The process involved integrating corpus linguistics tools and CEFR-based proficiency benchmarks, as well as matching the lexical items to thematic categories outlined in NRW's (Germany) Grade 6 curricula. The final part of this section presents an overview of the instructional vocabulary drawn from contemporary EFL textbooks used in NRW, ensuring that the materials reflect both curricular requirements and learners' cognitive and linguistic developmental stages.

3.4.1 Corpus

A fundamental step in the design of any vocabulary-focused intervention is the development or selection of a corpus that closely aligns with the learners' developmental stage and the instructional objectives of the intervention. The present study required a corpus tailored not only to the linguistic needs of sixth-grade EFL learners but also to the methodological demands of a controlled school-based study focused on MWU acquisition. Table 8 provides an overview of the most frequently employed corpora in vocabulary research.

Table 8. *Corpora Frequently Employed in Vocabulary Assessment Research*

Corpus	Author	Year	Specifications
General Service List of English Words	West	1953	2,000 word families

Corpus	Author	Year	Specifications
British National Corpus	Oxford University Press	1980s 1990s	100 million words
Corpus of Contemporary American English (COCA)	Davies	2010	560+ million words
Academic Word List (AWL)	Coxhead	2000	570 word families
Giessen- Bonn Corpus of Popular Music (GBoP)	Kreyer & Mukherjee	2007	1000,000 words
COCA/BNC	Nation	2016	28 word family
Essential Word List	Dang & Webb	2016	176 function words

To inform the methodological design of a developmentally appropriate vocabulary corpus for this intervention, the present study systematically evaluated the limitations of widely used corpora such as the General Service List (GSL) and the British National Corpus (BNC). Although these corpora are foundational in vocabulary-focused research, they often fall short when applied to younger L2 learners and MWU instruction. As Nation (2004) and Richards (1969) emphasize, corpus design must reflect the linguistic, cognitive, and communicative characteristics of the target learner group. Standard corpora tend to represent formal, adult-oriented, and British English, which can appear abstract, outdated, or culturally irrelevant to younger learners (Satri Adnyani, 2020). For instance, Nation (2004) criticized the inclusion of terms such as "television," "computer," and "drugs" in the GSL and BNC, arguing that they no longer reflect the realities or needs of classroom learners. He cautioned that "if the British National Corpus lists were used as a basis for school curriculum design, there would be a mismatch between the nature and goals of the learners, and the nature of the corpus that the lists are drawn from" (p. 3).

Further empirical studies underscore the need for contextually relevant corpora. Nation (2006) found that the first 1,000 word families in the BNC covered 77.86% of the Lancaster-Oslo-Bergen (LOB) Corpus, with the second and third 1,000 word families adding 8.23% and 3.70%, respectively. These bands accounted for 85.11% of vocabulary in 88 television programs (Webb & Rodgers, 2009a) and

86.52% in 318 movies (Webb & Rodgers, 2009b). While these findings suggest that media-based input supports vocabulary acquisition, they also reveal a limitation: mainstream corpora like the BNC and LOB typically exclude pop music—a culturally and linguistically significant input source for young learners (Degrave, 2019; Tegge, 2018; Werner, 2018b).

To bridge this gap, a few music-oriented corpora have emerged. Murphey (1989, 1992) developed a 13,161-word corpus based on the top 50 songs from *Music and Media's Hot 100 Chart*, highlighting the predominance of first- and second-person pronouns, possessive determiners, and minimal reference to time, location, or gender. These features increase the accessibility of pop lyrics for beginning and intermediate learners. Similarly, the Giessen-Bonn Corpus of Popular Music (GBoP), compiled by Kreyer and Mukherjee (2007), provides English teachers with a pedagogically structured repository of song lyrics.

Despite these contributions, most existing corpora remain insufficiently tailored to the methodological demands and learner-centered requirements of experimental school-based research. Teachers and researchers frequently report difficulties identifying songs that are linguistically suitable, age-appropriate, and thematically aligned with curriculum objectives (Engh, 2013). Additionally, the time and effort required to locate appropriate music, as well as to design suitable teaching materials, often discourage the implementation of songs. Above all, the high costs associated with securing copyright permissions for lyrics present a significant to the implementation of songs in educational settings (Werner & Tegge, 2021, p. 139).

To address these limitations, the present study developed a custom corpus comprising 56 authentic English pop songs selected through a multi-criteria approach. The overarching goal was to ensure that the songs not only reflected learners' developmental needs and curricular themes but also supported the accurate assessment of MWU learning gains.

A primary concern in the selection process was ensuring internal validity. To minimize the risk of prior familiarity influencing learning outcomes, all chosen songs were released before 2011—corresponding to the average birth year of the sixth-grade pupils participating in the study (Werner, 2008; Nation & Webb, 2011). This ensured that any vocabulary gains could be attributed to the intervention rather than pre-existing exposure.

The linguistic evaluation of lyrics focused on identifying MWUs that were developmentally appropriate, contextually relevant, and pedagogically useful. As Tegge (2015) noted, teachers must consider the suitability of vocabulary within song lyrics. Learners must also perceive new vocabulary as relevant and meaningful to foster engagement and retention (White, 2000; Faber & Linares, 2001). Songs con-

taining content deemed inappropriate—such as references to sex, drugs, or violence—were excluded from the corpus (Aquil, 2012; Murphey, 1990a; Purcell, 1992; Richards, 1969; Smith Salcedo, 2002).

To ensure alignment with educational standards, all MWUs corresponded to the thematic units outlined in the 2022 NRW core curriculum for grade 6. Songs containing significant interference from other languages—such as Spanish lyrics in tracks by Shakira or Usher featuring Romeo Santos—were also excluded. The lexical complexity of the lyrics was evaluated using measures such as type-token ratio (TTR), word frequency, and syntactic complexity (Zipf, 1949; Scott, 2008). Analytical tools such as WordSmith Tools enabled a detailed assessment of sentence length, vocabulary repetition, and structural complexity, while attention was also paid to the variety of English spoken by the artist to ensure consistency with EFL teaching models.

Speech rate was another crucial factor in song selection. Songs with extreme pacing—either too fast or too slow—can negatively impact processing and comprehension (Goswami, 2015; Levitin, 2012; Mendelsohn et al., 2017; Montgomery, 2019; Slevc et al., 2009). To quantify this, each song's speech rate was measured in words per second (wps) and words per minute (wpm) (Kilgour et al., 2000; Besson et al., 2011).

Musical characteristics were also carefully considered to maximize learner engagement and mnemonic efficiency. Songs were selected within a tempo range of 70-150 beats per minute, consistent with findings linking moderate tempos to cognitive arousal and attention (Husain et al., 2002; Jäncke et al., 2015; Medina, 1993; Thompson et al., 2011). Rap songs and songs with overly fast tempos were excluded. Tonality played a similarly pivotal role; major keys were preferred for their association with positive emotional states (Gabrielsson & Lindström, 2010), while overly melancholic or complex tonalities were avoided.

Additional musical elements were evaluated to ensure accessibility. Songs in simple and intuitive time signatures- such as 4/4 and 3/4- were prioritized to reduce cognitive load (Patel & Daniele, 2003). Vocal range was assessed to ensure it aligned with adolescent voice capabilities, avoiding songs with extreme pitch intervals (Welch & Howard, 2001; Lundberg, 2010). Songs longer than three minutes were generally excluded to prevent cognitive fatigue, in line with research highlighting the benefits of concise lyrical content for memory retention (Levitin, 2012; Rainey & Larsen, 2002; Särkämö et al., 2014).

Instrumentation was another key factor. Songs featuring familiar and culturally resonant instruments—such as voice, piano, guitar, bass, and drums—were favored, given their demonstrated influence on emotional engagement and attention

(Huron, 2006; Gabrielsson & Lindström, 2010; Sloboda & Davidson, 1996). Finally, pop songs were evaluated based on structural predictability, with a preference for songs following a typical pop song structure (intro, verse, pre-chorus, chorus, bridge, outro), which supports linguistic segmentation and memory recall (Särkämö et al., 2014; Medina, 2003).

In order to ensure that the corpus reflected both pedagogical relevance and learner engagement, the selection of artists and songs followed a carefully considered approach. Artists were chosen based on rankings drawn from a diverse range of reputable sources, including *The Top Tens* lists of the 25 best pop singers and pop stars of all time, the most recent compilation by Dan Farrant, the "19 Greatest and Most Famous Pop Singers of All Time," Will Fenton's "25 Best Pop Singers & Artists of All Time (Most Famous)," and *The Famous People- Pop Singers*, which uses an algorithm aggregating user votes and online search trends. Additional input was drawn from Kan Nigua's ranking of the top 20 pop singers of the 21st century. These sources ensured that the final list of artists not only reflected widespread recognition but also maintained cultural resonance among the target learner demographic.

The final corpus comprised 56 authentic English pop songs. These songs were catalogued in Table 9 alphabetically by artist and, where multiple entries from the same artist occurred, further sorted chronologically by year of release.

Table 9. *Corpus of Authentic Pop Songs: Artists and Release Years (N=56)*

Artist(s)	**Song title**	**Publication year**
3 Doors Down	***Here Without You***	2003
Alicia Keys	***If I Ain't Got You***	2004
Anastacia	***One Day in Your Life***	2001
Beyoncé	***Sweet Dreams***	2008
Beyoncé	***Beautiful Liar***	2007
Bruno Mars	***Just the Way You are***	2010
Bruno Mars	***Count on Me***	2010
Cascada	***Dangerous***	2009

Artist(s)	**Song title**	**Publication year**
Cascada	***Au Revoir***	2011
Celin Dion	***I'm Alive***	2002
Chris Brown	***Forever***	2008
Christina Aguilera	***Ain't no Other Man***	2006
Coldplay	***Viva la Vida***	2008
Demi Lovato	***This is Me***	2008
Ellie Goulding	***Lights***	2011
Flo Rida	***Right Round***	2009
Ashley Tisdale & Lucas Grabeel	***What I've Been Looking for***	2006
Zac Efron, Gabriella Montez, Ashley Tisdale, Lucas Grabeel, Corbin Bleu, Monique Coleman	***What Time is It?***	2007
Ashley Tisdale & Lucas Grabeel	***I want It All***	2008
Zac Efron, Gabriella Montez, Ashley Tisdale, Lucas Grabeel, Corbin Bleu, Monique Coleman	***We're All in This Together***	2008
Zac Efron, Gabriella Montez, Ashley Tisdale, Lucas Grabeel, Corbin Bleu, Monique Coleman	***High School Musical***	2008
James Morrison	***You Give Me Something***	2006
James Morrison	***I won't Let You Go***	2011
James Morrison	***Broken Strings***	2008
Jason Mraz	***I'm Yours***	2008
Jessie Jay	***Domino***	2011

Artist(s)	**Song title**	**Publica-tion year**
Jessie Jay	***Price Tag***	2011
Justin Bieber	***Baby***	2010
Katy Perry	***Hot N Cold***	2008
Katy Perry	***Teenage Dream***	2010
Katy Perry	***California girls***	2010
Kesha	***Tik Tok***	2009
Madonna	***Hung Up***	2005
Mario	***Let me love you***	2004
Maroon 5	***This Love***	2004
Maroon 5	***Sunday Morning***	2004
Maroon 5	***Must Get Out***	2005
Maroon 5	***Won't Go Home Without You***	2007
Maroon 5	***Misery***	2010
Michael Bublé	***Everything***	2007
Michael Bublé	***Haven't Met you yet***	2009
Miley Cyrus	***You'll Always Find Your Way Back Home***	2009
Miley Cyrus	***Let's Get Crazy***	2009
Miley Cyrus	***Rockstar***	2009
Ne- Yo	***So Sick***	2006
Ne- Yo	***Miss Independent***	2008
Ne- Yo	***Closer***	2008

Artist(s)	Song title	Publication year
Ne- Yo	***One in A Million***	2010
One Direction	***What Makes You Beautiful***	2011
One Republic	***Good Life***	2009
Robbie William	***Feel***	2002
The Black Eyed Peas	***Shut Up***	2003
The Black Eyed Peas	***Where is the Love?***	2003
The Black Eyed Peas	***I Gotta Feeling***	2009
The Last Goodnight	***Pictures of You***	2007
Usher	***Without You***	2007

To facilitate linguistic analysis, the lyrics of all 56 songs were initially retrieved from songlyrics.com and verified for accuracy through comparison with songtexte.com. A multi-layered lexical analysis was then conducted to provide a comprehensive linguistic profile. The RANGE program (Heatley et al., 2002) was used to determine the number of tokens and lexical types per song, offering a foundational measure of lexical density. This was supplemented by WordSmith Tools, Version 5 (Scott, 2008), which calculated the standardized type-token ratio (STTR). Manual recalculations were performed to confirm consistency and ensure data integrity.

To further categorize lexical coverage, AntWordProfiler (Anthony, 2014) was employed to identify headword frequencies and classify lexical items into established frequency bands. Specifically, the corpus was segmented into the following categories:

- 1_gsl_1st_1000: The first 1,000 most frequently used words from the GSL, considered essential for everyday communication in English.
- 2_gsl_2nd_1000: The second 1,000 most frequent words, including high-utility items such as *love*, *time*, and *work*.

- 3_awl_570: The Academic Word List, comprising 570 word families commonly encountered in academic texts, including terms such as *analyze*, *evaluate*, and *hypothesis*.

During the preprocessing phase, several standardization procedures were implemented to ensure lexical comparability. Non-lexical vocables such as "ay," "oh," and "hm" were removed due to their limited semantic contribution and primarily rhythmic or melodic function (Chambers, 1980; Werner, 2012). Spelling variants and colloquial contractions (e.g., *wishin*, *nothin*, *mma/ma*) were normalized to their standard forms (e.g., *wish*, *nothing*, *go*). Morphological derivatives (e.g., *campaigns*, *geekin*) and common contractions (e.g., *coulda*, *shoulda*) were mapped to their root forms. Additional lexical elements not present in standard lists—such as marginal expressions (e.g., *ouches*, *nuhuh*), abbreviations (e.g., *YOLO*, *VHS*), and proper nouns (e.g., *Gucci*, *Cardi*)—were also manually integrated.

Semantic phenomena such as extension and inversion were noted and addressed to capture their impact on learner interpretation. In line with pedagogical priorities, preference was given to lyrics dominated by high-frequency words, thus reducing the cognitive burden associated with rare or overly complex vocabulary. Words forming part of the target MWUs were cross-verified using the Oxford Learner's Dictionaries (https://www.oxfordlearnersdictionaries.com) to ensure they primarily aligned with the A2 proficiency level, with a small proportion at the B1 level. The outcomes of this lexical analysis are documented in Table A1 (Appendix A), while musical features—including song duration, tempo, key, time signature, vocal range, speech rate, mean speed, instrumentation, and structural layout—are summarized in Table B1 (Appendix B).

Building upon the detailed lexical and musical analyses, a macro-level statistical summary was conducted to quantify the linguistic and musical characteristics of the compiled corpus. This analysis offers insight into the overall structure, frequency patterns, and pedagogical suitability of the 56 pop songs selected for this study.

From a linguistic standpoint, the corpus was examined using a combination of established corpus analysis tools. The RANGE program (Heatley et al., 2002) and AntWordProfiler (Anthony, 2014) revealed that the full corpus comprises 22,910 tokens, 1,779 lexical types, and 1,380 headwords. Supplementary analysis with WordSmith Tools, Version 5 (Scott, 2008), produced a standardized type-token ratio of 25.75, indicating a moderate degree of lexical diversity across the dataset. The total number of running words in the corpus is 21,134, comprising 105,731 characters

(including spaces) and 85,128 characters (excluding spaces). Detailed lexical frequencies and headword distributions are presented in Table C1 (Appendix C).

In terms of lexical coverage, the vocabulary of the corpus was further categorized by frequency bands using AntWordProfiler, based on established lists:

- 1_GSL_1st_1000: The first 1,000 most frequently used words from the GSL, accounting for 86.60% of the corpus.
- 2_GSL_2nd_1000: The second 1,000 most frequently used words, comprising 4.90%.
- 3_AWL_570: Academic vocabulary from Coxhead's Academic Word List, making up 0.40%.
- Not in Lists: Words not covered by the aforementioned lists, constituting 8.20% of the corpus.

The full categorization of lexical items across these frequency bands is available in Table D1 (Appendix D). To complement the lexical analysis, the 1,779 types and 1,380 headwords were further grouped by part of speech, providing grammatical insights into the composition of the corpus. These classifications are summarized in Table E1 (Appendix E). In addition, Table F1 (Appendix F) presents a breakdown of the artists' countries of origin, offering further insight into the regional distribution of English varieties represented in the songs.

From a musical perspective, several key metrics were analyzed to evaluate the pedagogical suitability of the songs. The average song duration is 3 minutes and 38 seconds, with a standard deviation of approximately 40 seconds. The longest track, *Shut Up* by Black Eyed Peas, runs for 4:56, while the shortest, *What I've Been Looking For* from *High School Musical*, lasts 2:00. The mode duration of 41.69 seconds reflects common structural conventions in contemporary pop music.

Tempo values across the corpus range from 73.0 beats per minute (BPM) (*Here Without You*) to 153.8 BPM (*You 'll Always Find Your Way Back Home*), with an average tempo of 115.57 BPM and a standard deviation of 6.34 BPM. The most frequently occurring tempo is 120.2 BPM, aligning with commercial pop norms.

Tonality analysis revealed that the average key is F#, while B major was the most frequently occurring key, found in seven songs (e.g., *Lights*, *I Want It All*, *Teenage Dream*, *I 'm Yours*, *Let 's Get Crazy*). The standard deviation of 1.87 suggests a broad tonal spectrum, although major keys predominate (33 songs) over minor keys (23 songs), consistent with the generally upbeat tone of pop music.

The majority of songs employ a 4/4 time signature, although some tracks introduce rhythmic variation, including 3/4 (*If I Ain't Got You*), 12/8 (*Have Not Met You Yet*), and 2/4 (*Rockstar*). Regarding vocal range, the highest span observed—F#3 to G#5—appears in *Ain't No Other Man* and *Domino*. The lowest vocal point (E3) is featured in *If I Ain't Got You* and *Viva la Vida*. On average, songs span 1.49 octaves, with a standard deviation of 0.83, indicating moderate variability. The most frequently occurring vocal range, A3-D5, appears in four songs (*If I Ain't Got You*, *One Day in Your Life*, *Dangerous*, *Must Get Out*).

Analysis of speech rate across the corpus reveals substantial variation, ranging from 0.92 words per second (wps) (*Just the Way You Are*) to 3.70 wps (*Count on Me*). Mean speed, measured in words per minute (wpm), spans from 53.48 wpm (*Feel*) to 304.77 wpm (*Right Round*). These metrics provide valuable insight into the cognitive demands posed by different songs, especially in terms of processing time and lexical density. Notably, the mean speed of pop lyrics tends to be approximately half that of regular speech, due to the frequent rhythmic pauses embedded in lyrical structure.

These pauses serve more than a musical function; they foster listener engagement, allowing for semantic reflection, and promoting active meaning-making. Songs that combine rapid articulation with longer pauses present an interesting duality—where speech rate is high, but mean speed remains low—reflecting typical pop stylings that balance energy with processability.

In terms of instrumentation, the corpus reflects a consistent yet diverse musical profile. The average number of instruments per song is 4.8, with a standard deviation of 1.4. All songs include voice as the primary instrument. Guitars and piano/keyboards appear in 48 of 55 songs, while drums and bass feature in 54 tracks, highlighting their foundational role in pop arrangements. Additional textures are added by synthesizers (31 songs) and strings (20 songs), while turntable/scratching effects were used only once (*Shut Up*), marking it as the least common instrument.

Finally, analysis of song structure confirms that the majority of tracks conform to a conventional pop format: intro, verse 1, pre-chorus, chorus, verse 2, pre-chorus, chorus, bridge, chorus, outro. This structure aids in emotional build-up, narrative development, and memory retention through repetition and predictability. Minor deviations were observed: *Viva la Vida* includes an extended instrumental section following the bridge, *This Is Me* incorporates a climax section, *Here Without You*, *Beautiful Liar*, and *Count on Me* omit the pre-chorus. Such variations offer valuable diversity within a generally stable template, enriching the corpus and supporting multiple learning pathways.

3.4.2 Multi-Word Units

The selection of MWUs for the intervention was guided by two main criteria: lexical frequency and contextual relevance. These criteria ensured that the instructional input was pedagogically suitable for sixth-grade learners, aligned with CEFR benchmarks, and reflected both classroom and real-world language exposure.

To operationalize frequency-based selection, lexical items were extracted from the custom pop song corpus (see Section 3.4.1) and analyzed using RANGE (Nation, 2004, 2006). MWUs within the 2,000 to 3,000 most frequent word families were prioritized, as this range is widely recognized as foundational for beginner- to intermediate-level L2 learners (Webb & Nation, 2017; West, 1953; Sinclair, 1991). Frequency classifications were further informed by Nation's (2001) four-way model—distinguishing high-frequency, academic, technical, and low-frequency words—and supported by the lexical distribution described in Zipf's law, which states that a small number of high-frequency items dominate natural language input (Piantadosi, 2014).

To avoid prematurely introducing advanced or specialized vocabulary, the selected MWUs reflected the frequency profiles typically found in beginner-level graded readers (Webb & Nation, 2017) and were also cross-checked against Dang's (2020) guidelines for L2-appropriate vocabulary banding. For further granularity, items were filtered to exclude overly technical or context-dependent expressions that might hinder comprehension or distract from instructional objectives. This filtering strategy addressed the challenges associated with the "middle tier" of lexical frequency, which becomes more diffuse beyond the 3,000-word threshold and poses instructional difficulties for learners and educators (Boers & Lindstromberg, 2009).

In addition to frequency-based filtering, corpus analysis was supported by AntConc (Anthony, 2018), which enabled the extraction of frequent N-grams and formulaic expressions from the lyrics. To further refine the vocabulary pool, semantic filtering was conducted using ConceptNet to ensure that the selected expressions were cognitively and thematically appropriate for young learners. MWUs that occurred across three or more songs were prioritized to maximize repetition-based learning and reinforce contextual salience (Barlow, 2011).

To ensure age- and proficiency-level alignment, all MWUs were cross-referenced with the Oxford Learner's Word List and the English Vocabulary Profile Online. This process confirmed the CEFR level of each MWU, with only expressions classified as A2 or early B1 retained. The CEFR framework—dividing learner proficiency into six reference levels from A1 to C2—provided a transparent basis for

matching vocabulary input with learners' receptive and productive capacities. The global CEFR scale is summarized in Table 10.

Table 10. *CEFR Global Scale: Common Reference Levels for Language Proficiency*

Proficient User	**C2**	Can understand with ease virtually everything heard or read. Can summarize information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. Can express himself/herself spontaneously, very fluently, and precisely, differentiating finer shades of meaning even in more complex situations.
Proficient User	**C1**	Can understand a wide range of demanding, longer texts, and recognize implicit meaning. Can express himself/herself fluently and spontaneously without much obvious searching for expressions. Can use language flexibly and effectively for social, academic, and professional purposes. Can produce clear, well-structured, detailed text on complex subjects, showing controlled use of organizational patterns, connectors, and cohesive devices.
Independent User	**B2**	Can understand the main ideas of complex texts on both concrete and abstract topics, including technical discussions in his/her field of specialization. Can interact with a degree of fluency and spontaneity that makes regular interaction with native speakers quite possible without strain for either party. Can produce clear, detailed text on a wide range of subjects and explain a viewpoint on a topical issue, giving the advantages and disadvantages of various options.
Independent User	**B1**	Can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc. Can deal with most situations likely to arise while traveling in an area where the language is spoken. Can produce simple connected text on topics that are familiar or of personal interest. Can describe experiences and events, dreams, hopes, and ambitions, and briefly give reasons and explanations for opinions and plans.

Proficient User	**C2**	Can understand with ease virtually everything heard or read. Can summarize information from different spoken and written sources, reconstructing arguments and accounts in a coherent presentation. Can express himself/herself spontaneously, very fluently, and precisely, differentiating finer shades of meaning even in more complex situations.
Basic user	**A2**	Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g., very basic personal and family information, shopping, local geography, employment). Can communicate in simple and routine tasks requiring a direct exchange of information on familiar and routine matters. Can describe in simple terms aspects of his/her background, immediate environment, and matters in areas of immediate need.
Basic user	**A1**	Can understand and use familiar everyday expressions and very basic phrases aimed at satisfying needs of a concrete type. Can introduce himself/herself and others, and can ask and answer questions about personal details such as where he/she lives, people he/she knows, and things he/she has. Can interact in a simple way, provided the other person talks slowly and clearly and is prepared to help.

Source: Council of Europe (2001). Common Reference Levels: Global Scale. Retrieved from https://www.coe.int/en/web/common-european-framework-reference-languages/table-1-cefr-3.3-common-reference-levels-global-scale.

By restricting selection to MWUs at A2 and early B1 level, the intervention aligned with learners' language development stage and communicative goals. Reference to CEFR "can-do" descriptors ensured that MWUs targeted functions relevant to real-life tasks and classroom instruction (Council of Europe, 2017; Surkamp & Viebrock, 2018, pp. 22–23).

Finally, the pedagogical relevance of the selected MWUs was assessed according to classroom-focused criteria proposed by Brewster and Ellis (2003) and White (2000), including communicative utility, contextual transparency, and opportunities for oral and written application. This multi-step filtering and validation process ensured that the vocabulary presented to learners was not only frequent and

level-appropriate but also engaging, practical, and suitable for integration into classroom tasks.

Relevance formed the second pillar of MWUs selection. The MWUs taught had to be contextually meaningful, thematically appropriate, and of practical use to learners (Nattinger, 1980; Thornbury, 2019). The aim was to select expressions that resonated with learners' lives, interests, and communicative needs (Brewster & Ellis, 2003; Vinzentius, 2007).

In Germany, educational standards are grounded in curricula (*Lehrpläne*) and guidelines (*Richtlinien*) that define learning objectives by school type and grade level. In NRW, the curricula for *Gymnasium* and *Gesamtschule* emphasize competency-based education rather than prescriptive thematic vocabulary lists. This shift, introduced by the Standing Conference of Ministers of Education and Cultural Affairs (*Kultusministerkonferenz*) in 2003, established national educational standards focusing on outcome-based learning at key milestones (grades 4, 9, 10, and 12/13). These standards align with the CEFR and provide a framework for regional and national performance comparisons. By the end of grade 6, students are expected to reach at least A2 level proficiency.

To meet these requirements, the selected MWUs were aligned with the vocabulary demands of the 2019 *Gymnasium* and 2022 *Gesamtschule* curricula in NRW. The targeted vocabulary covered four thematic categories central to the sixth-grade curriculum:

- **Personal life**: family, friends, hobbies, school, sports, travel, nutrition, media use.
- **Education/school**: daily school life in Great Britain.
- **Participation in social life**: cultural, geographic, and social realities of children in a British context; significant figures, events, and media use.
- **Job orientation**: professions and related vocabulary, such as pocket money (p. 19).

The examined textbooks for 6th grade in NRW—*Red Line 2*, *Lighthouse 2*, *Blue Line 2*, *Access 2*, *Green Line 2*, *Camden Town 2*, *Nothing Hill Gate 2*—are comprehensive, typically consisting of five thematic units plus one historical unit, generally positioned at the end of the book. After analyzing several textbooks, the summary table below provides a thorough overview of these six units, detailing their titles, main focuses, subtopics, grammatical themes, and the number of MWUs introduced (compared to Phase 6[4]).

[4] Phase 6: https://www.phase-6.de/classic/service/user/teacher/education.html?tmp=0.7535491200527505

Table 11. *Analysis of Sixth-Grade EFL Textbook Units in NRW: Thematic Focus, Grammar, and Lexical Content*

Unit	Typical unit theme	Main focus	Subtopics	Grammatical topics	Number of MWUs
1	Together again	Grammar	• Holidays • Weekend • Activities • School • Birthday	Past simple	Approx. 125
2	Neighbours	Vocabulary	• Birthday • Shopping list • Summer • Holidays • Britain • Pet	Some and any (past simple)	Approx. 110
3	Teen talk	Grammar	• Hobbies • Activities • Arrange-ments • Future plans	Going to (fu-ture), compar-ative	Approx. 115
4	Feeling good	Vocabulary	• Food • Illnesses • School • Descrip-tions of	Many, much, a lot of, lots of	Approx. 115

Unit	Typical unit theme	Main focus	Subtopics	Grammatical topics	Number of MWUs
			people and things		
5	Dartmoor adventures	Vocabulary	• Trip to the country • Weather forecast • Future holidays	Review past simple and going to future	Approx. 140
6	A journey in time	History	The Pilgrims	Review past simple and going to future	Approx. 60

Note. *Themes and progression synthesized from analysis of major sixth-grade English textbooks used in NRW. Individual textbooks may vary in specific unit titles.*

The MWUs extracted from the song corpus were matched to these units and categorized by lexical frequency, CEFR level, associated topics, and subtopics. These are presented in Table G1 (Appendix G).

3.5 Instruments

To investigate the research questions guiding this study, three principal instruments were developed and systematically implemented: a pre-intervention questionnaire, a post-intervention questionnaire, and a vocabulary test specifically designed to assess productive and receptive MWUs knowledge. Each instrument was constructed based on established standards in educational and applied linguistics research and adapted to meet the specific needs of secondary school pupils.

The development of the pre- and post-intervention questionnaires was informed by established guidelines in empirical educational research and survey methodology. Drawing on the work of Caspari et al. (2016), Daase et al. (2014), Dörnyei (2007, 2010), Mayer (2013), and Porst (2014), the questionnaires were structured to ensure both methodological soundness and accessibility for the student participants. Specifically, following Caspari et al.'s (2016) recommendation, the items were log-

ically grouped into thematic blocks to facilitate cognitive coherence and to reduce the risk of response fatigue. As they advise, "In general, the recommendation is that items should be organized logically in topic blocks" (p. 161, translated by the author). The questionnaire was designed to be completed in 25 minutes, with an additional 5 minutes allocated for review—an approach supported by Dörnyei (2010, p. 13), who emphasizes the importance of offering respondents sufficient time to answer the questionnaire while avoiding cognitive overload.

To ensure data quality and promote honest, reflective responses, students were assured of their pseudonymity throughout the entire intervention. Each participant entered an assigned code instead of their name, in alignment with ethical standards regarding anonymity and data protection. The questionnaire instructions explicitly stated that there were no right or wrong answers and encouraged thoughtful, sincere responses, following the recommendations of Dörnyei (2010) and Porst (2014).

Demographic and contextual items were adapted from large-scale educational surveys known for their psychometric robustness, including VERA (2022), PISA (2022), IGLU (2021), and TIMSS (2019). These served as models for designing items that capture relevant background information in a clear and structured manner.

To maximize comprehension and response accuracy, the questionnaires were administered in German, the first language of the majority of the students. This decision was made to avoid introducing additional linguistic barriers that might have compromised the validity of the responses. Administering the instruments in English would have imposed an unnecessary cognitive load, thereby threatening the reliability of the data collected.

The complete versions of both the pre-intervention and post-intervention questionnaires are provided in Appendix K.

The vocabulary test was developed to address an identified gap in current assessment tools- namely, the limited ability of existing tests to measure the contextualized depth of MWU knowledge across the dimensions of form, meaning, and use (Nation, 2013a). To this end, the test included both cloze (gap-filling) and short writing tasks, enabling an integrated assessment of students' lexical competence. The test design was informed by vocabulary assessment theory (Brown, 2004; Read, 2000; Nation, 2001; Schmitt, 2010) and carefully aligned with the CEFR A2 level, curricular requirements of the NRW Ministry of Education, and principles of Cognitive Load Theory (Plass et al., 2012). A detailed scoring rubric was developed and standardized across test versions to ensure fairness, transparency, and interrater reliability.

All three instruments underwent a rigorous triangulation-based validation process (Caspari et al., 2016), involving expert review, teacher collaboration, and feed-

back from pupils who took part to the first study. Revisions made in response to this validation are documented in section 3.6. The following subsections describe the structure, purpose, implementation, and limitations of each instrument in detail.

3.5.1 Pre-Intervention Questionnaire

The pre-intervention questionnaire, carefully standardized for both the test and control groups, serves as a comprehensive instrument for data collection on the study's main variables. It consists of 23 items, utilizing both Likert-scale and multiple-choice formats. The questionnaire is divided into four thematic sections, each corresponding to one of the five core variables of the study: gender, L1/bilingualism, exposure to pop songs, exposure to English, and musical training.

Questions 1 and 2 collect demographic data, specifically gender (male, female, other) and age. Gender is a key variable in this study due to its influence on cognitive and linguistic processing (Herrmann & Fiebach, 2007; Miranda & Ullman, 2007; TIMSS & PIRLS, 2007; Schmenk, 2002; Ullman, 2001). While age is not a primary variable, it is recorded to account for differences due to grade repetition or early advancement and may be analyzed at a later stage for potential effects.

Questions 3 and 4 address L1(s) and bilingualism. Pupils are asked to identify their mother tongue(s) and any additional languages spoken at home (Bialystok, 2001; Cummins, 2008; Ellis, 2008; Rumlich, 2016; Schecter & Bayley, 2002).

Questions 5 to 8 focus on learners' exposure to English, measured using a five-point frequency scale ranging from "never" to "daily." These items assess how often students interact with English-speaking individuals, read English texts, watch English-language media, and engage with digital content in English (Baker, 2011; Fishman, 1972; Gudykunst, 2005; Oksaar, 2018; Oxford, 1990; Thorne & Black, 2011; Warschauer & Grimes, 2007).

Questions 9 to 13 assess intercultural and experiential exposure. Pupils indicate whether they have visited English-speaking countries, specifying the duration of their stay and the extent to which they used English during their visits (Baker & Prys Jones, 1998; Byram, 1997; Krashen, 1981).

Questions 14 and 15 inquire about the frequency with which learners listen to English-language music and pop songs (Besson et al., 2011; Hargreaves & North, 2010; Macmillan, 2013; Nation, 2001; Oxford, 1990; Patel, 2014). Question 16 gauges learners' self-reported understanding of English song lyrics, while question 17 explores their musical preferences (DeNora, 2000; Summer, 2010).

Question 18 evaluates students' beliefs about the cognitive benefits of musical training, such as improvements in memory and attention. This question is repeated

in the post-intervention questionnaire to measure any perceptual changes following the study (Bangert & Altenmüller, 2003; Benz et al., 2016; Bhide et al., 2013; Chan et al., 1998; Dittinger et al., 2016; Dörnyei & Ushioda, 2011; François et al., 2013; Hallam, 2010; Lightbown & Spada, 2013; Macmillan, 2013; Nation, 2001; Peretz & Zatorre, 2005; Schön et al., 2004, 2008; Schön & François, 2011; Summer, 2010; Thompson et al., 2004).

Section 4 of the questionnaire is dedicated to musical training and comprises questions 19 through 23. Question 19 gathers information on prior musical training, including private lessons, attendance at music schools, and the total duration of formal instruction (Amunts et al., 1997; Bangert et al., 2006; Besson & Faita, 1995; Gaser & Schlaug, 2003; Schlaug et al., 1995a; Schön et al., 2004). Question 20 assesses participation in musical events such as concerts, operas, and ballet performances—whether attended independently or with parents (Amunts et al., 1997; Bangert et al., 2006; Besson & Faita, 1995; Gaser & Schlaug, 2003; Schlaug et al., 1995a; Schön et al., 2004). Question 21 investigates which instruments students play and how often, using a scale ranging from "1-2 times a year" to "daily for an hour" (Gaser & Schlaug, 2003; Jentschke, 2018; Magne et al., 2006). Question 22 asks about the age at which students began formal music lessons (Altenmüller & Schlaug, 2015; Chan et al., 1998; Ho et al., 2003; Jentschke, 2018; Moreno et al., 2001; Sommer, 2016). Finally, question 23 checks whether learners have any hearing impairments, which may influence their auditory processing of music and language.

3.5.2 Post-Intervention Questionnaire

The post-intervention questionnaire was designed in two parallel versions: one for the test group and one for the control group. Both instruments employed a Likert scale with multiple-choice response options, allowing pupils to express their level of agreement or disagreement on a scale ranging from "never" to "always." The two versions shared a similar structure but were tailored slightly to reflect the differing instructional conditions of each group.

The first section of the questionnaire focused on students' well-being during the two-week intervention period. Drawing on a wide body of research that highlights the affective benefits of music and positive classroom atmospheres (Baur, 1990; Claerr & Gargan, 1984; Coe, 1972; De Groot, 2006; Dolean, 2016; Dolean & Dolean, 2014; Horwitz et al., 1986; Kanel, 1997; Krashen, 1985a; Lappe et al., 2008; Lozanov, 1978; MacLachlan, 2009; Marques et al., 2007; Meier, 2019; Merriam, 1964; Meyer, 1956; Arndt & Sambanis, 2017; Stoudenmire, 1975; Thiessen & Saffran, 2009; Wilcox, 1995), this section addressed research question 2 (RQ2), which

investigated the impact of authentic English pop songs on students' well-being. Items included statements such as "I felt comfortable and relaxed during the last two weeks of English lessons," "I concentrated more in English lessons over the past two weeks," and "I enjoyed singing English pop songs in class" (test group) or "I enjoyed reciting English song lyrics as storytelling" (control group). Another item compared the perceived difficulty of the intervention lessons to earlier ones, with test group pupils responding to "The English lessons with pop songs were easier for me than the previous ones," and control group pupils to "The English lessons with song lyrics were easier for me than previous lessons."

The second section contained a dedicated item (question 5) designed to investigate the occurrence of INMI. This question, grounded in the extensive literature on cognitive processing and memory in music-based contexts (Baddeley & Hitch, 1974; Barber, 1980; Calvert & Tart, 1993; de Guerrero, 1987; Krashen, 1983; Ludke & Good, 2020; Mary, 2022; McQuilla & Rodrigo, 1995; Murphey, 1989, 1990a, 1992; Nambiar, 1993; Parr & Krashen, 1986; Peretz & Zatorre, 2005; Rainey & Larsen, 2002; Salcedo, 2002; Salcedo & Harrison, 2002; Tomczak & Lew, 2019), was directly tied to research question 3 (RQ3) concerning the occurrence of INMI as a potential learning aid. Pupils in the test group were asked: "I had one or more English pop songs stuck in my head during the last two weeks. If yes, which songs?" The control group received a comparable item adapted to their approach: "I had one or more English lyrics stuck in my head during the last two weeks. If yes, which lyrics?" This adjustment ensured comparability between groups while accounting for the absence of music in the control condition.

The third section addressed students' perceptions of approach effectiveness. Questions 6 to 8 explored the self-assessed vocabulary learning efficacy, asking to what extent they felt the approach helped them learn English vocabulary. Following this, questions 9 to 11 gauged students' willingness to continue learning through the same approach in future English lessons, assessing the sustainability and perceived value of the approach. Question 4, embedded earlier in the questionnaire, asked students whether they enjoyed the materials which were used: "I liked the pop songs that were used in English lessons over the past two weeks" (test group) or "I liked the lyrics that were used in English lessons over the past two weeks" (control group).

Finally, question 12—administered only to the test group—revisited a statement from the pre-intervention questionnaire to examine shifts in perception regarding the benefits of musical training. The item read: "I believe that music lessons outside school (e.g., private lessons, music school) positively influence other areas of my life, such as learning, concentration, or relaxation." This question drew on extensive findings from the fields of music cognition and educational psychology, which

demonstrate that musical training can enhance executive functioning, memory, and emotional regulation (Bangert & Altenmüller, 2003; Benz et al., 2016; Bhide et al., 2013; Chan et al., 1998; Dittinger et al., 2016; Dörnyei & Ushioda, 2011; François et al., 2013; Hallam, 2010; Lightbown & Spada, 2013; Macmillan, 2013; Nation, 2001; Peretz & Zatorre, 2005; Schön et al., 2004, 2008; Schön & François, 2011; Summer, 2010; Thompson et al., 2004). Comparing pre-and post-intervention responses to this item offered additional insight into the broader impact of music- based approach on learners' attitudes and beliefs.

Taken together, the post-intervention questionnaire provided a comprehensive, differentiated evaluation of students' well-being, INMI, perceptions of instructional effectiveness, and evolving beliefs about music's role in learning (test group). Its dual design ensured comparability between test and control groups while allowing for the targeted investigation of variables central to the study's research questions.

3.5.3 Vocabulary Test

Since the choice of assessment tools significantly influences research outcomes (Waring, 2002), and no single test format perfectly aligns with all dimensions of MWUs knowledge, it is crucial to consider alternative methods that offer a valid and comprehensive evaluation of learners' vocabulary knowledge (Brown, 2004, p. 248). This study, therefore, introduces a custom-designed vocabulary test specifically developed to address gaps in current assessments, particularly regarding the evaluation of MWUs. Existing tests often fail to capture the depth of MWU knowledge across the three essential dimensions of vocabulary knowledge—form, meaning, and use. The integrative test employed in this study seeks to overcome this limitation by incorporating both receptive and productive tasks, including recall and recognition components, and a bilingual (German-English) translation.

The following analysis began with a review of commonly used vocabulary tasks in EFL pedagogy and empirical studies, focusing on their respective strengths and weaknesses. A comprehensive summary of this analysis is presented in Table J1 (Appendix J), which informed the selection of tasks for the intervention. Nine tasks were shortlisted based on their pedagogical relevance and feasibility:

- **Ordering tasks** test word form but offer limited contextual integration.
- **Gap-filling tasks** were selected in a modified form to assess contextual usage.
- **Describing/naming pictures**, though initially decontextualized, can be adapted by embedding images into narratives.

- **Contextualized multiple-choice** tasks were excluded due to feasibility concerns and limited form assessment.
- **Translation tasks** were acknowledged for supporting comprehension during instruction but excluded as primary test items.
- **Writing tasks** were selected for inclusion due to their capacity to assess productive lexical use.
- **C-tests** were excluded owing to their fixed contextual constraints.
- **Paraphrase recognition**, while valuable, was deemed too cognitively demanding for learners at the A2 level.
- **Oral interviews** were not considered, as this study focuses on written rather than oral production.

Based on these considerations, the test employed two tasks: a cloze (fill-in-the-gap) task and a written story composition. The cloze task includes five target MWUs and was chosen for its ability to assess contextual recall and grammatical adaptation. It aligns with common practice in language assessment, where 20-30% of the total vocabulary load is typically tested. Each MWU is embedded in a sentence requiring students to adapt its form (e.g., tense, number), allowing for the assessment of vocabulary knowledge across three dimensions—form, meaning, and use—according to Nation's (2013a) competence model. This includes sub-components such as written form, word parts, meaning associations, grammatical function, and collocations.

The second component is a writing task requiring the composition of a short text (minimum 50 words) that incorporates a set of specified MWUs. These tasks are categorized into everyday job-related and personal genres (e.g., memos, messages, greeting cards, diary entries). Academic writing was excluded to match students' A2 proficiency level. This task is designed to assess the learner's ability to produce MWUs within meaningful discourse, targeting productive knowledge of word form (including morphological adaptation), receptive and productive knowledge of meaning (e.g., concept and referent alignment, associative connections), and usage (e.g., grammatical function, appropriate collocation, contextual constraints). While translation is not explicitly required, it may occur implicitly during comprehension and production processes, further supporting vocabulary development. According to Read (2000), such integrative writing tasks allow learners to demonstrate multiple facets of vocabulary knowledge, including understanding, grammatical function, collocation, and productive use (p. 175).

To ensure psychometric soundness, the test adheres to the five core principles of language assessment: practicality, reliability, validity, authenticity, and washback (Brown, 2004; Döring & Bortz, 2016; Messick, 1980, 1989; Weir, 2005). These principles are discussed in detail in Chapter 2. The test is also aligned with legally binding assessment standards under the School Act of North Rhine-Westphalia (§ 48 SchulG and § 70 Para. 4 SchulG[5]), which stipulate that written tasks must assess both communicative sub-competences and linguistic resources.

The two-page test format is adaptable for both digital and paper-based implementation, accommodating schools with varying technological resources. Each task is designed for completion within 30 minutes and corresponds to the task types practiced during the intervention. A detailed scoring rubric, grounded in Nation's (2013a) multidimensional model, has been developed to ensure objectivity and standardization. Tests were pseudonymized and independently rated by two trained teachers and the researcher to enhance inter-rater reliability and mitigate subjective bias.

The test was administered to approximately 250 students across two grammar schools and two comprehensive secondary schools in North Rhine-Westphalia (NRW), ensuring a diverse demographic representation. A preliminary exploratory study was conducted prior to the main implementation to identify and correct procedural inconsistencies.

3.5.4 Scoring Rubric

Assessment and grading practices in education have long grappled with the absence of standardized tools for ensuring consistent application of reference norms. One of the few empirical studies directly addressing this issue is by Husfeldt et al. (2008), who used a questionnaire to evaluate teachers' reliance on substantive grading criteria. Their instrument included statements such as: "All students may receive an above-average grade in a test if the overall class performance is correspondingly good," and "I develop a criteria grid before conducting exams, in which the grades for the expected performances are already predetermined" (p. 15). However, such statements leave terms like "requirements" open to interpretation, which may result in inconsistent grading practices (Ingenkamp, 1977, p. 16; Czinczoll & Hartl, 1989, p. 277).

Although many German federal states adopt grading definitions based on the Standing Conference of the Ministers of Education and Cultural Affairs, Rhineland-Palatinate's Comprehensive School Regulation offers a more differentiated model. It mandates that "achievements are assessed based on the degree of meeting learning

[5] https://bass.schul-welt.de/6043.htm#1-1p48 Retreived on 10.01.2025.

requirements," while also factoring in individual learning progress, effort, and the broader performance context (Ministry of Education, Science, Youth and Culture of Rhineland-Palatinate, 2009, § 53, para. 1). This model integrates criterion-referenced, ipsative, and social reference norms.

Despite such regulatory efforts, practical grading often remains ambiguous. Studies highlight how point-to-grade conversion is still largely subject to teacher discretion (Prasser, 1983, p. 15). Walz (2001, p. 156) critiques grading thresholds above 50% as pedagogically indefensible, whereas Hettel (2002, pp. 424-425) presents a counterexample where a score of 67.1% resulted in a failing grade—a decision legally upheld. This reflects the persistent lack of reliable, standardized grading instruments, particularly for vocabulary tests and other subject-specific assessments.

Given this landscape, this study introduces a carefully constructed, curriculum-aligned scoring rubric to promote fairness, reliability, and transparency. The rubric employs a 100-point scale with six performance bands:

- 0-16 = inadequate (German grade 6 / English F)
- 17-33 = needs improvement (German grade 5 / English F)
- 34-50 = satisfactory (German grade 4 / English D)
- 51-67 = good (German grade 3 / English C)
- 68-84 = very good (German grade 2 / English B)
- 85-100 = excellent (German grade 1 / English A)

The grading of the vocabulary test is curriculum-related and aligns with the highest educational standards. The assessment criteria are based on the reference levels of the Educational standards for the intermediate school certificate in English (2003)—Correction of examinations—English (Korrekturen von Klausuren-Englisch)[6], on the English curriculum (2019) of the Ministry of Education of the federal state NRW of *Gymansium*[7], English curriculum (2022) of the Ministry of Education of the federal state NRW of *Gesamtschule*[8], and on the training and examination regulations for lower secondary level (2015)[9], and the internal school curricula of the four different schools, since the intervention took place in four different

[6] Available on https://www.schulentwicklung.nrw.de/lehrplaene/upload/klp_SII/e/Korrektur_von_Klausuren_Englisch.pdf. Retrieved on 02.03.2025.
[7] Available on https://www.schulentwicklung.nrw.de/lehrplaene/lehrplan/199/g9_e_klp_3417_2019_06_23.pdf. Retrieved on 02.03.2025.
[8] Available on https://www.schulentwicklung.nrw.de/lehrplaene/lehrplan/199/g9_e_klp_3417_2019_06_23.pdf. Retrieved on 02.03.2025.
[9] Available on https://bass.schul-welt.de/12691.htm. Retrieved on 02.03.2025.

schools (two grammar schools and two comprehensive secondary schools). Moreover, the framework was informed by Oelkers' (2001) pedagogical reflections, emphasizing that the long-standing grading scale enables teachers to evaluate within a class-internal reference system.

Each vocabulary test is evaluated by three independent raters: the classroom teachers of the test and control groups, and the researcher. The test consists of two parts: (1) a fill-in-the-gap task (30 points; 30% weight), and (2) a writing task (70 points; 70% weight). In the gap-fill section, each item is scored out of six points. Full marks are awarded for accurate form and usage; half marks for correct placement with form-related errors; and zero for incorrect or misspelled items.

The writing task is scored analytically using a rubric inspired by Nation's (2013a) multidimensional vocabulary model, supported by Nation (2001), Read (2000), and Schmitt (2010). The rubric comprises three macro-categories: lexical accuracy (60 points), communicative text design (6 points), and language correctness (4 points).

Lexical accuracy, the most heavily weighted, is divided into three subdomains: form (20 points) including spelling and morphological construction, meaning (20 points) including lexical range, form-meaning correspondence, referents, and associative links, and use (20 points) including grammatical function, collocation patterns, constraints on use, and contextual appropriateness.

Communicative text design (6 points) assesses overall coherence, creativity, and textual flow. Language correctness (4 points) evaluates grammar and syntactic accuracy. The full scoring rubric was included in Appendix H.

Vocabulary knowledge is conceptualized as a continuum from passive recognition to productive use (Melka, 1997). Research indicates that receptive knowledge generally precedes productive skills (Laufer, 1998; Laufer & Paribakht, 1998), with productive recall marking the highest level of lexical mastery (Laufer & Goldstein, 2004; Aviad-Levitzky et al., 2019). Accordingly, the writing task elicits deep lexical processing, assessing form, meaning, and use in context. Reception of spoken or visually provided forms is not tested. This multifaceted approach reflects Read's (2004a) assertion that robust vocabulary assessments must evaluate semantic depth and lexical relations.

The correction of mistakes is standardized using annotation symbols prescribed by the Ministry for Schools, Education, and the State of NRW (2003). Symbols such as W (inappropriate word), Präp (wrong preposition), Kongr (cohesion), and R (spelling error) are applied systematically. Teachers underline and annotate errors in the margin and use "see above" for repeated issues. Systematic errors are

weighted more heavily than occasional slips, and punctuation is only marked if it impairs meaning.

To accommodate learners with special needs, compensatory measures were applied in accordance with the ZP 10 guidelines (Düsseldorf District Government), the LRS Decree (1991; 2015: BASS 14-01 No. 1), and the training regulations under Article 3, Paragraph 3 of the Basic Law. These include 25% extended time (ca. 7.5 minutes) and alternative testing rooms for reduced distraction. Eligibility was confirmed by teachers and documented through medical certification prior to the intervention. Compensation applied to students with diagnosed learning disabilities (e.g., LRS), chronic illnesses, autism spectrum disorders, or short-term impairments (e.g., broken hand). Dyscalculia did not qualify for accommodation.

The intervention comprised eight lessons, each centered on one pop song and its corresponding MWUs. The eight songs were drawn from the corpus developed for this research, which comprised 56 analyzed pop songs. This corpus was divided into seven boxes (Box 1–7), each containing eight songs grouped according to tempo, speech rate, song length, and mean speed. To ensure comparability across groups, all parameters were normalized using min–max scaling, and an algorithm minimized internal variance within each box. Details of the classification process and the MATLAB script are provided in Appendix I (Table I1), while the song distributions and characteristics are presented in Tables I2–I8.

3.6 Validation of the Materials, Worksheets, and Instruments

To ensure the validity and quality of all instruments and materials used in the intervention, a triangulated validation approach was adopted, in line with the recommendations of Caspari et al. (2016). This process employed the "Thinking Aloud" method—a qualitative validation technique—across a range of stakeholders, including pupils, teachers, and academic experts affiliated with Paderborn University. The integration of qualitative and quantitative elements adheres to Denzin's (1970) principles of methodological triangulation within quantitative research, enabling a rigorous, multi-perspective assessment.

The validation was conducted through a series of online and in-person sessions held in November and December 2023. The results of this process have been systematically documented and are accessible via the following link: Validation Materials – Google Drive. The academic validation team included Dr. Thomas Janzen, PhD candidate Maike Bauer, and PhD candidate Dagmar Keatinge (University of Paderborn). The teacher team comprised Isabella Magusiak (English and Mathematics), Sonja Oellers-Lyttle (English and Pedagogy), and Rebecca Stürwald (English

and Geography), all certified secondary school teachers from Rupert Neudeck Gesamtschule with Bachelor and Master of Education degrees and completed governmental teacher training (*Referendariat*).

To ensure student confidentiality, all procedures were conducted in accordance with the ethical guidelines approved by the Ethics Review Board of the University of Paderborn. Only anonymized identifiers and recent English subject grades were recorded for analysis (e.g., DUME1118 [Grade 1], LUNE1118 [Grade 4], AIRI1218 [Grade 1], GITI1118 [Grade 4], DALM1018 [Grade 3], MERG1118 [Grade 4], SONN1118 [Grade 5], EMTE1218 [Grade 6], LERS1218 [Grade 2], and MAOR1018 [Grade 4]).

The validation process prompted several revisions to the pre- and post-intervention questionnaires to ensure improved clarity, cultural relevance, and developmental appropriateness for secondary school pupils. For instance, the item "Ich war seit Beginn der Sommerferien 2023 in einem Land, wo man Englisch spricht" was revised to "Ich war seit Beginn der Sommerferien 2023 im englischsprachigen Ausland (z.B. USA, Vereinigtes Königreich, Kanada, Australien)" to more clearly delimit English-speaking countries. Following a student suggestion, Billie Eilish was introduced as an exemplar of English-language pop culture to increase student engagement. In consultation with a teacher of English and Philosophy, the phrasing "Ich habe ein normales Gehör" was replaced with the more inclusive "Ich habe ein nicht beeinträchtigtes Gehör" to prevent possible discomfort for students with hearing impairments.

Additionally, one item assessing students' perceptions of the broader benefits of music instruction was reworded to improve comprehension. The initial phrasing—"Ich glaube, dass Musikunterricht … andere Aspekte meines Lebens … fördern kann"—was revised to: "Ich glaube, dass Musikunterricht (zum Beispiel Privatunterricht, Musikschule) positive Einflüsse auf andere Bereiche meines Lebens haben kann, wie zum Beispiel beim Lernen, der Konzentration oder der Entspannung." These changes helped ensure the questionnaires were both linguistically accessible and construct—valid for the target demographic.

Adjustments to the vocabulary test aimed to reduce cognitive load while maintaining assessment integrity. For the gap-filling task, the original instruction—"Read the text below and fill in the gaps with the correct multi-word units. Make sure to change them to match the right number (singular or plural) and verb tense (present or past)"—was simplified to: "1. Read the text below and fill in the gaps with the correct multi-word units from the grey box. 2. Put the verbs in the simple past when needed (e.g., 'We do it' → 'We did it')." The reference to singular/plural adjustments

was removed based on initial trial feedback, which indicated that it created an unnecessary barrier to performance for A2-level learners.

Similarly, for the writing task (Task 2), the instruction was changed from "Write a short story..." to "Write a short text...," and students were asked to incorporate the MWUs provided in a grey box. The visual formatting enhancement (i.e., grey box) was introduced to better organize the target expressions and aid visual focus. An accompanying image of four friends, originally intended as a writing prompt, was removed to avoid limiting students' creative freedom and genre imagination.

All vocabulary test materials were reviewed and linguistically revised by Sean Davies, a native English speaker and research assistant in the English department of the University of Sydney. These revisions helped ensure appropriate language level, idiomatic accuracy, and syntactic clarity.

All lesson materials—worksheets, help cards, slide presentations, and teacher prompts—underwent a comprehensive review for linguistic accuracy, age suitability, and alignment with the A2 CEFR level. MWUs above this proficiency level were either simplified or footnoted with translations. Footnotes were styled according to the University of Oxford Style Guide (2016, p. 27f), using lowercase for English entries and capitalizing German translations only when they were proper nouns.

The help cards were linguistically simplified and restructured into three-step instructions to enhance clarity. Phrases such as "Once upon a time" were replaced with more neutral alternatives to avoid genre constraints not supported by the curriculum. In gap-fill worksheets, specific MWUs to be used more than once were clearly indicated using parentheses. Furthermore, the accompanying image previously located next to the writing section was repositioned to the instruction area to inspire ideas while maintaining narrative openness.

To streamline implementation, the pseudonymization protocol was simplified. Originally based on the third and fourth letters of students' surnames, the rule was revised to use the first and second letters, reducing confusion and improving completion accuracy.

Based on teacher feedback, an intervention overview document was created and distributed. This overview outlines the objectives, instructional sequence, and key activities of the intervention, serving as a reference guide to support clarity, consistency, and coordination across classrooms.

In sum, the triangulated validation process ensured that all instruments and instructional materials used in the study were pedagogically and linguistically appropriate, and tailored to the cognitive and emotional needs of the student participants. These refinements enhanced both the accessibility and effectiveness of the interven-

tion, laying the foundation for robust data collection and meaningful learning outcomes.

CHAPTER 4: FIRST STUDY

The first study was conducted at Rupert Neudeck Gesamtschule from October 16, 2023, to October 27, 2023. Over two weeks, the intervention was implemented across eight English lessons in accordance with the lesson plan and study design of the research project. This research project investigated the extent to which vocal training with English pop songs enhances lower secondary EFL learners' receptive and productive knowledge of English multi-word units (MWUs) using a within-subjects design. As an initial exploration, it also established a methodological foundation for future research involving a control group to enable more robust comparisons.

To prepare for the intervention, a two-hour preparatory session was conducted at the beginning of the study. In addition, pupils created their pseudo-anonymous identification codes, expert groups were defined, and songs were assigned to each expert group. An overview of the intervention materials was provided, which included instructions for preparing the presentation, cards for the presentation, worksheets for the MWUs of today. Two examples of MWU presentations were demonstrated—one live and the other through a recorded video. Following the intervention, an additional hour was allocated to administer the T1 and the post-intervention questionnaire.

The first study initially included 28 pupils; however, only 21 participants were included in the data analysis. Seven pupils were excluded due to their absence from one or more intervention sessions.

This chapter presents a comprehensive analysis of the first study, detailing the data collection process, statistical analyses, and key findings. The chapter begins with a description of the study's implementation, including sample characteristics and data collection procedures. This is followed by a quantitative analysis utilizing *t*-tests and ANCOVA, where the effect size of the first study is estimated. Additionally, the anticipated effect size for the second study is predicted, and the minimum required sample size is determined based on power analysis. Beyond the primary statistical analyses, the chapter explores supplementary data that may contribute to addressing research questions 2 and 3 in the second study. A qualitative report is also presented, incorporating self-reflection and documenting modifications to the study design based on the first study's findings. The chapter concludes with a summary of key insights, providing a foundation for refining the second study's methodology and ensuring an optimized intervention.

4.1 Sample Characteristics

As reported in the introduction of this chapter, only 21 pupils were taken into account for the evaluation of the first study data. The following pupils were excluded by the analysis of the data because they missed one (or more than one) class: LERS1218, MAER1218, NOMI1218, AYAR0918, AIRI1218, SVIEW1118, AYAI1218. This phenomenon is known as experimental mortality (Pelham & Blanton 2013, p. 143). From a statistical point of view, this is a problem, as a smaller sample size diminishes statistical power, i.e., the "ability of a test to detect an effect of a particular size" (Field 2013, p. 881) and hence also reliability.

Table 12. *Subject Frequency Distribution*

Groups	N	in %
Total number of participants	28	100 %
Total number of missed participants	7	25 %
Total number of missed participants in the first study	21	75 %

Table 13. *Frequency Distribution of Subject Variables*

	Gender	First langauge (L1)/ bilingualism	Exposure to English outside the school	Exposure to English pop songs	Musical training
Valid	21	21	21	21	21
Missing	0	0	0	0	0

4.1.1 Data collection

The following section presents Tables 14-19, which display subject frequencies, frequencies of subject variables, and distributions of key variables, thereby providing a comprehensive overview of the collected data.

Table 14. *Gender Distribution of Participants*

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Boys	12	57.1	57.1	57.1
	Girls	9	42.9	42.9	100.0
	Total	21	100.0	100.0	

Table 15. *First Language and Bilingualism Distribution*

Mother Tongue(s)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	German only	8	38.1	38.1	38.1
	German+	6	28.6	28.6	66.7
	No German	3	14.3	14.3	81.0
	English+	4	19.0	19.0	100.0
	Total	21	100.0	100.0	

Table 16. *Distribution of Exposure to English Outside the School*

Exposure to English Outside the School					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very rare	4	19.0	19.0	19.0
	Rare	8	38.1	38.1	57.1
	Occasionally	3	14.3	14.3	71.4
	Often	3	14.3	14.3	85.7
	Very often	3	14.3	14.3	100.0
	Total	21	100.0	100.0	

Table 17. *Distribution of English Pop Song Exposure*

Exposure to English Pop Songs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very rare	1	4.8	4.8	4.8
	Rare	2	9.5	9.5	14.3
	Occasionally	3	14.3	14.3	28.6
	Often	6	28.6	28.6	57.1
	Very often	9	42.9	42.9	100.0
	Total	21	100.0	100.0	

Table 18. *Distribution of Musical Training*

Musical Training

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	16	76.2	76.2	76.2
	Yes, with no practice	2	9.5	9.5	85.7
	Yes, with rarely practice	1	4.8	4.8	90.5
	Yes, with regularly practice	1	4.8	4.8	95.2
	Yes, with daily practice	1	4.8	4.8	100.0
	Total	21	100.0	100.0	

Table 19. *Summary of Key Subject Variables and Distributions*

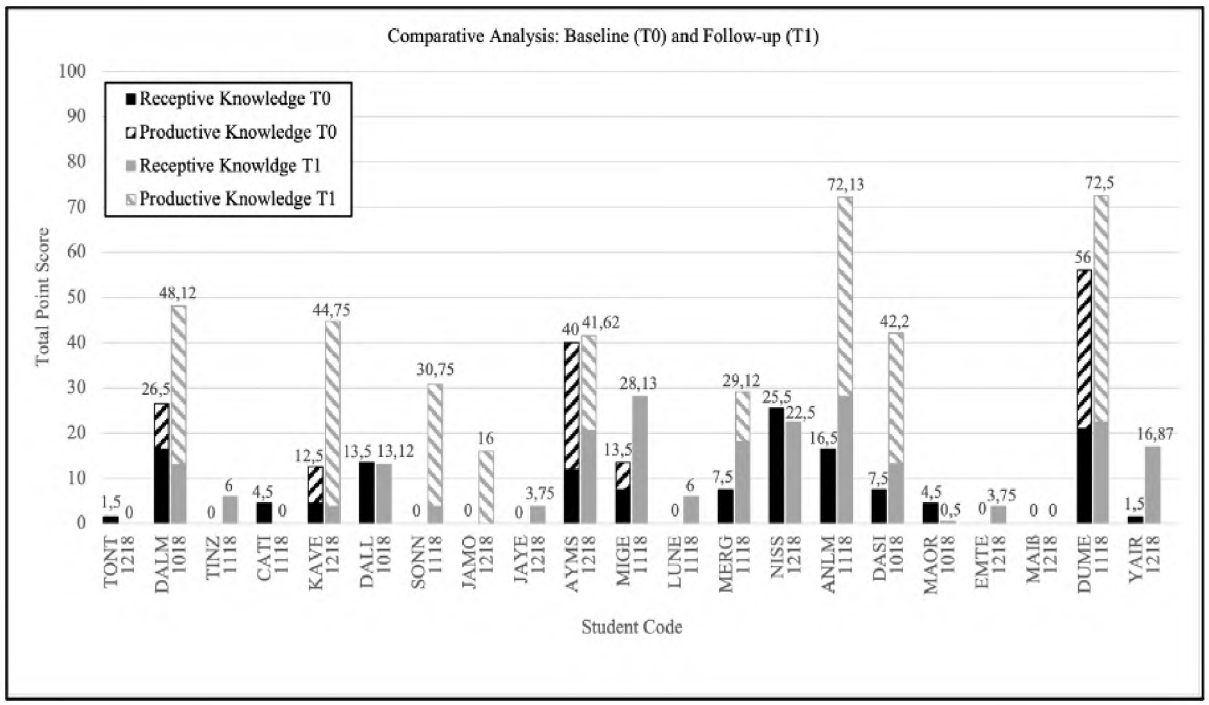
N	M Age (SD, SE)	Partic-i-pants' sex	L1/ bilin-gualism	Exposure to English outside the school	Exposure to English pop songs	Musical training	Fre-quency of mu-sical train-ing
21	11,37 (11.42, 0.14)	F (9, 42.9 %) M (12, 57.1 %)	German only (8, 31.1 %) German + (5, 23.8 %) No Ger-man (4, 19.05 %) English + (4, 19.05 %)	Very rare (4, 19.05 %) Rare (8, 38.10 %) Occasion-ally (3, 14.29 %) Often (3, 14.29 %) Very often (3, 14.29 %)	Very rare (1, 4.76 %) Rare (2, 9.52 %) Occasion-ally (3, 14.29 %) Often (6, 28.57 %) Very often (9, 42.86 %)	Yes (4, 19.05 %) No (17, 80.95 %)	Rarely (1, 4.76 %) Regu-larly (1, 4.76 %) Daily (1,4 .7 6 %) No in-dica-tion (1, 4.76 %)

4.1.2 T0 (Pre-Test) and T1 (Post-Test) Data

Before delving into a detailed statistical analysis, an overview of pupils' performance on the tests (T0 and T1) across productive and receptive knowledge domains is presented (Figure 1).

The assessments at both T0 (pre-test) and T1 (post-test) included two components: a fill-in-the-gap task to assess receptive vocabulary knowledge and a writing task to evaluate productive vocabulary knowledge. The corrections followed a rigorous procedure, involving review and approval by two teachers and the researcher to ensure accuracy and reliability. This process was guided by the scoring rubric outlined in Chapter 3, which served as a consistent template aligned with the protocols of the second study.

Figure 1. *Comparative Analysis of Receptive and Productive Knowledge at T0 and T1*



Overall, the results highlight a clear improvement in scores at T1 across both receptive and productive knowledge for most pupils, though some exceptions remain where progress is limited or absent.

Specifically, regarding the receptive knowledge scores, T0 scores scores were generally low, with several pupils (e.g., TINZ 1118, SONN 1118, LUNE 1118, JAMO 1218, MAIß 1218, and EMTE 1218) scoring 0 points. Only a few pupils, namely DALM1018 with 16.5, DALL1018 with 13.5, NISS1218 with 25.5, ANLM118 with 16.5, DUME1118 with 21.30, achieved moderate scores. Concerning the receptive knowledge of T1, there was a noticeable improvement in receptive knowledge for most pupils, particularly MIGE 1118 progressed from T0 to 28.13 in T1, AYMS1218 from 12.0 to 20.62, MIGE1118 from 7.5 to 28.13, MERG1118 from

7.5 to 28.12, ANLM1118 from 16.5 to 28.13, YAIR1218 from 1.5 to 16.87. However, some pupils showed minimal or no improvement, for example DALM1018 with 16.5 in T0 and 13.12 in T1, TINZ1118 with 0 in T0 and 6 in T1, KAVE1218 with 4.5 and 3.75 in T1, JAMO1218 with 0 in T0 and 0 in T1, JAYE1218 with 0 in T0 and 3.75 in T1, MAIß1218 with 0 in T0 and 0 in T1, DUME1118 with 21 in T0 and 22.5 in T1. In contrast to receptive knowledge, productive knowledge scores at T0 were generally higher. Notable scores were perfomed by MIGE1118 with 28.13, MERG1118 with 28.12, ANLM1118 with 28.13.

Regarding T1, many pupils showed improvements in productive knowledge scores: DALM1018 with 10 in T0 and 35 in T1, KAVE1218 with 8 in T0 and 41 in T1, SONN1118 from 0 in T0 and 27 in T1, ANLM1118 from 0 in T0 to 44 in T1, DASI1018 from 0 in T0 to 29 to T1, DUME1118 from 35 in T0 to 50 in T1. Despite these gains, some pupils showed no progress, maintaining 0 points in productive knowledge at both T0 and T1. These include TONT1218, TINZ1118, CATI1118, DALL1018, JAYE1218, LUNE1118, NISS1218, MAOR1018, ETE1218, MAIß1218, YAIR1218.

In general, there is a consistent disparity between productive and receptive knowledge scores, with productive konwledge generally higher at both T0 and T1. Finally, the results reveal that productive knowledge is generally more developed than receptive knowledge across pupils. While significant improvements are evident between T0 and T1 for many pupils in both domains, a subset of pupils continued to exhibit minimal or no progression.

4.1.3 Descriptive Statistics of the Continuous Variables

The variable T0 (total score of the pre-test), T1 (total score of the post-test) are continuous by nature. The variables exposure to English outside the school, exposure to English pop songs, and musical training are categorical but ordinal. Since we can range these categories in increasing order, they were considered as continuous as well (Robitzsch, 2020). Table 20 shows the descriptive statistics of the continuous variables.

Table 20. *Descriptive Statistics for Continuous Variables*

	Total score T0	Total score T1	Exposure to English outside the school	Exposure to English pop songs	Musical training
Mean	11	24.6895	1.67	2.95	0.52
Median	4.5	16.87	1	3	0
Std. Error of Mean	3.2725	5.13787	0.295	0.263	0.245
Kurtosis	3.213	-0.498	-0.878	0.306	4.536
Skewness	1.816	0.739	0.544	-1.043	2.274
Std. Error of Kurtosis	0.972	0.972	0.972	0.972	0.972
Std. Error of Skewness	0.501	0.501	0.501	0.501	0.501
N	21	21	21	21	21
Z-score of Kurtosis	3.31	-0.51	-0.90	0.31	4.67
Z-score of Skewness	3.62	1.48	1.09	-2.08	4.54

A Z-score of skewness greater than 1.96 for the outcome variable suggested potential non-normality in the data distribution. Therefore, bootstrapping was applied to ensure robust statistical estimates despite deviations from normality. Bootstrapping involves random resampling with replacement from the existing dataset to generate multiple samples, from which results are averaged. This method is widely recommended to address issues related to non-normal distributions, outliers, and small sample sizes (Field & Wilcox, 2017). However, bootstrapping was not used to address missing data, as it resamples only from available observations rather than imputing missing values. Consequently, the 28 students who had incomplete data at T0 or T1 were excluded from the bootstrapping procedure, as their records did not permit meaningful resampling.In addition to addressing statistical considerations, it is essential to examine key demographic variables that may influence the analysis. Gender and L1/bilingualism are nominal variables and, as such, can only be treated as categorical variables. Understanding their distribution is critical for interpreting potential effects on MWU learning. Table 21 provides an overview of the distribution of responses across categories for all nominal and ordinal variables.

Table 21. *Subject Characteristics Distribution by Category*

Variables/categories	Count	%
Gender		
Masculine	12	57.14
Feminine	9	42.86
L1/ Bilingualism		
German only	8	38.10
German+	6	28.57
No German	3	14.29
English+	4	19.05
Exposure to English Outside the school		
Very rare	4	19.05
Rare	8	38.10
Occasionally	3	14.29
Often	3	14.29
Very often	3	14.29
Exposure to English Pop Songs		
Very rare	1	4.76
Rare	2	9.52
Occasionally	3	14.29
Often	6	28.57
Musical Training		
No	16	76.19
Yes, with no practice	2	9.52
Yes, with rarely practice	1	4.76
Yes, with regularly practice	1	4.76
Yes, with daily practice	1	4.76

Taking into account the distribution of subjects' characteristics across categories (Table 21), it is evident that the variable musical training exhibits low variability. A total of 76% of subjects reported having "no musical training at all," while only five subjects indicated some level of musical training: two reported "Yes, with no practice," one reported "Yes, with rare practice," one reported "Yes, with regular

practice," and one reported "Yes, with daily practice." This limited distribution suggests that, within the current sample, the influence of musical training may not be adequately represented, potentially limiting its explanatory power in the analysis. However, with the larger sample size in the main intervention (approximately 250 subjects), a more diverse distribution of musical-training levels was expected. This increased variability was anticipated to allow for a more robust examination of the potential effects of musical training on MWU learning, addressing the current limitation and improving the generalizability of the findings.

4.2 Results

4.2.1 Paired *t*-test: The General Effect of the Intervention

The time variable stands for the intervention because data had two measures: before and after the intervention. For that reason, having paired observations, the paired *t*-test is suitable (Mishra et al., 2019) for a simple check whether the average scores significantly changed after intervention.

The average of total score after the intervention was 24.69 (between 15.67 and 35.23) while before intervention was 11.00 (between 5.57 and 17.97). Paired *t*-test with bootstrapping of 1000 samples indicated the increasing of average total score with time (intervention) which was statistically significant (Figure 2) with ΔT = 13.69 (7.25 20.65), $t(20) = 3.91$, $p = 0.006$.

Figure 2. *Pre-test (T0) vs. Post-test (T1) Multi-Word Units Scores*

Paired Samples Statistics

				Bootstrap[a]			
						95% Confidence Interval	
			Statistic	Bias	Std. Error	Lower	Upper
Pair 1	Total Score T1	Mean	24.6895	.1881	4.9010	15.6659	35.2332
		N	21				
		Std. Deviation	23.54468	-.63429	3.05446	16.61301	28.49648
		Std. Error Mean	5.13787				
	Total Score T0	Mean	11.000	.108	3.184	5.573	17.974
		N	21				
		Std. Deviation	14.9967	-.6055	3.4224	7.6056	20.2543
		Std. Error Mean	3.2725				

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

The effect size (Cohen's $d = 0.49$) calculated from the first study, as shown in Figure 3, indicates a medium effect according to Cohen's conventions (Cohen, 1988).

Figure 3. *Cohen's d Effect Size for Multi-Word Unit Learning Gains*

$$D=\frac{x1-x2}{\sqrt{sd1^2-sd2^2}}=\frac{13.68}{\sqrt{23.54^2-15.00^2}}=0.49$$

The medium effect size observed in the first study provides a reasonable basis for anticipating a similar effect in the second study. Accordingly, this effect size will inform the power analysis used to estimate the required sample size, guiding methodological planning and statistical power considerations for the upcoming study.

4.2.2 ANCOVA

A mixed factorial ANCOVA was conducted to examine the effects of the intervention while controlling for covariates. Given the relatively small sample size ($N = 21$), the results should be interpreted with caution, as smaller samples may reduce statistical power and increase the risk of Type II errors (Tabachnick & Fidell, 2013).

Before conducting ANCOVA, key assumptions were tested to ensure the validity of the analysis. Normality was assessed through skewness and kurtosis values at T0 and T1. At T0, total scores exhibited moderate positive skewness (1.68) and a leptokurtic distribution (kurtosis= 2.22), indicating deviations from normality and the presence of a peaked distribution with heavy tails. In contrast, at T1, the distribution became more symmetrical, with a reduced skewness of 0.68 and a kurtosis of -0.67, suggesting a more uniform spread of scores and a trend toward normality (Field, 2018; Tabachnick & Fidell, 2019). These changes indicate that the intervention may have contributed to stabilizing the data distribution, which strengthens the validity of subsequent analyses. However, given that some deviations from normality persisted, potential limitations should be acknowledged when interpreting ANCOVA results.

Levene's test for homogeneity of variances yielded a statistically significant result ($F(1, N-2) = 4.44$, $p = 0.041$), indicating a violation of the equal variances assumption (Levene, 1960). This suggests that the variability of total scores differed between conditions, which may introduce heteroscedasticity into the analysis. Such

violations can lead to inflated Type I error rates and affect the reliability of ANCOVA estimates. Consequently, ANCOVA results should be interpreted with caution, and alternative statistical approaches, such as robust MANCOVA or nonparametric methods, may be considered in future research to address this issue.

Additionally, the homogeneity of regression slopes assumption was tested by including an interaction term between the covariate (total score T0) and the independent variable in a preliminary ANCOVA model. The interaction effect was statistically significant ($F(1, N-2) = 23.13$, $p = 0.0001$), indicating that the relationship between the covariate and the dependent variable was not consistent across groups (Maxwell & Delaney, 2004). This suggests that the effect of the covariate on the outcome variable varied depending on the intervention, violating a fundamental assumption of ANCOVA. When this assumption is violated, ANCOVA-adjusted means may not accurately reflect the true group differences, and the validity of the statistical conclusions can be compromised. A significant interaction of this nature indicates that the groups may differ not only in their mean scores but also in how they respond to the covariate, further complicating interpretation.

The assumption checks indicate that while the intervention contributed to a more normalized data distribution, key ANCOVA assumptions—homogeneity of variances and homogeneity of regression slopes were violated. The significant Levene's test result suggests that the variance of total scores differed between conditions, which may lead to biased standard errors and an increased risk of Type I errors. Similarly, the violation of the homogeneity of regression slopes assumption implies that the relationship between the covariate and the dependent variable was not uniform across groups, affecting the interpretability of adjusted means and potentially inflating effect size estimates. These violations limit the extent to which ANCOVA can provide reliable estimates of the intervention effect.

Given these methodological concerns, the ANCOVA results should be interpreted with caution. Despite these limitations, the observed improvements in normality at T1 and the significant intervention effect indicate that the study's findings remain informative and provide a valuable basis for further research in this domain. The detailed outcomes of this statistical analysis are comprehensively presented in Table 22.

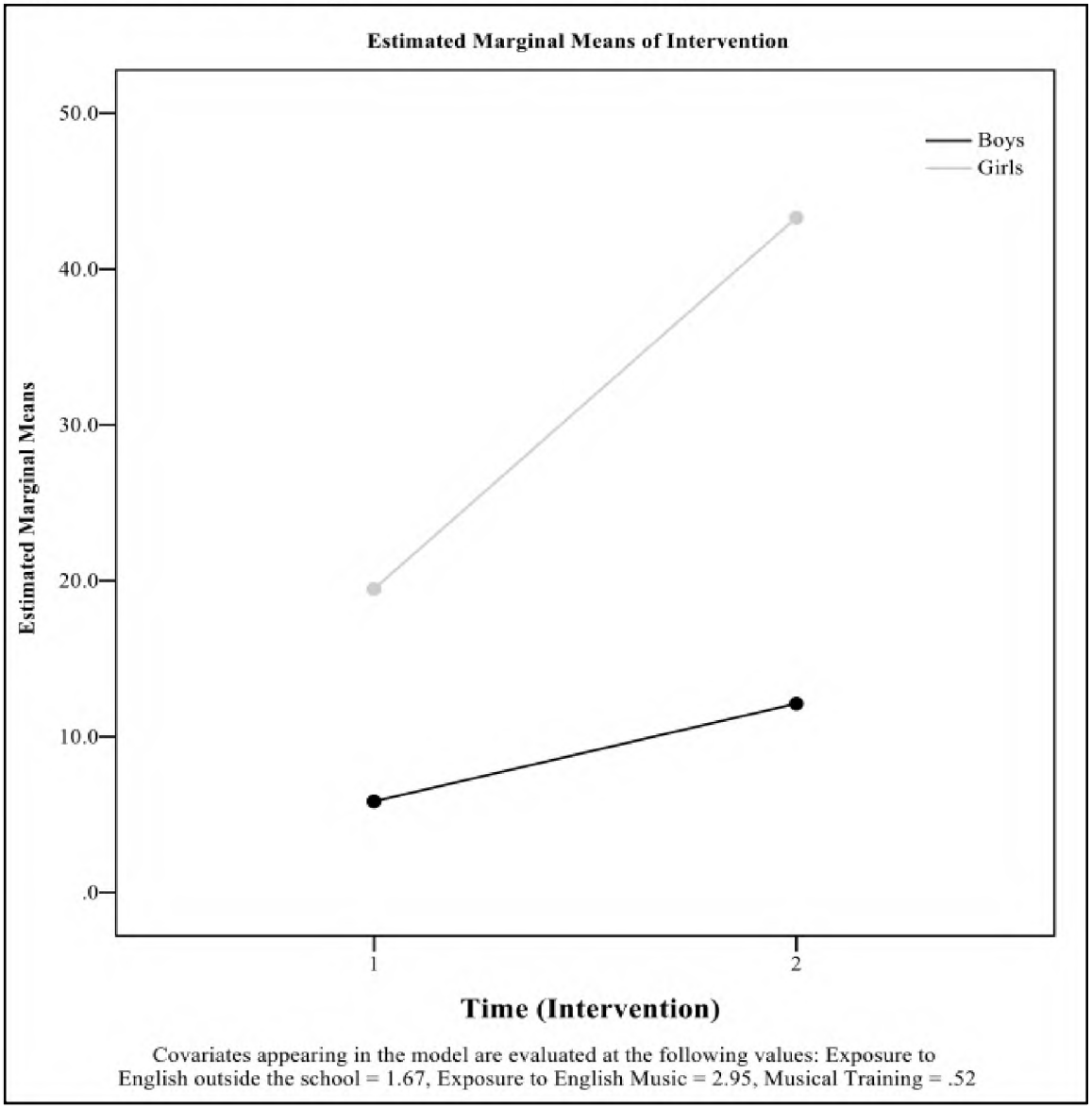
Table 22. *Mixed Factorial ANCOVA Results*

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared
Intervention	583.169	1	583.169	5.695	0.033	0.305
Intervention * Gender	707.23	1	707.23	6.907	0.021	0.347
Intervention * L1/ Bilingualism	227.577	3	75.859	0.741	0.546	0.146
Intervention * Exposure to English Outside the School	28.506	1	28.506	0.278	0.607	0.021
Intervention * Exposure to English Pop Songs	110.739	1	110.739	1.082	0.317	0.077
Intervention * Musical Training	284.88	1	284.88	2.782	0.119	0.176
Gender	4607.742	1	4607.742	15.301	0.002	0.541
L1/ Bilingualism	2892.278	3	964.093	3.201	0.059	0.425
Exposure to English Outside the School	0.932	1	0.932	0.003	0.956	0.000
Exposure to English Pop Songs	1684.335	1	1684.335	5.593	0.034	0.301
Musical Training	1321.402	1	1321.402	4.388	0.056	0.252

As per Table 22, the observed significance of time (intervention) substantiates the notion that the intervention had a considerable impact on the total score, aligning with the *t*-test results.

Figure 4 further demonstrates that gender was a significant variable, with a marked difference between males and females already at T0. Additionally, the interaction between the intervention and gender was significant, indicating that the intervention's effect differed substantially between males and females. Specifically, the effect was more pronounced for girls (with a change in total score of 23.84, from 43.31 to 19.47) compared to boys (with a change in total score of 6.28, from 12.12 to 5.84).

Figure 4. *Intervention Effect across Gender Groups*



These observed results align with established findings on gender differences in cognitive processing and brain structure. Female brains exhibit increased gray matter in language-related regions, such as the posterior temporal lobes and Heschl's gyri (Gur et al., 1999; Schläpfer et al., 1995), along with higher neuronal density in the temporal cortex (Witelson et al., 1995). These structural features support greater verbal memory and fluency, as well as enhanced interhemispheric connectivity through a larger corpus callosum and anterior commissure (Allen & Gorski, 1991; Bishop & Wahlsten, 1997). Conversely, men exhibit greater left hemisphere dominance for verbal functions and have an 11% larger total brain volume (Luders et al., 2005; Ruigrok et al., 2014), which influences cognitive processing strategies.

These findings have direct implications for vocabulary acquisition, particularly in a music-based vocabulary learning approach. The stronger reliance on declarative memory in females (Ullman, 2004; Hartshorne & Ullman, 2006) may facilitate word learning through song lyrics, as they rely on rote memorization and pattern recognition, which align with the structure of musical training. This memory advantage is reflected in word learning studies, where girls outperform boys in verbal recall tasks as early as five to seven years old (Kaushanskaya et al., 2013). Additionally, gender differences in emotional processing (Duckworth & Seligman, 2006; Matthews et al., 2009) suggest that girls experience greater emotional engagement with music, which can enhance motivation and retention of linguistic material.

In music education, these cognitive and emotional factors contribute to observable gender-based trends in musical engagement and preference. Girls demonstrate higher musical involvement, favoring rhythmic and melodic genres such as pop music, whereas boys exhibit a stronger preference for rock and jazz (Finnas, 1989; Dobrota & Reić Ercegovac, 2009). Furthermore, girls tend to have more accurate pitch recognition and positive attitudes toward classroom music instruction, whereas boys frequently face challenges related to delayed maturity and singing difficulties (Götze & Horii, 1989; Trollinger, 2021).

These insights suggest that gender-based differences in cognitive processing, memory systems, and musical preferences may influence the effectiveness of a music-based vocabulary learning approach. Given that girls engage more with melodic learning formats and rely more on declarative memory, they may benefit more from music-based interventions. In contrast, boys, who tend to rely more on procedural memory and show different engagement patterns in music education, may require alternative instructional approaches to optimize both engagement and vocabulary acquisition.

The interaction of time (intervention) with other variables was statistically insignificant. Table 22 indicates that exposure to English pop songs has a significant

effect on total score. On the other hand, considering that only two subjects have submitted "Yes, with no practice," one" Yes, with rarely practice," one subject "Yes, with regular practice," one subject with "Yes, with daily practice," the results can change with the large sample in the second study. L1/bilingualism and musical training are significant at a marginal significance level 0.1 (Noymer, 2008) but it was expected that these variables would become significant with a larger sample size in the second study.

4.2.3 Power Analysis

A key outcome of the quantitative analysis—comprising both *t*-tests and ANCOVA—was the identification of appropriate sample size requirements for the main study, based on the observed effect sizes. The intervention yielded a medium effect size for the *t*-test and a large effect size for ANCOVA, underscoring the need for sufficient statistical power in future analyses. To achieve a statistical power of 0.80, the following sample size estimates were determined using G*Power software (Figures 5 and 6). For a paired-sample *t*-test, a minimum of 34 participants is required. For an ANCOVA incorporating gender and L1/bilingualism as between-subject factors (resulting in 8 groups: 4 levels × 2 levels), a total of 120 participants is necessary to detect a large effect.

In concluding the evaluation of the pilot study, a medium effect size was adopted for power estimation to ensure conservative yet robust statistical planning for the second study, thereby supporting the reliability and validity of the forthcoming analyses.

Figure 5. *Minimum Sample Size Calculation for Paired t-Test Size*

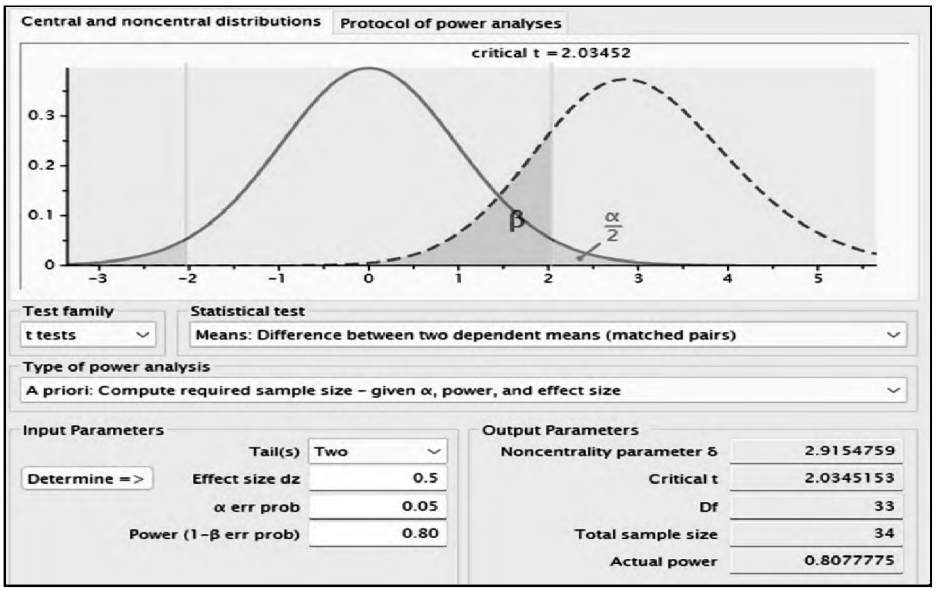
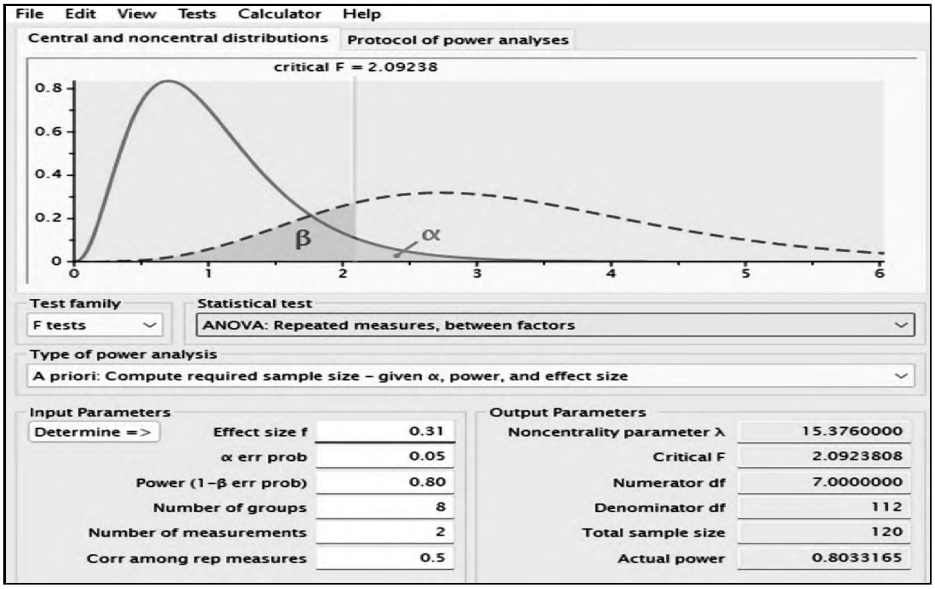


Figure 6. *Minimum Sample Size Calculation for ANCOVA*



4.3 Discussion of First Study's Results

This study examined the impact of vocal training with English pop songs on the receptive and productive knowledge of MWUs among lower secondary EFL learners. The findings revealed a statistically significant improvement in vocabulary scores ($\Delta T = 13.69$, $t(20) = 3.91$, $p = 0.006$) with a medium effect size (Cohen's $d \approx 0.5$). Given that effect sizes above 0.4 are considered meaningful in educational research (Hattie, 2009, 2012, 2015; Marzano, 1998, 2003; Kraft, 2020), these results suggest that the music-based approach had a moderate yet practical impact on MWU learning, warranting further investigation.

To accurately interpret these findings, it is essential to contextualize effect sizes within established research conventions. Standardized thresholds provide a critical framework for assessing the magnitude of an intervention's impact, facilitating comparisons with existing pedagogical approaches. Cohen (1988) introduced conventional benchmarks, defining a small effect size as 0.20, a medium effect size as 0.50, and a large effect size as 0.80. These thresholds have been broadly applied in education and behavioral sciences. Similarly, Hedges and Olkin (1985) proposed the same classification, reinforcing the utility of these effect size conventions in meta-analytical research. In contrast, Glass et al. (1981) suggested slightly lower thresholds, with 0.10 representing a small effect size, 0.30 a medium effect size, and 0.50 a large effect size, particularly in social science research.

In the field of education, specific benchmarks have been established to contextualize the significance of effect sizes. Hattie (2009, 2012, 2015), synthesizing over 800 meta-analyses on educational interventions, identified 0.40 as the average

effect size in education, suggesting that interventions exceeding this threshold have a greater-than-average impact on student achievement. Similarly, Marzano (1998, 2003) reported an average effect size of 0.42 for instructional strategies, reinforcing the idea that effect sizes in the range of 0.40 and above indicate meaningful pedagogical benefits, particularly in domains characterized by incremental learning, such as vocabulary learning. Recognizing that Cohen's benchmarks may not align with effect sizes typically observed in educational interventions, Kraft (2020) proposed a revised framework tailored to the field of education. His adjusted thresholds classified small effects as less than 0.05, medium effects between 0.05 and 0.20, and large effects as greater than 0.20.

Despite these well-established benchmarks, many studies in music-based vocabulary learning have not provided effect size calculations, making comparisons difficult and limiting meta-analytical evaluations. A review of empirical research (Table 4 in Chapter 2) reveals that most studies in this field have not reported exact quantitative measures of vocabulary gains. For instance, Medina (1990), one of the most frequently cited studies on music-based vocabulary learning, provided qualitative insights into the motivational benefits of music but did not include effect size calculations or detailed statistical analyses of vocabulary gains. Similarly, research by Legg (2009), Salcedo (2010), and Good et al. (2015) reported significant vocabulary gains following music-based instruction but did not quantify these outcomes using standardized measures such as Cohen's *d*, further underscoring the difficulty of drawing direct comparisons across research findings.

The lack of comprehensive empirical data and standardized effect size reporting highlights a significant gap in the field, limiting meta-analytical evaluations and making it difficult to establish robust empirical benchmarks for the impact of music-based vocabulary learning. Given this absence of prior effect size data, predicting an expected effect size for the present study was not feasible. Unlike other domains in language education research where established benchmarks guide effect size expectations, music-based vocabulary instruction remains an under-researched area in terms of quantitative assessment. Consequently, this study serves as a pioneering effort by providing empirical evidence with a standardized effect size, offering a reference point for future research.

Given the findings of the first study, it was reasonable to expect a medium to large effect size (Cohen's $d = 0.5$ to 0.8) in the second study. This expectation is grounded in the medium effect size observed in the initial study (Cohen's $d \approx 0.5$), which suggests that the intervention had a significant impact on MWU learning. The second study's larger sample size ($N \approx 200$) will enhance statistical power, reducing the standard error and increasing the precision of the effect size estimate. Addition-

ally, methodological refinements—such as improved statistical modeling to address ANCOVA assumption violations and heteroscedasticity—may yield more reliable results. While the sample size does not directly influence the effect size, these enhancements in design and implementation may lead to a slightly stronger observed effect (e.g., $d \approx 0.7–0.8$).

Beyond the limitations in empirical data and standardized effect size reporting, these results align with previous studies (Legg, 2009; Medina, 1990; Salcedo, 2010) highlighting the promising role of music in vocabulary instruction. Medina (1990) found that music-based approach yielded retention rates comparable to non-music-based approach. However, as Kilgour et al. (2000) and Racette & Peretz (2007) argue, the efficacy of musical interventions depends on cognitive load, learner engagement, and presentation rate, which may explain individual variability in student performance.

The observed MWUs gains support Wallace's (1994) chunking hypothesis, which posits that music structures linguistic input into manageable units, facilitating recall. This aligns with findings from Deutsch (1999) and Ludke et al. (2013), who demonstrated that rhythm and melody enhance vocabulary retention. Similarly, Thaut et al. (2005) and Salcedo (2002, 2010) showed that rhythm improves speech segmentation, aiding both vocabulary recall and retrieval.

A notable finding from the first study is that female participants outperformed males in MWU gains, aligning with research on declarative memory advantages in women (Kaushanskaya et al., 2013; Ullman, 2004). Neurocognitive studies (Gur et al., 1999; Luders et al., 2005) suggest that females exhibit higher gray matter density in language-processing regions, potentially enhancing responsiveness to music-based approaches. Additionally, stronger emotional engagement with music (Duckworth & Seligman, 2006; Matthews et al., 2009) may have contributed to their superior performance.

Conversely, the lack of a significant effect in male participants may be attributed to differences in cognitive processing strategies and musical preferences. Research suggests that boys rely more on procedural memory and exhibit greater left-hemisphere dominance for verbal functions (Hartshorne & Ullman, 2006; Ruigrok et al., 2014), which may reduce the effectiveness of MWU learning. Studies by Finnäs (1989) and Dobrota & Reić Ercegovac (2009) indicate that rhythm-based instruction may be more effective for male learners, suggesting that alternative approaches such as rhythmic recitation or movement-based learning could enhance their engagement and MWU learning.

Interestingly, participants' productive MWU knowledge scores surpassed their receptive scores at both T0 and T1. This finding challenges the widely accepted assumption in second language acquisition that receptive knowledge typically precedes and exceeds productive knowledge (Laufer, 1998; Nation, 2013b). Several interrelated factors may account for this unexpected outcome. First, the nature of the intervention—specifically, vocal training through singing—places strong emphasis on productive language use. Singing inherently involves active processes such as pronunciation, articulation, and real-time retrieval of MWUs, which likely facilitated deeper encoding and more robust memory traces than passive exposure alone (Ludke et al., 2014; Salcedo, 2010). The repeated vocal rehearsal of MWUs may have enhanced proceduralization, leading to more fluent and automatic retrieval in productive tasks. Second, the phenomenon of INMI, as described by Murphey (1990b), may have further supported productive MWU retention beyond the classroom setting. INMI functions as a form of spontaneous mental rehearsal, reinforcing previously learned sequences. This aligns with Wallace's (1994) chunking hypothesis, which posits that music helps segment language into manageable units, facilitating automatic production. Third, musical phrasing and rhythmic structures—key features of sung input—have been shown to promote fluency and accelerate retrieval speed (Thaut et al., 2005; Tegge, 2015). These musical scaffolds may have provided learners with rhythmic and prosodic cues that strengthened their ability to reproduce MWUs even before they had developed full receptive mastery. Moreover, the apparent discrepancy may reflect the greater cognitive demands placed on receptive vocabulary tasks. While productive tasks often rely on recall of rehearsed and familiar sequences, receptive tasks typically require recognition in varied and unfamiliar contexts, which demands greater cognitive flexibility (Webb & Nation, 2017; Laufer & Goldstein, 2004). Learners may therefore perform better on productive tasks not because they lack receptive knowledge, but because receptive assessments impose higher processing requirements. Finally, the dual encoding of lyrics and melody likely enhanced the salience of auditory memory traces. According to Gordon et al. (2010) and Sammler et al. (2010), the integration of melody with verbal content strengthens phonological representations and supports syntactic patterning. Given that spoken language is inherently rhythmic, repeated singing may have facilitated the internalization of prosodic and grammatical structures, thereby favoring productive over receptive retrieval. Taken together, these findings suggest that the musicbased approach—particularly vocal training—may shift the conventional trajectory of L2 vocabulary learning, offering learners a productive advantage in MWU retrieval even before receptive competence is fully established.

Summing up, the significant ANCOVA interaction between gender and intervention type suggests that music-based vocabulary learning may be influenced by cognitive and emotional engagement levels (Ullman, 2004; Gur et al., 1999). However, the study's small sample size ($N = 21$) limits the generalizability of these findings. Furthermore, violations of ANCOVA assumptions, including heteroscedasticity and non-homogeneous regression slopes, highlight the need for more robust statistical techniques or non-parametric approaches in future research (Tabachnick & Fidell, 2019).

Additionally, the study's findings support previous concerns regarding cognitive overload in music-based learning (Webb & Nation, 2017; Medina, 2002). While melodic structure can enhance retention, it may also act as a distractor depending on learners' cognitive demands and capacities (Calvert & Billingsley, 1998; Racette & Peretz, 2007). To minimize cognitive load while maximizing learning outcomes, future studies should consider gradual exposure to music-based input and explicit vocabulary instruction to support comprehension and retention.

The findings of the first study confirm that a music-based approach effectively enhances MWU learning, particularly through chunking mechanisms, rhythmic reinforcement, and emotional engagement. However, the study also highlights key pedagogical and cognitive limitations, including cognitive overload, individual learner differences, and gender disparities in responsiveness to musical interventions. Methodological challenges such as small sample size and ANCOVA assumption violations underscore the need for larger-scale studies with refined statistical techniques. Future research should explore long-term MWUs retention and investigate adaptive instructional strategies that accommodate diverse cognitive profiles, ensuring maximum pedagogical effectiveness for music-based vocabulary interventions.

4.4 Addition Insights from the First Study

The dataset presented below, derived from pre- and post-intervention questionnaires, offers important contextual insights that inform and refine the design of the second study. While the primary aim of the first study was to explore the effectiveness of the music-based approach, the supplementary data provide a deeper understanding of participants' self-perceptions, emotional engagement, and learner's attitudes toward the music-based approach. Affective and metacognitive dimensions—such as comfort with vocal training, occurrences of INMI, and beliefs about music's cognitive benefits—are often underrepresented in research, despite their potential impact on vocabulary learning outcomes. Integrating these insights strengthens the ecologi-

cal validity of the research and contributes to a more comprehensive, learner-centered framework for the subsequent study phase.

4.4.1 Self-Perception of the Pupils during the Intervention

In evaluating participants' self-perceptions during the intervention, a varied spectrum of well-being levels emerged, providing nuanced insights into the reception of the music-based approach. A distinct pattern emerged, categorizing participants into three groups based on their self-reported levels of comfort.

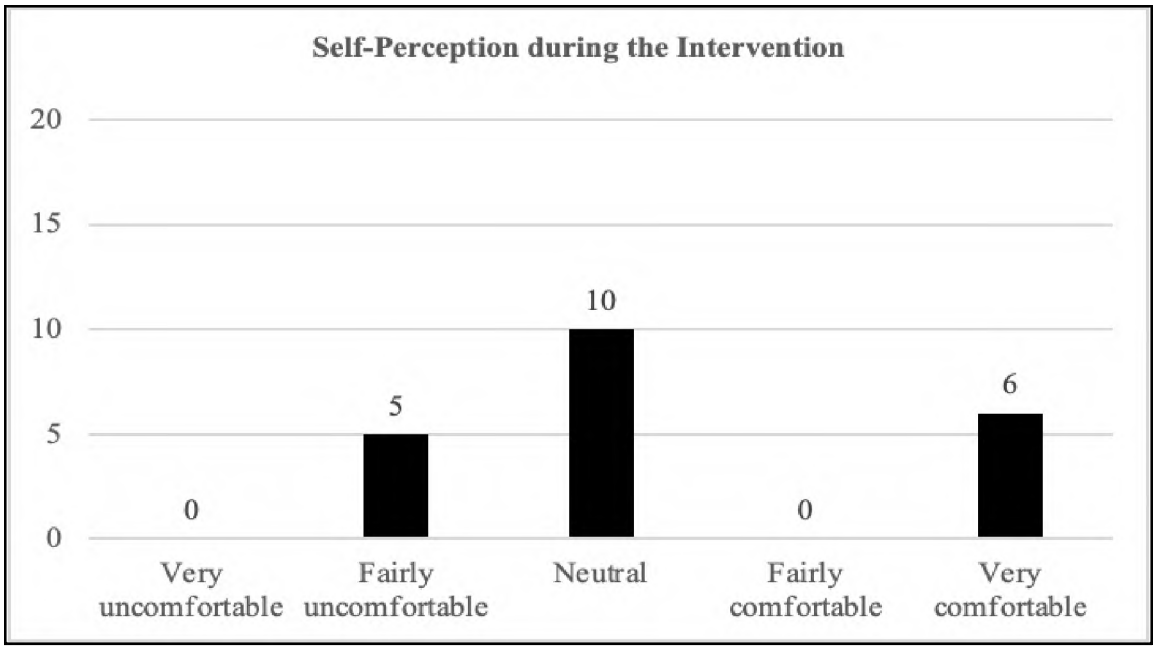
Firstly, a subset of participants, including DALM1018, SONN1118, LUNE1118, AYMS1218, EMTE1218, and YAIR1218 (6 pupils- 28,5%) consistently reported feeling "very comfortable" during the intervention. This positive and confident attitude towards vocal training with pop songs for MWU learning in the context of EFL suggests a favorable response to the intervention.

Secondly, another subgroup, comprising CATI1118, KAVE1218, JAYE1218, MERG1118, NISS1218, ANLM1118, MAIß1218, DUME1118, DASI1018, and MAOR1018 (10 pupils- 47,6%) expressed a "neutral" self-perception. This indicates a balanced or ambivalent stance among participants, signifying a lack of strong discomfort or pronounced comfort with the intervention.

Finally, a third category includes participants like TONT1218, TINZ1118, DALL1018, JAMO1218, and MIGE1118 (5 pupils- 23,8%) who consistently reported feeling "fairly uncomfortable." This suggests a moderate level of discomfort or unease during the intervention, implying potential challenges or reservations associated with the music-based approach.

Overall, the participants' self-perceptions reveal a predominantly neutral to positive reception of the intervention, with 76.1% of the pupils reporting either "very comfortable" or "neutral" experiences. From these findings, we can conclude that while the music-based approach resonates well with a significant portion of the participants (5 pupils- 23,8 %), a noteworthy minority experienced challenges or discomfort, highlighting areas for refinement and adaptation of the intervention.

Figure 7. *Learner Self-Perception during the Music-Based Intervention*



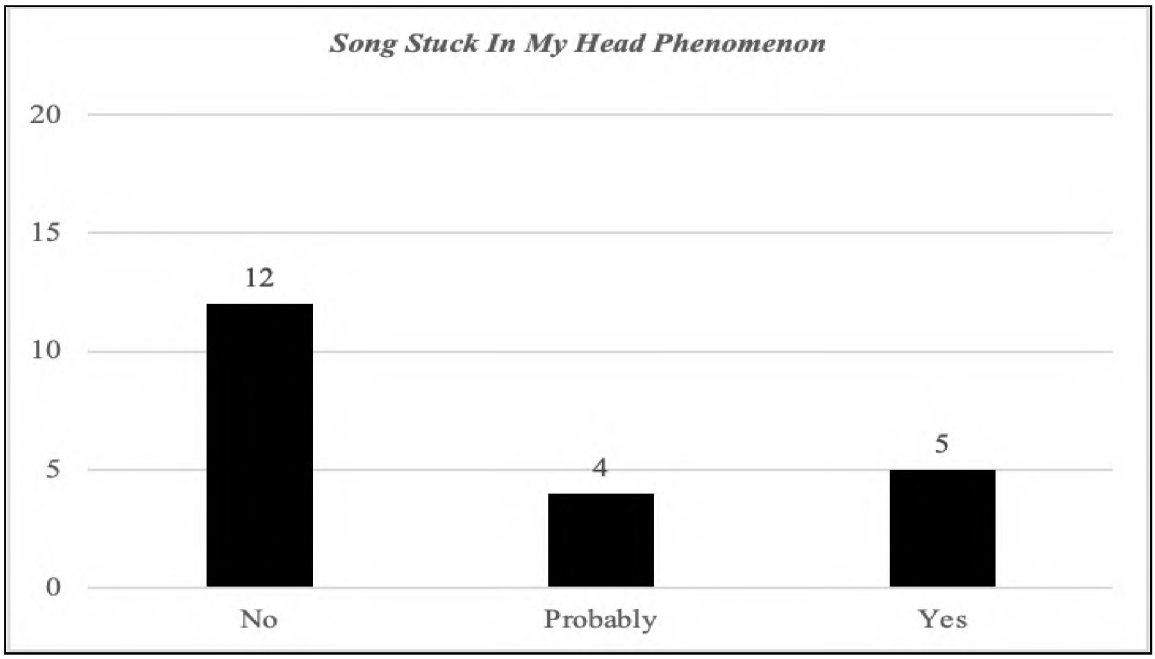
4.4.2 Involuntary Musical Imagery

The data concerning the Involuntary Musical Imagery (INMI)—referred to as SSIMHP in the questionnaire to make it more accessible for pupils—collected from participants in the first study, sheds light on pupil's experiences of INMI. Each participant was queried in the post-test questionnaire to determine whether they had experienced this phenomenon at least one time during the intervention.

A diverse range of responses was observed among the participants regarding the INMI: DALM1018, SONN1118, JAYE1218, TONT1218, and YAIR1218 (5 pupils- 23,8%) reported experiencing the phenomenon. TINZ1118, CATI1118, KAVE1218, JAMO1218, AYMS1218, MIGE1118, LUNE1118, MERG1118, NISS1218, ANLM1118, MAOR1018, and DUME1118 (12 pupils- 57,1%) responded to have not experienced this phenomenon in the time of the intervention. DALL1018, DASI1018, EMTE1218, and MAIß1218 (4 pupils- 19%) expressed uncertainty with responding "probably." Additionally, four participants did not provide answers, likely due to the ambiguous phrasing of the question. Recognizing this limitation, the question was revised for clarity in the second study.

Although this exploratory analysis highlights that some participants experienced INMI, the ambiguous question limits the ability to draw definitive conclusions or make informed speculations regarding research question 3 in the second study.

Figure 8. *Song Stuck in My Head Phenomenon (INMI) Frequency Post-Intervention*



4.4.3 Perceived Music Benefits Pre- and Post-Intervention

The analysis of pre- and post-intervention data on perceived music benefits provides insight into how pupils' attitudes toward music's cognitive impact evolved over the study period. Before the intervention, responses reflected a broad range of perceptions, with a significant proportion (33.3%, or 7 pupils) selecting "no clue," indicating uncertainty about music's role in memory and concentration. However, nearly one-fourth of the pupils (23.8%) already perceived music as beneficial ("most likely"), suggesting that some pupils entered the study with pre-existing positive attitudes.

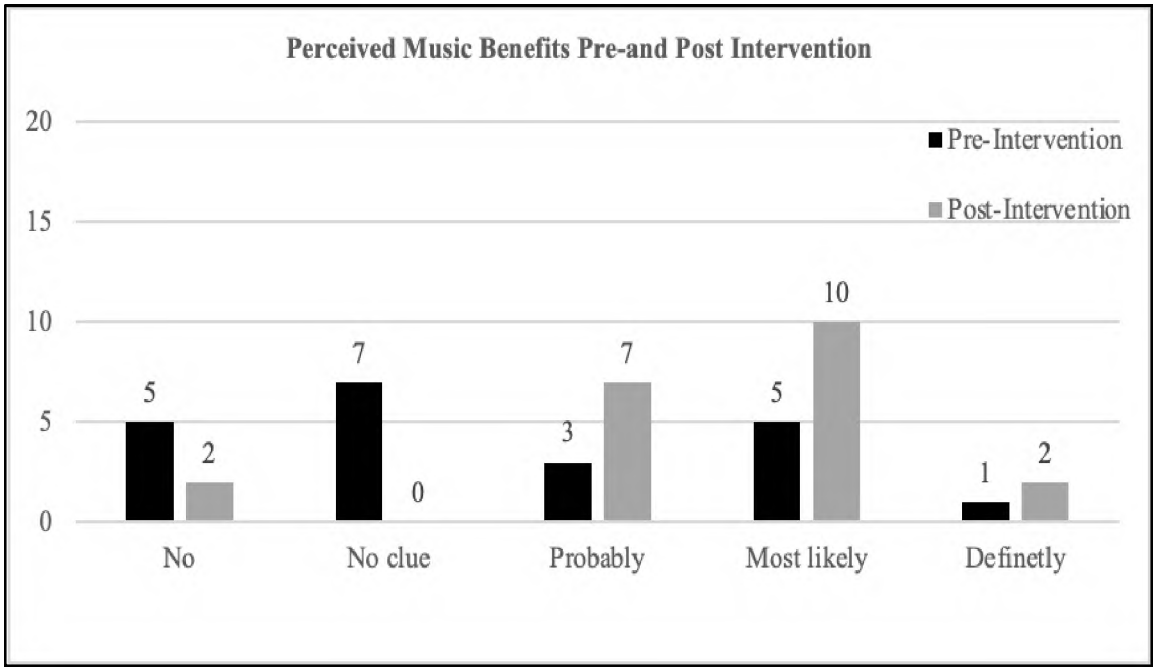
After the intervention, a positive shift in perception was observed, with 47.6% (10 pupils) expressing a more favorable stance. Notably, pupils who initially had no opinion ("no clue") demonstrated the greatest shift toward a positive view, with 23.8% (5 pupils) upgrading their response to "probably," and 4.7% (1 pupil) moving to "most likely." This suggests that direct engagement with music may have clarified its perceived benefits for some pupils, reinforcing the idea that active exposure to music can influence attitudes toward its cognitive impact.

However, not all shifts were positive. While the majority maintained or improved their perceptions, two pupils (9.4%) exhibited less favorable changes—one shifting from "probably" to "no," and another from "no clue" to "no." This could indicate that personal experiences during the intervention varied, with some pupils potentially finding the music-based approach ineffective or experiencing challenges engaging with the vocal training. Such variation highlights the importance of indi-

vidual learning differences and suggests that while music-based approaches may generally support positive perception shifts, they may not resonate with all learners equally.

Overall, the increase in positive or neutral perceptions from 61.9% pre-intervention to 71.4% post-intervention (a 9.5% gain) suggests that a music-based vocabulary learning approach may positively influence pupils' perceptions of its cognitive benefits. However, given the small sample size and the ambiguities in questionnaire design, these findings should be interpreted with caution. Ensuring greater clarity and reliability in measuring pupils' perceptions will require a refinement of data collection tools in the second study, allowing for more precise assessment of the intervention's impact.

Figure 9. *Perceived Benefits of Music: Pre- and Post-Intervention Comparison*



4.4.4 Student Learning Perception

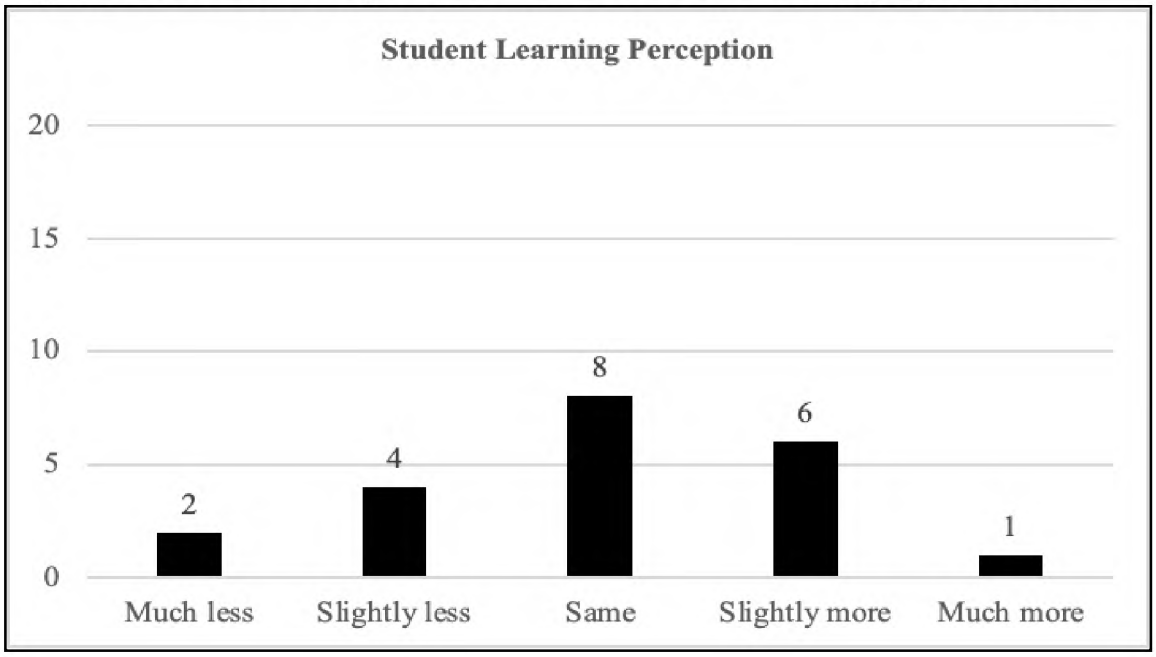
The analysis of first study data on pupils' perceptions of learning English MWUs through vocal training with pop songs provides valuable insights into the perceived efficacy of this approach, specifically for acquiring and retaining MWUs. Pupils were asked to compare their learning experiences using music to previous English classes, with responses ranging from "much less" to "much more."

A notable portion of participants, 18.5% (6 pupils), reported learning "slightly more" with music, suggesting a generally positive perception of its integration into language learning. Meanwhile, 38.1% (8 pupils) perceived no difference, selecting

"same," indicating that for these pupils, music neither enhanced nor hindered their learning outcomes. On the less favorable side, 19% (4 pupils) indicated learning "slightly less," and 9.5% (2 pupils) selected "much less," suggesting a preference for traditional, non-music-based approaches. Only 4.7% (1 pupil) expressed a strongly positive view, believing they learned "much more" with music.

Overall, 61.9% (13 pupils) reported neutral or positive perceptions of learning with music-based approach, compared to 28.5% (6 pupils) who viewed it less favorably. These findings indicate the potential of music-based interventions to enhance MWU learning for some pupils. However, the diversity of responses highlights the influence of individual factors, such as learning styles, musical preferences, and prior experiences on pupils' perceptions. This variation makes it difficult to establish clear expectations for the second study, as perceptions range from positive to neutral and even negative.

Figure 10. *Student Perceptions of Multi-Word Unit Learning Effectiveness*



4.5 First Study: Limitations, Qualitative Insights, Documentation, and Self-Reflection

The first study revealed several limitations, with time constraints emerging as the most significant. A majority of pupils, excluding a few high performers, struggled to complete the tasks within the designated 10-minute timeframe per task, primarily due to the extensive number of MWUs. Only 3-4 pupils with higher prior English

MWUs knowledge managed to complete the tasks efficiently, while the others required additional time exceeding the allotted 10 minutes. Many pupils also expressed feeling overwhelmed by the workload.

Similarly, the time allocated for the presentation phase was identified as a further limitation, as 10 minutes proved insufficient to effectively present 10 MWUs. Qualitative data, including diary entries (student comments and self-made notes), indicated that introducing 10 MWUs per lesson during the first study exceeded the pupils' cognitive capacity. Based on these observations, the second study was designed to reduce the number of MWUs to five per lesson. Additionally, each MWU will be repeated no fewer than 6 times in the pop songs and will consist of no more than 4 lexical items. This adjustment aligns with the principles of Cognitive Load Theory. As Plass et al. (2012) assert, intrinsic cognitive load is influenced by the number of elements processed in working memory during a learning task and by the learner's prior knowledge. Similarly, Sweller (1993) emphasizes that excessive cognitive load—comprising both intrinsic and extraneous elements—can hinder learning and problem-solving. To ensure the intervention's effectiveness, the reduction of extraneous load caused by the original instructional design was essential (Plass et al. 2012).

An interesting phenomenon observed during the first study was the pupils' difficulty in singing the verses of certain songs, contrasted with their consistent engagement with the refrains/choruses and pre-choruses. This issue was particularly evident with songs like *Where Is The Love?* by Black Eyed Peas and *Right Round* by Flo Rida feat. Kesha, both of which have faster tempos compared to slower songs such as *This Is Me* by Demi Lovato or *Feel* by Robbie Williams. Specifically, verses posed a challenge unless they were repeated verbatim throughout the song. This finding, combined with the musical emphasis placed on refrains in pop music, led to the strategic decision to focus exclusively on MWUs within the refrains during the main intervention.

The first study revealed that the introduction of new task formats-fill-in-the-gap and writing tasks—unexpectedly increased pupils' cognitive load. In addition to learning new MWUs, pupils had to simultaneously familiarize themselves with these tasks and apply their newly acquired knowledge. Unlike guided writing tasks typically used in classroom settings, these formats lacked essential scaffolding, such as visual aids, sentence starters, or structured prompts. To address this limitation, the second study was planned to include a pre-assessment of pupils' familiarity with the task formats prior to the intervention. If pupils are unfamiliar with these formats, a 45-minute lesson will be allocated to introduce and familiarize them with the tasks. Additionally, if significant gaps were identified, an instructional session was planned

to be conducted beforehand, in collaboration with colleagues, to further clarify the task structure. These measures ensure procedural fairness, maintain adherence to the lesson plan schedule, and mitigate potential negative impacts on study results. This approach aligns with Cognitive Load Theory, which highlights the importance of minimizing extraneous cognitive load to optimize learning efficiency (Cooper & Sweller, 1987; Plass et al., 2012). Furthermore, to provide additional support, appropriate scaffolding was incorporated through a *Help Card*, which includes sentence starters, structured prompts, and visual aids (Appendix K).

Furthermore, the initial double lesson in the first study posed significant time-management challenges. Within a tight two-hour timeframe, several activities had to be completed: introducing the intervention, assigning pseudonymized student codes, administering a demographic test, conducting the T0 assessment, assigning songs, and forming expert groups. Additionally, pupils received materials, including worksheets and presentation cards, along with two demonstrated presentation examples. The compressed schedule required meticulous planning. During the main intervention, the researcher closely monitored the time allocated for preparatory activities and, when necessary, extended the session by an additional hour. In some cases, preparatory activities were conducted in advance by the researcher or class coordinators to ensure a smoother and more productive start.

Despite the researcher's prior experience teaching sixth-grade pupils, the language materials crafted for the first study presented unexpected challenges. Pupils struggled with the extensive vocabulary embedded in the worksheets and tasks, which went beyond the targeted MWUs. Consequently, the textual content of tasks was simplified, and German translations of challenging vocabulary were added as explanatory notes at the bottom of each page. These adjustments aimed to enhance comprehension and reduce extraneous cognitive load, fostering a more effective engagement with the instructional content.

Moreover, an intriguing insight emerged when a student in the first study expressed strong dislike for the song *This Is Me* by Demi Lovato, stating that he found "everything" about it disagreeable. This feedback suggested a potential barrier to learning, as pupils who dislike the selected songs or the pop genre in general may develop a mental state counterproductive to learning. To address this, a question on music preferences was added to the pre-intervention questionnaires for the second study. The data were analyzed to explore the extent to which pop music facilitates relaxation and supports MWU learning through involuntary repetition of lyrics, as well as the role of pupils' music preferences in this process. Ensuring that pupils have a favorable disposition toward the selected songs may be critical in achieving the intended learning outcomes and could serve as a predictor of vocabulary learning.

The first study highlighted several key areas for improvement, including time management, task design, material complexity, and the role of music preferences. These insights have informed strategic adjustments to the study design, ensuring a more structured and effective approach for the main intervention. By addressing these limitations and adhering to cognitive learning principles, the study aims to optimize both the learning experience and research outcomes in the second study.

4.5.1 Limitations of the Lesson Planning

During the intervention, learners faced challenges in relaxing during the warm-up phase. To address this, it was suggested that they close their eyes while listening to the music, which helped them focus solely on the auditory experience. This technique alleviated self-consciousness and eliminated feelings of inadequacy associated with being observed by others or not fully "experiencing or enjoying" the song.

In response to the "natural, unpredicted, and unexpected" bodily activation observed in the test group during the warm-up and activation phases of the first study, it was decided that, in the second study, pupils would be instructed to remain seated while singing (test group) or reciting (control group). This modification ensured that the study's results can be directly linked to the music-based approach, rather than a combination of music-based approach and body activation.

Additionally, pupils felt more comfortable reading the running lyrics of the songs on YouTube compared to static printed or digital versions. Using YouTube videos with running lyrics for the test group ensured that pupils could easily follow the lyrics as they were meant to be sung. However, a limitation emerged in this context, as the MWUs to be learned could not be underlined in the running lyrics on the YouTube video. Despite this, it was deemed preferable to have the class remain oriented with the lyrics and clearly understand what to sing, rather than risk confusion during the singing activity. To mitigate this issue, deliberate attention to the MWUs was planned to be provided just before the singing activities in the presentation phase. Pupils had already completed a worksheet of the target MWUs, which remained on their desks during the singing activity to reinforce their focus on the specific MWUs.

Another key observation from the first study was that certain pupils, despite their general enjoyment of singing, felt uneasy doing so in the classroom setting. This discomfort may have stemmed from an inadequate class atmosphere or the pupils lack of prior experience singing in such a context. In response, a proactive strategy was incorporated into the main intervention. Teachers were encouraged to engage pupils in singing two to three songs before the intervention to help alleviate any

discomfort and improve the classroom atmosphere, ensuring a more positive environment during the intervention.

Finally, during the consolidation phase, the answers to the first task (fill-in-the-gap) were displayed on the board, allowing pupils a few minutes to compare their responses and ask for clarification as needed. Regarding the second task, at least two texts per class were read aloud and discussed collectively to further reinforce learning and understanding.

4.5.2 Implications Following the First Study

The following key changes were implemented following the first study:

- Linguistic Revision: Tasks 1 and 2 were revised, with the addition of notes including German translations for words that may be unfamiliar to pupils, particularly those above the A2 level of English according to the CEFR.

- Selection of Multi-Word Units: Multi-word units were selected exclusively from the refrain of the pop songs.

- Time Allocation: The tasks (writing and fill-in-the-gap) were introduced to the pupils at least once before the intervention, particularly if they are unfamiliar to the learners.

- Reduction in MWUs: The number of MWUs per lesson was reduced from 10 to 5. Furthermore, each MWU was planned to be repeated a minimum of six times, and each MWU did not contain more than four lexical items.

- Musical Preference Question: A question regarding pupils' musical preferences was added to the pre-intervention questionnaire.

4.6 Summary and Conclusion

The first study, conducted at Rupert Neudeck Gesamtschule from October 16 to October 27, 2023, investigated the impact of a music-based intervention on the receptive and productive knowledge of MWUs among lower secondary EFL learners. The intervention was implemented across eight classes, following the structured lesson plan outlined in Chapter 3. Originally involving 28 pupils, the final analysis included only 21 participants, as seven were excluded due to their absence from one or more intervention sessions. A mixed-method approach integrating quantitative statistical

analyses, including *t*-tests, ANCOVA, and effect size estimation, with qualitative self-reflection and participant feedback, provided a comprehensive evaluation of the intervention's effectiveness.

The statistical analysis of pre-test (T0) and post-test (T1) data confirmed a significant improvement in MWU learning following the intervention. A paired *t*-test indicated a substantial mean score increase ($\Delta T = 13.69$, $t(20) = 3.91$, $p = 0.006$), with an effect size of Cohen's $d \approx 0.5$, suggesting a moderate impact on MWU learning. Given that effect sizes above 0.4 are considered pedagogically relevant in education, the findings highlight the intervention's meaningful contribution to MWU learning and warrant further exploration in the second study. The effect size of the first study also serves as an empirical reference for estimating the anticipated effect size in the second study. With the moderate effect size observed, a larger sample size of approximately 200 participants was required to enhance statistical power and reduce standard error in effect size estimation. Power analysis confirmed that to achieve a statistical power of 0.8, a minimum sample of 34 participants is required for paired *t*-tests, while an ANOVA incorporating the study's five main variables as between-subject factors necessitates a sample size of 120 participants.

Beyond statistical significance, the study provided theoretical insights into the mechanisms underlying music-based MWU learning. The observed MWUs gains align with Wallace's chunking hypothesis, which suggests that musical structuring enhances linguistic recall. The study's findings also resonate with prior research on melody-enhanced vocabulary retention, indicating that rhythm and repetition support the acquisition of MWUs. Analyzing the intervention's impact further, gender-based differences emerged, with female participants outperforming their male counterparts. This result corresponds with neurocognitive research highlighting declarative memory advantages in women, suggesting that stronger reliance on this memory system may facilitate word learning through song lyrics.

The study also revealed an unexpected trend in the relationship between receptive and productive knowledge. Contrary to conventional assumptions that receptive knowledge precedes productive knowledge, participants in this study demonstrated stronger productive MWUs gains at both T0 and T1. This finding suggests that active vocalization during singing may reinforce pronunciation, articulation, and memorization more effectively than passive recognition, thereby enhancing productive MWUs knowledge.

Despite these promising findings, several methodological and pedagogical limitations emerged, prompting adjustments for the second study. The number of MWUs per lesson was reduced from ten to five to ensure that cognitive demands remained manageable. Each MWU will be repeated a minimum of six times within

the pop songs, and lexical items will be restricted to a maximum of four per MWU to avoid cognitive overload. The complexity of instructional materials also presented challenges, as pupils struggled with extensive vocabulary beyond the targeted MWUs. To address this, linguistic adjustments were made, including German translations for complex vocabulary, structured prompts, and "Help Cards" containing additional scaffolding to support comprehension. Furthermore, the unfamiliarity of the fill-in-the-gap and writing tasks increased extraneous cognitive load, necessitating a pre-intervention familiarization session to introduce these tasks in the second study. The refinement of data collection tools was another key revision, particularly the revision of the post-test questionnaire, ensuring that questions on INMI are clearer and more precise to improve data reliability.

Additional modifications were made to optimize the intervention's execution. Some pupils showed reluctance toward specific song choices, which negatively affected their engagement. To address this, the pre-intervention questionnaire included a question on general musical preferences, as well as a follow-up question on participants' liking of the specific pop songs used in the intervention. The limited time available for certain instructional phases also necessitated structural changes. Further observations indicated that pupils felt more comfortable reading running lyrics from YouTube videos rather than static materials. Accordingly, the second study was designed to integrate running lyrics in the test group for greater accessibility. Classroom comfort was another critical consideration, as some pupils experienced unease singing in the presence of their peers. To improve this, teachers will be encouraged to engage pupils in informal singing activities before the intervention.

The first study confirmed that a music-based approach can enhance MWU learning. While the intervention demonstrated a statistically meaningful impact, the methodological limitations identified underscore the necessity for strategic refinements in the second study. Several key improvements have been implemented, addressing issues related to cognitive load, instructional design, data collection accuracy, and lesson plan. These refinements provide a strong empirical foundation for the second study, ensuring that the intervention is both methodologically robust and pedagogically effective. Moving forward, the second study was intended to confirm the anticipated effect size using a larger, more statistically robust sample, refine statistical assumptions to enhance reliability, assess long-term MWU retention beyond the immediate post-test, and examine the influence of learner engagement and individual musical preferences on MWU learning. By addressing these refinements, the second study aims to provide a comprehensive and reliable evaluation of the effectiveness of music-based MWU learning approach, contributing to the broader discourse on integrative approaches in foreign language learning.

CHAPTER 5: SECOND STUDY

The second study systematically evaluated the impact of a music-based approach—combining vocal training with selected English pop songs— on the receptive and productive knowledge of English multi-word units (MWUs) among lower secondary English as Foreign Language (EFL) learners. Expanding on the first study, the second study introduced a control group to enable direct comparison with a non-music-based approach and additionally examined the roles of well-being and Involuntary Musical Imagery (INMI) in MWU learning.

The intervention was conducted across four secondary schools in North Rhine-Westphalia, Germany: Rupert Neudeck Gesamtschule (Feb 14-28, 2024), Leibniz-Gesamtschule Duisburg (Mar 4-22, 2024), Konrad-Duden Gymnasium (Feb 26-Mar 8, 2024), and Michael Ende-Gymnasium (Apr 15-29, 2024). Each school included both a test and a control group, totaling eight classes. The intervention lasted two weeks per school and adhered to the instructional framework detailed in Chapter 3.

To standardize implementation, all groups began with a two-hour preparatory session involving the pre-test (T0), pre-intervention questionnaire, pseudonym code generation, and assignment to expert groups with designated songs/ lyrics. Participants received instructional materials, including worksheets targeting MWUs, presentation guidelines, and example presentations—delivered both live and via video—to clarify expectations. A follow-up session after the intervention administered the post-test (T1) and post-questionnaire. Two weeks after T1 took place the delayed post-test (T2).

Of the 241 pupils initially considered, 29 were excluded due to missing consent or incomplete participation, resulting in a final sample of 212. This study addressed limitations from the previous design by refining instruments and expanding the participant pool to enhance validity and reliability.

Given the use of percentage-based outcome variables bounded between 0 and 100, logit transformation was applied to meet assumptions for inferential statistics. This step stabilized variance, addressed boundary effects, and enabled the use of multivariate analyses (Lee, 2020; Seiffert et al., 2024).

This chapter details the analytical procedures and results of the second study, beginning with the rationale for selecting multivariate analysis of covariance (MANCOVA) as the primary statistical method. MANCOVA was well-suited for handling multiple interrelated outcome variables while controlling for covariates and minimizing Type I error.

Subsequently, the chapter presents sample characteristics, including demographics, linguistic profiles, and group assignments. Descriptive statistics and cross-tabulations establish group comparability and identify potential covariates. Preliminary analyses follow, validating the assumptions of MANCOVA through transformed-variable normality checks and chi-square tests assessing baseline equivalence.

The main sections report inferential results addressing research questions 1-3. Each subsection corresponds to a research question and presents multivariate results, between-subject effects, planned contrasts, effect sizes, and estimated marginal means.

The chapter concludes with an integrative discussion synthesizing the results across all research questions, offering a comprehensive interpretation of the intervention's effects on MWU acquisition, well-being, and INMI.

5.1 Sample Characteristics

This section provides an overview of the study participants, focusing on their demographic backgrounds and group distributions. The study sample originally comprised 241 students from four public secondary schools (two grammar schools and two comprehensive secondary schools) in North Rhine-Westphalia, Germany. However, 29 students were excluded due to a lack of parental consent or absence during key sessions, resulting in a final sample of 212 participants.

The sample maintained a balanced distribution between the control (49.5%) and test (50.5%) groups, along with diverse representation in terms of age and gender. The majority of participants (95.3%) were 11 or 12 years old, with a smaller proportion aged 13 (3.3%) or 14 (1.4%). Gender distribution was also relatively even (53.8% female, 46.2% male), reducing the likelihood of systematic bias in group comparisons.

The following subsections provide a comprehensive analysis of key sample characteristics to verify the validity of group comparisons. Section 5.1.1 examines participants' linguistic backgrounds, detailing the distribution of monolingual and bilingual speakers as well as their first-language classifications. Section 5.1.2 presents cross-tabulation analyses assessing gender and bilingualism distributions across experimental conditions, ensuring no systematic group imbalances. Section 5.1.3 evaluates the continuous study variables, analyzing their distributional characteristics and adherence to statistical assumptions. These analyses are essential for identifying potential biases and confirming that any observed effects in the study can be attributed to the intervention rather than pre-existing differences between groups. Furthermore, deviations from normality in key vocabulary-related variables were as-

sessed to determine whether data transformation techniques, such as logit transformation, are necessary for ensuring the validity of subsequent inferential analyses.

5.1.1 Descriptive Statistics

A detailed overview of participants' linguistic backgrounds, age, gender, and group assignments is provided, as these variables are central to the study's statistical analyses. Describing these characteristics allows for the assessment of group comparability and the identification of any pre-existing differences that might influence the outcomes of the intervention.

Figures 11 and 12 display the distribution of monolingual and bilingual participants along with their first language (L1) profiles.

Figure 11. *Distribution of Monolingual and Bilingual Participants*

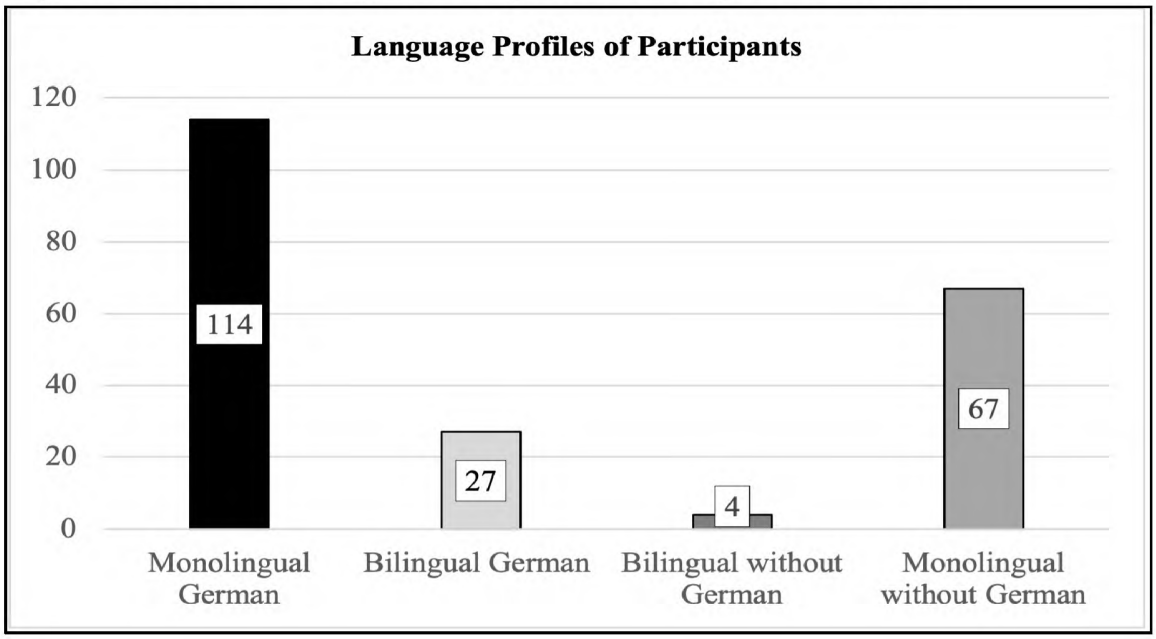
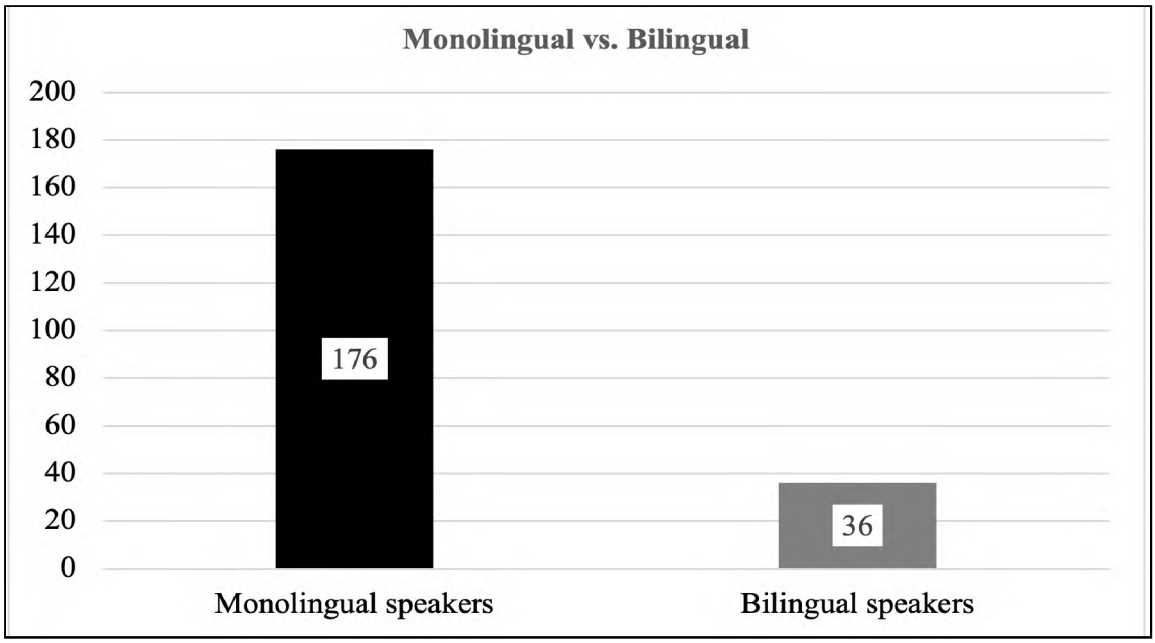


Figure 12. *First Language Profiles of StudyParticipants*



Given the presence of speakers from 62 distinct language backgrounds, participants were grouped into 15 macro-categories primarily based on the initial letter of their first language. This alphabetic classification was implemented to streamline analysis and visualization while maintaining a representative overview of the sample's linguistic diversity. The resulting categories enhance interpretability without compromising the descriptive integrity of the data. The resulting 15 macro-categories are as follows:

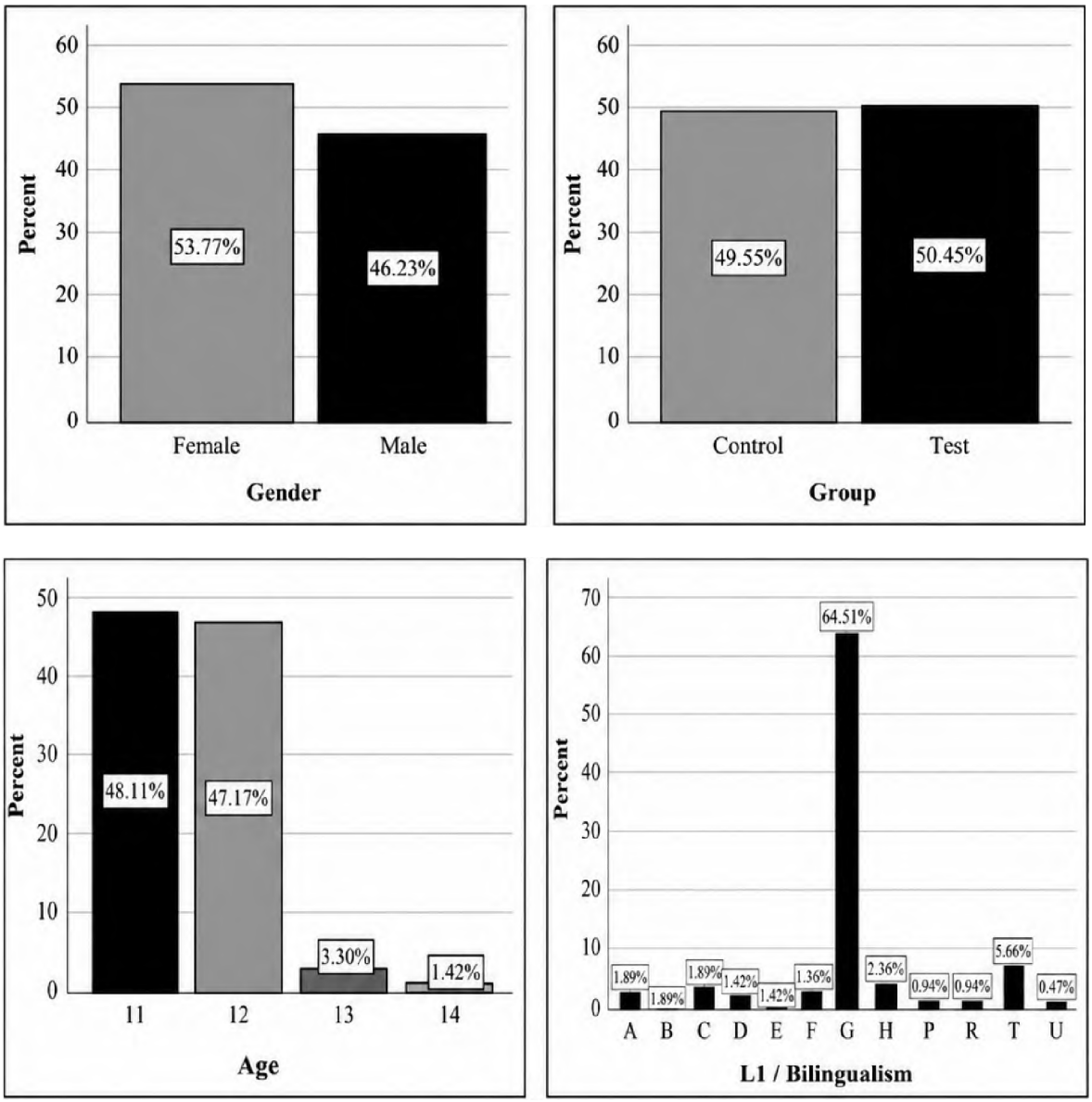
- Category A included nine participants: eight monolingual Arabic speakers and one monolingual Albanian speaker.
- Category B consisted of four participants: one monolingual Berber speaker and three Bulgarian speakers (two monolingual Bulgarian and one bilingual Bulgarian-Gypsy speaker).
- Category C included one monolingual Croatian speaker.
- Category D included one monolingual Dari speaker.
- Category E included one monolingual English speaker.
- Category F included one monolingual French speaker.
- Category G was the largest category, comprising 141 participants: 114 monolingual German speakers and 27 bilingual speakers. The bilingual subcategories included:
  - Two bilingual German-Italian speakers

  - Two bilingual German-Greek speakers
  - Four bilingual German-Russian speakers
  - Two bilingual German-Dutch speakers
  - Two bilingual German-Thai speakers
  - Two bilingual German-English speakers
  - One bilingual German-Albanian speaker
  - One bilingual German-Tamil speaker
  - Six bilingual German-Turkish speakers
  - Two bilingual German-Polish speakers
  - One bilingual German-Berber speaker
  - One bilingual German-Spanish speaker
  - One bilingual German-Afghan speaker
- Category I included two monolingual Iraqi speakers.
- Category K consisted of five Kurdish speakers: four monolingual and one bilingual (Kurdish-Sorani).
- Category L included one monolingual Lebanese speaker.
- Category M consisted of two monolingual Moroccan speakers.
- Category P included seven participants: five monolingual Polish speakers, one monolingual Persian speaker, and one monolingual Palestinian speaker.
- Category R comprised 12 Russian speakers: four monolingual and seven bilinguals (five bilingual German-Russian speakers and two bilingual Russian-Ukrainian speakers), along with one monolingual Romanian speaker.
- Category T included 24 monolingual Turkish speakers.
- Category U included one monolingual Ukrainian speaker.

The resulting 15 macro-categories include German (66.5%) as the dominant language, followed by Turkish (11.3%) and Russian (5.7%). Smaller linguistic groups (<5%) include speakers of Arabic, Albanian, Bulgarian, Kurdish, Persian, Polish, and other languages.

Figure 13 presents the distribution of *gender*, *L1/ bilingualism*, and *group assignment*, confirming the comparability of the control and test groups.

Figure 13. *Demographic Characteristics: Gender, Group Assignment, Language Background, and Age*



The age distribution is notably homogeneous, with the vast majority of participants (95.3%) being either 11 or 12 years old, and only a small proportion of 13 (3.3%) and 14-year-olds (1.4%). This concentration in the 11-12 age range indicates a fairly uniform age group for the study. Overall, these descriptive statistics paint a picture of a well-balanced sample in terms of gender and group assignment, featuring diverse linguistic backgrounds and a relatively narrow age range. The prevalence of one linguistic category and the concentration of ages between 11-12 years are important factors to consider when interpreting the study results and generalizing find-

ings to broader populations. The gender distribution shows a relatively balanced representation, with a slight majority of females (53.8%) compared to males (46.2%). The study design demonstrates an almost equal split between the control (49.5%) and test (50.5%) groups, which is ideal for comparing the effects of the intervention.

These descriptive statistics confirm an overall balance in group distributions, a prerequisite for ensuring that any observed effects in the study can be attributed to the intervention rather than pre-existing differences.

5.1.2 Cross-Tabulation Analysis

To verify whether key demographic and linguistic variables are evenly distributed across the control and test groups, cross-tabulations were conducted for gender and bilingualism. Ensuring balance in these variables minimizes the risk of confounding effects and strengthens the internal validity of the study.

5.1.2.1 Gender Distribution

To examine whether gender was equally represented in the control and test groups, a cross-tabulation was conducted. This step helps identify potential allocation biases that could influence the interpretation of group differences. The results are presented in Table 23.

Table 23. *Cross-Tabulation of Gender and Group*

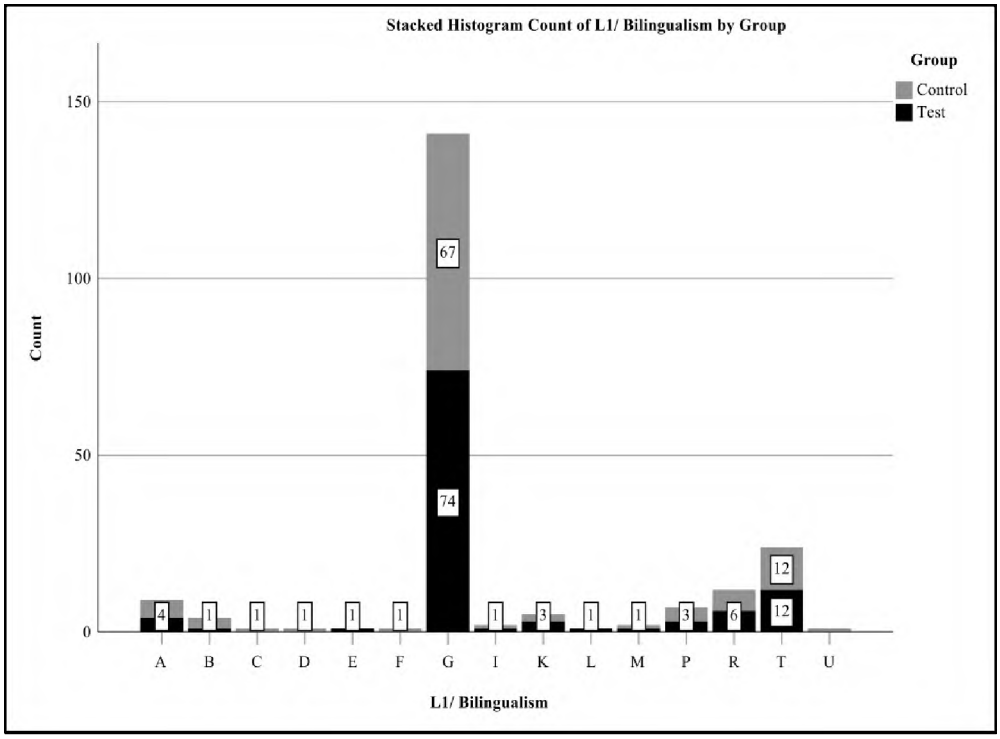
			Group		Total
			Control	Test	
Gender	f	Count	56	58	114
		% within gender	49,1 %	50,9 %	100,0 %
		% of total	26,4 %	27,4 %	53,8 %
	m	Count	49	49	98
		% within gender	50,0 %	50,0 %	100,0 %
		% of total	23,1 %	23,1 %	46,2 %
Total		Count	105	107	212
		% within gender	49,5 %	50,5 %	100,0 %
		% of total	49,5 %	50,5 %	100,0 %

Table 23 shows that females were nearly evenly split, with 49.1% in the control group and 50.9% in the test group. Male participants were equally distributed, with 50.0% in both groups. Overall, the total gender distribution was balanced, with 53.8% female and 46.2% male across the full sample ($N = 212$). These results indicate that gender was evenly distributed across conditions, suggesting it is unlikely to act as a confounding variable in the analysis of intervention effects.

5.1.2.2 Bilingualism Distribution

To examine whether bilingualism was evenly distributed between the control and test groups, a cross-tabulation analysis was performed. The results are displayed in Figure 14.

Figure 14. *First Language/Bilingualism Distribution Across Control and Test Groups*

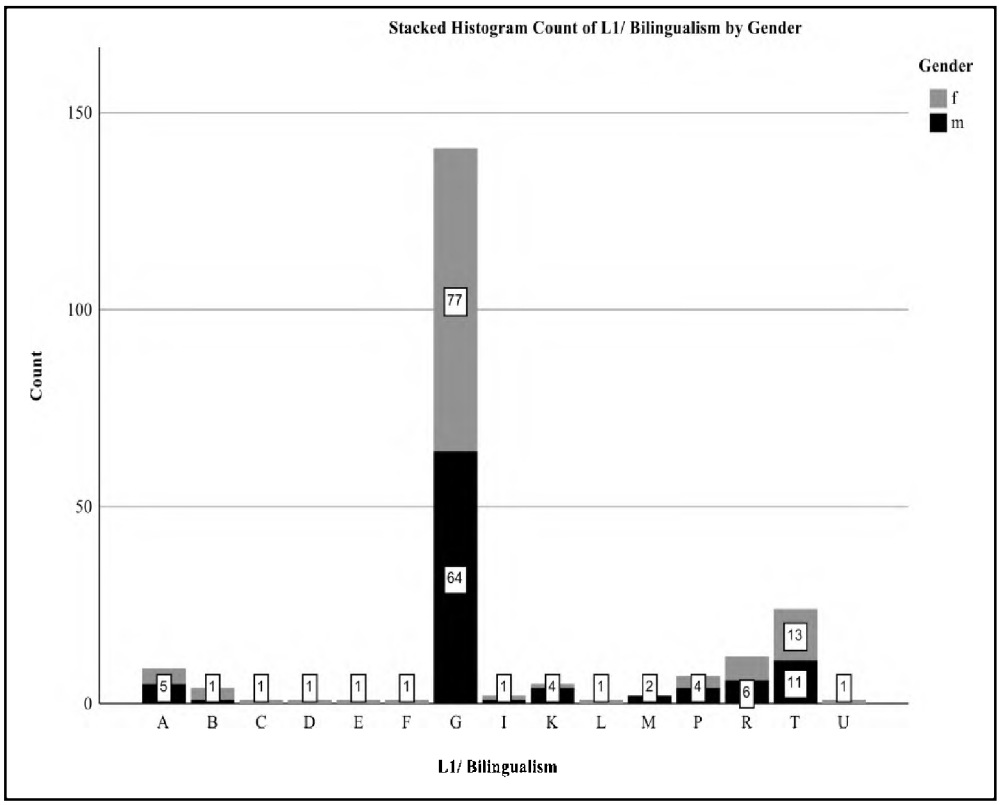


The largest linguistic category, German (66.5%), was distributed slightly more toward the test group (52.5%), but this difference remains negligible. Smaller linguistic categories were evenly spread, reducing concerns about potential biases.

5.1.2.3 First Language/Bilingualism Across Gender

To explore the relationship between bilingualism and gender, a cross-tabulation analysis was conducted. Figure 15 displays the distribution of L1/ bilingualism across gender groups.

Figure 15. *First Language/Bilingualism Distribution Across Gender Groups*



The largest linguistic category, G (German speakers), reflects the overall gender distribution, with 54.6% female and 45.4% male participants. The second-largest category, T (Turkish speakers, 11.3%), follows a similar pattern with 54.2% female and 45.8% male.

However, some smaller categories exhibit gender imbalances: Category K (Kurdish speakers, 5 participants) is predominantly male (80%). Categories B (Bulgarian and Berber speakers, 4 participants) and P (Polish, Persian, and Palestinian speakers, 7 participants) have more females (75% and 42.9%, respectively). Some categories (C, D, E, F, L, U) have only one participant each, all of whom are female. Conversely, category M (Moroccan speakers, 2 participants) is entirely male. Although minor variations exist—such as a higher proportion of male Kurdish speakers (80%) and female Bulgarian speakers (75%)—the overall distribution remains bal-

anced, ensuring that linguistic background does not introduce systematic bias into the study's outcomes.

5.1.3 Descriptive Statistics of the Continuous Variables

Descriptive statistics provide a summary of the distribution, central tendency, and variability of the study's continuous variables, offering essential insights into the dataset before conducting inferential analyses. This section presents an overview of the data's structure, including range, mean values, standard deviations, and distributional properties. Establishing these foundational statistical properties ensures a robust basis for subsequent analyses, while identifying skewness, kurtosis, or other deviations from normality that may necessitate data transformation to meet statistical assumptions.

Table 24 presents descriptive statistics for all continuous variables following logit transformation. The transformation was applied to address the bounded nature of percentage scores (0-100%) and to meet normality assumptions for parametric analyses. Receptive Knowledge (RK) refers to participants' ability to recognize and comprehend MWUs in context, measured through gap-filling tasks. Productive Knowledge (PK) refers to participants' ability to actively produce MWUs in writing tasks. These measures were collected at three time points: T0 (pre-test baseline), T1 (immediate post-test), and T2 (delayed post-test, two weeks after T1).

The logit transformation converted the original percentage scores using the formula: $\text{logit}(p) = \ln[p/(1-p)]$, where p represents the proportion of correct responses. This transformation resulted in values ranging from -9.21 to 9.21, with negative values indicating below-average performance and positive values indicating above-average performance relative to the logit scale midpoint. The purpose of Table 24 is to document these properties transparently, establish baseline equivalence between groups, identify variables requiring transformation for parametric analyses, and provide a comprehensive overview of all study variables before conducting inferential statistics.

Table 24. *Descriptive Statistics for Continuous Variables*

Descriptive Statistics										
	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. error	Statistic	Std. error

Descriptive Statistics										
T0 Receptive Knowledge	212	-9,21	-0,85	-2,767	2,795	7,812	-1,759	0,167	1,439	0,333
T0 Productive Knowledge	212	-9,21	1,45	-4,622	3,981	15,846	-0,229	0,167	-1,847	0,333
T1 Receptive Knowledge	212	-9,21	-0,85	-2,049	2,328	5,420	-2,579	0,167	5,285	0,333
T1 Productive Knowledge	212	-9,21	0,85	-1,696	2,971	8,825	-1,990	0,167	2,415	0,333
T2 Receptive Knowledge	212	-9,21	-0,85	-1,795	1,925	3,705	-3,238	0,167	9,88	0,333
T2 Productive Knowledge	212	-9,21	0,85	-2,042	3,271	10,699	-1,637	0,167	0,977	0,333
Exposure to English	212	-9,21	2,08	-2,663	2,236	4,997	-1,937	0,167	3,732	0,333
Exposure to pop songs	212	-9,21	9,21	-1,61	6,53	42,642	0,263	0,167	-1,006	0,333
Musical training	212	-9,21	9,21	-4,798	4,126	17,027	0,075	0,167	-1,285	0,333
Preference for pop music	212	-9,21	9,21	1,111	7,35	54,016	-0,245	0,167	-1,386	0,333
Exposure to English music	212	-9,21	9,21	3,464	5,607	31,438	-0,477	0,167	-0,55	0,333
Self-perceived song listening comprehension	212	-9,21	9,21	3,099	4,295	18,449	0,408	0,167	-0,624	0,333

Descriptive Statistics										
Perceived music benefits pre-intervention	212	-9,21	9,21	-0,205	6,068	36,822	-0,015	0,167	-0,697	0,333
Relaxed well-being state	212	-9,21	9,21	0,146	2,078	4,316	-1,379	0,167	10,822	0,333
SSIMHP (INMI)	212	-9,21	9,21	-2,664	6,272	39,332	0,440	0,167	-0,821	0,333
Selected pop song preference	212	-9,21	9,21	-0,84	5,421	29,384	0,004	0,167	-0,182	0,333
Self-perceived approach efficacy	212	-9,21	9,21	0,976	3,249	10,554	0,406	0,167	4,111	0,333
Willingness to adopt the approach	212	-9,21	9,21	-1,257	6,455	41,665	0,194	0,167	-0,962	0,333
Perceived music benefits post-intervention	212	-9,21	9,21	-4,913	5,747	33,025	0,977	0,167	-0,133	0,333
Valid *N* (listwise)	212									

Note. *SSIMHP = Spontaneous Song-Stuck-in-My-Head Phenomenon (INMI measure). All values represent logit-transformed scores ranging from -9.21 to 9.21, calculated using the formula: logit(p) = ln[p/(1-p)], where p represents the proportion of correct responses. These are continuous variables; categorical variables (gender, L1/bilingualism, school type, experimental condition) are presented separately in Tables 20-23. N = 212 participants.*

Across the dataset, mean values vary depending on the variable. Some measures lean toward higher positive averages, such as *self-perceived song listening comprehension* (*M* = 3.0991) and *exposure to English music* (*M* = 3.4644). Others, like *musical training* (*M* = -4.7985) and *perceived music benefits post-intervention* (*M* = -4.9129), exhibit negative tendencies. Standard deviation values reveal varying

degrees of dispersion, with *preference for pop music* (*SD* = 7.34956) and *exposure to pop songs* (*SD* = 6.53009) displaying the greatest variability, suggesting greater heterogeneity in responses. In contrast, *relaxed well-being state* (hereafter *well-being*) (*SD* = 2.07753) and *T2 receptive knowledge (RK)* (*SD* = 1.92497) indicate greater consistency, meaning participants' scores were more concentrated around the mean.

These visual diagnostics are essential rather than supplementary for three critical reasons. First, numerical skewness and kurtosis values alone cannot detect bimodality, ceiling/floor effects, or outlier patterns that would violate MANCOVA assumptions. For example, Figures 23-26 revealed bimodal distributions in music exposure variables that numerical statistics masked but which required careful covariate control. Second, each figure directly informed a methodological decision—Figures 16-21 justified the logit transformation by revealing severe negative skewness that would have invalidated parametric tests. Third, without visual inspection, critical patterns such as the ceiling effect in Figure 31 and the extreme kurtosis in Figure 28 would have remained undetected, potentially leading to incorrect statistical conclusions.

Table 25. *Diagnostic Purpose and Statistical Implications of Visual Analyses*

Figures	Variables Examined	Diagnostic Finding	Methodological Decision
16-21	T0-T2 RK and PK scores	Severe negative skewness (-3.24 to -1.76)	Logit transformation applied
22-23	English exposure measures	Bimodal distributions	Included as covariates in MANCOVA
24-27	Music preferences/training	Polarized responses	Tested as potential moderators
28	Well-being	Excessive kurtosis (10.82)	Robust standard errors used
29-34	INMI and self-perceptions	Near-normal distributions	No transformation needed

Figure 16. *Histogram with the Normal Curve: T0 Receptive Knowledge*

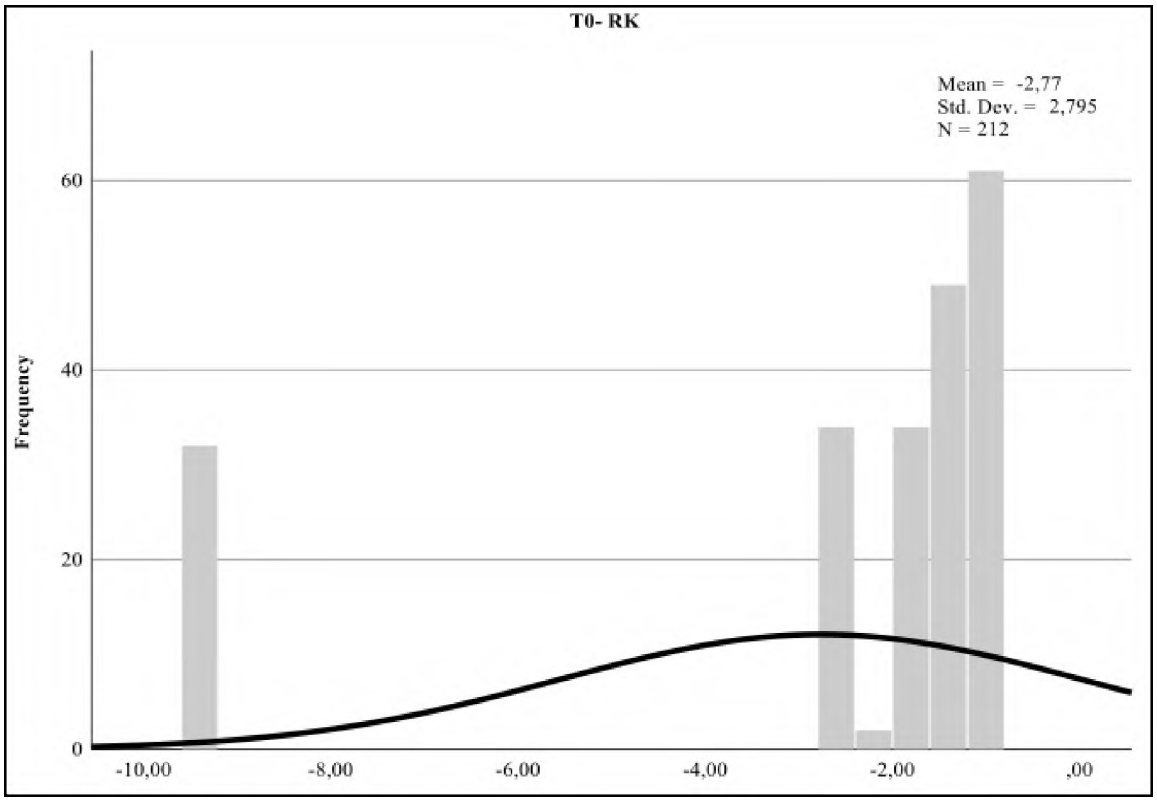


Figure 17. *Histogram with the Normal Curve: T0 Productive Knowledge*

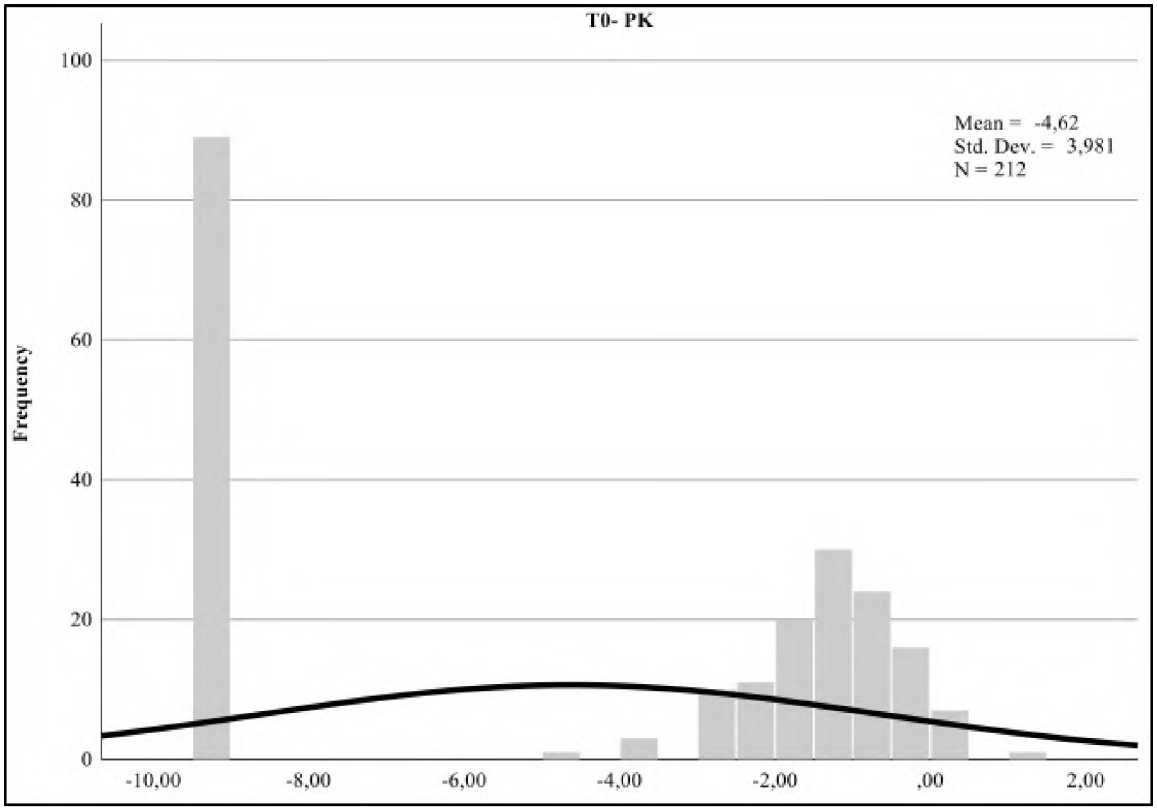


Figure 18. *Histogram with the Normal Curve: T1 Receptive Knowledge*

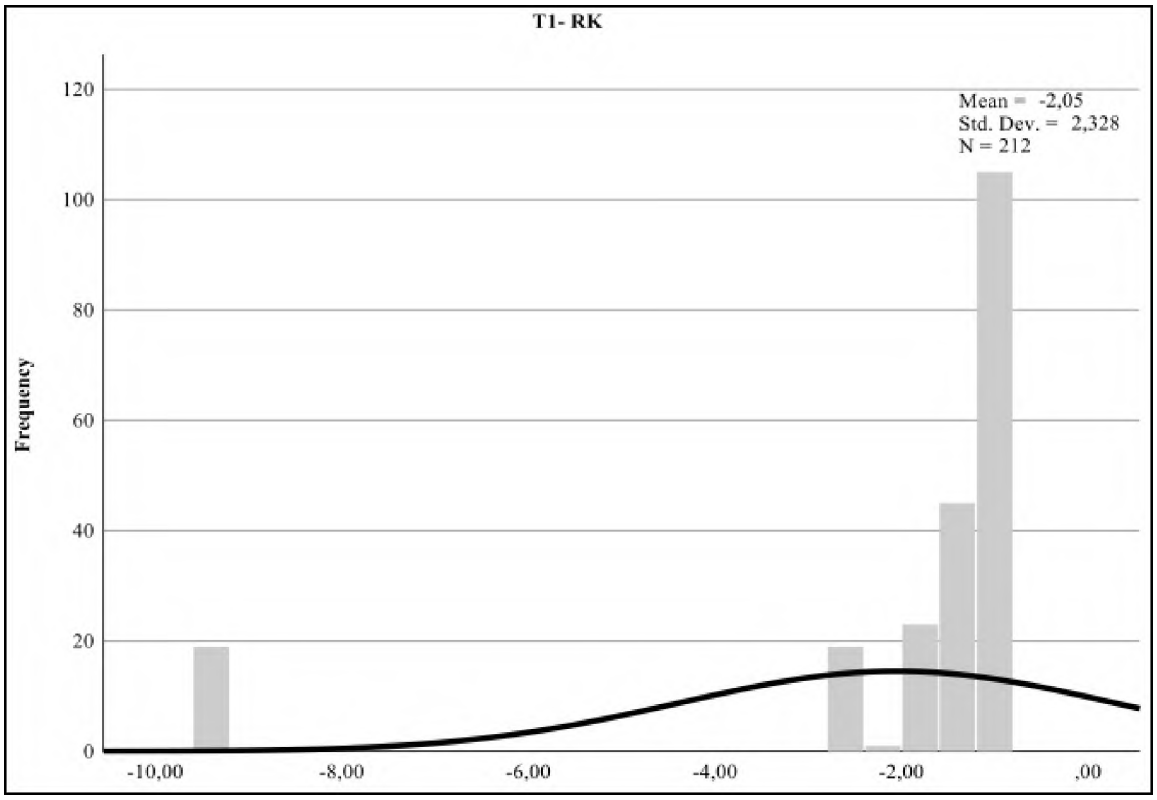


Figure 19. *Histogram with the Normal Curve: T1 Productive Knowledge*

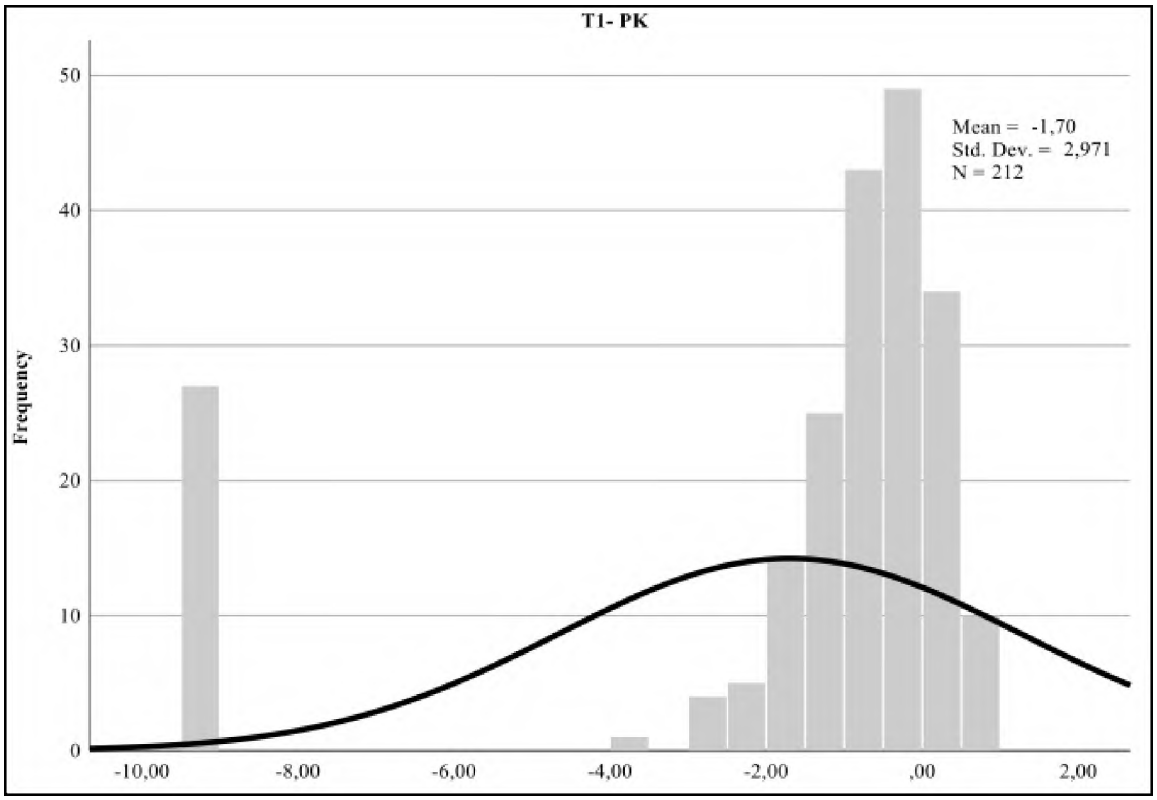


Figure 20. *Histogram with the Normal Curve: T2 Receptive Knowledge*

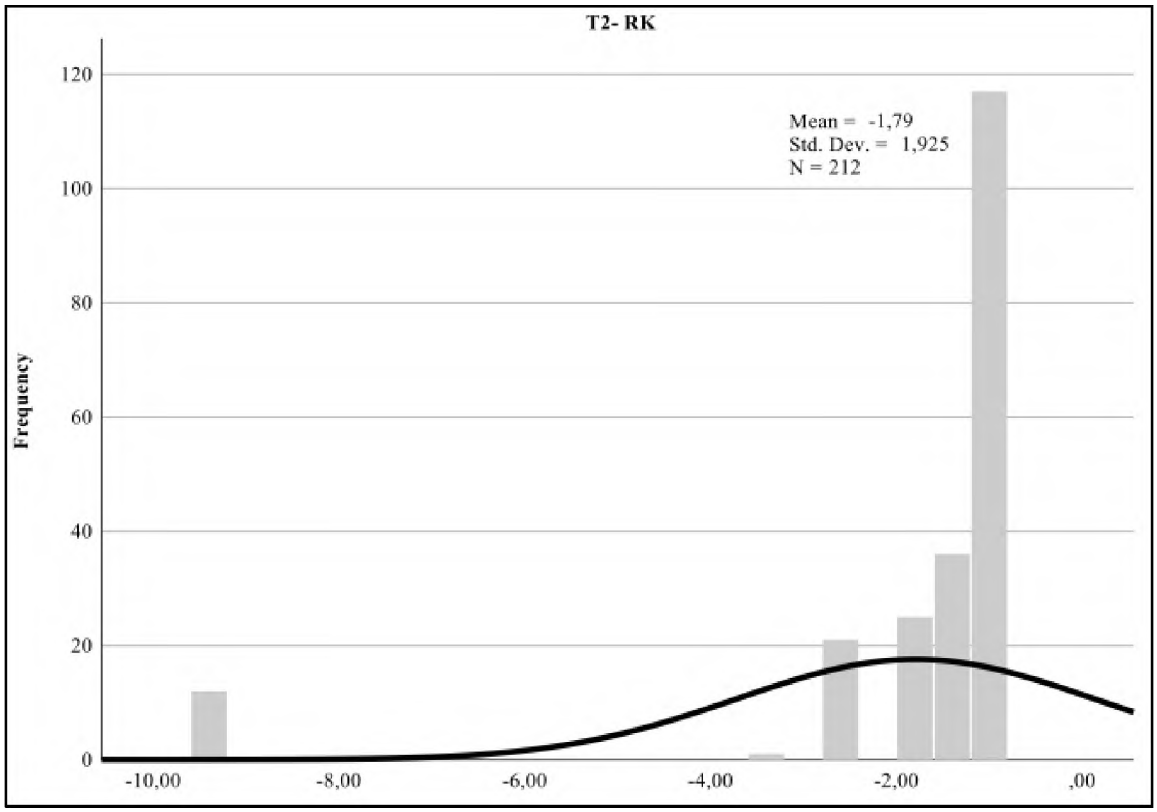


Figure 21. *Histogram with the Normal Curve: T2 Productive Knowledge*

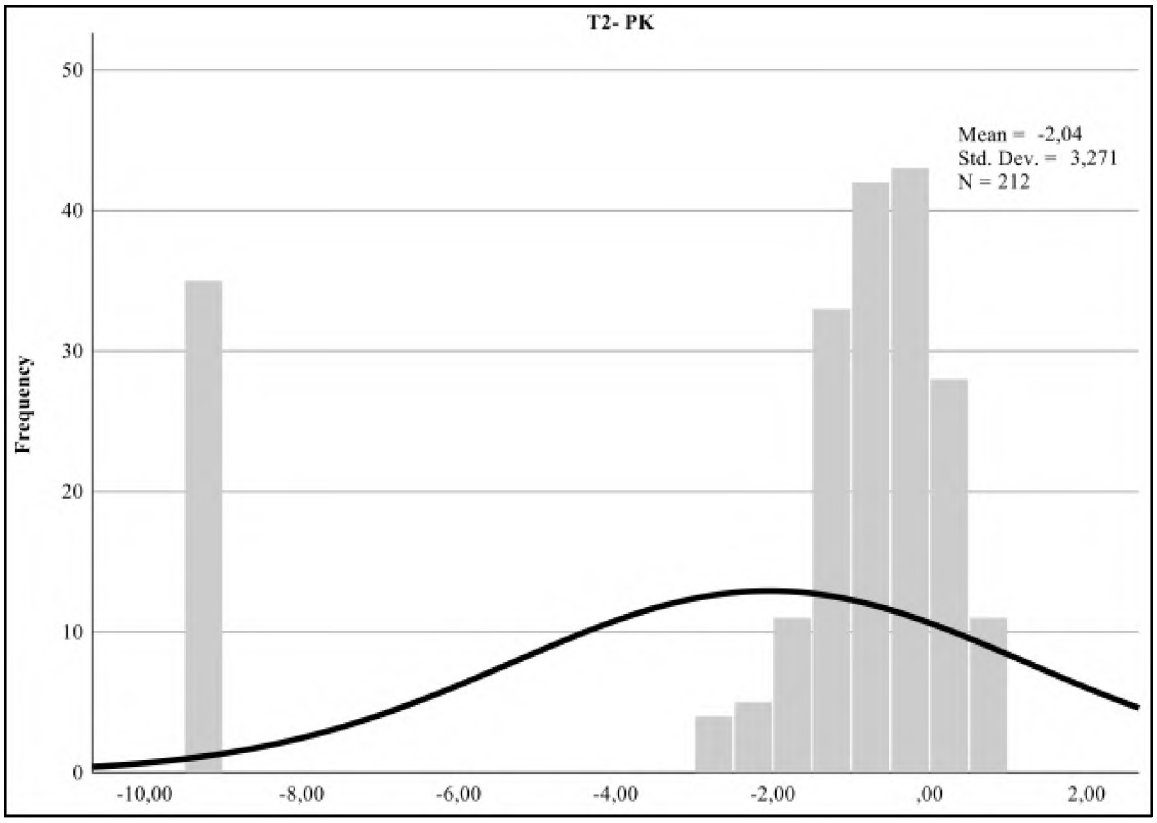


Figure 22. *Histogram with the Normal Curve: Exposure to English Outside the School*

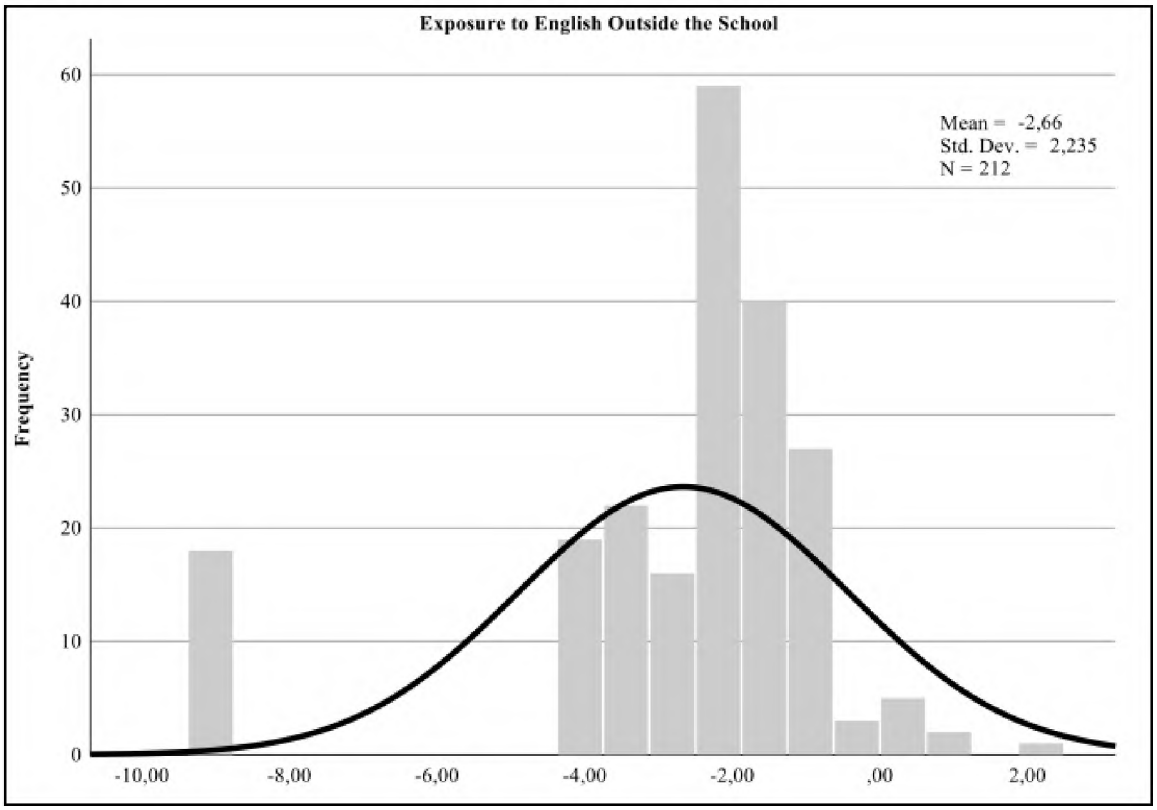


Figure 23. *Histogram with the Normal Curve: Exposure to English Music*

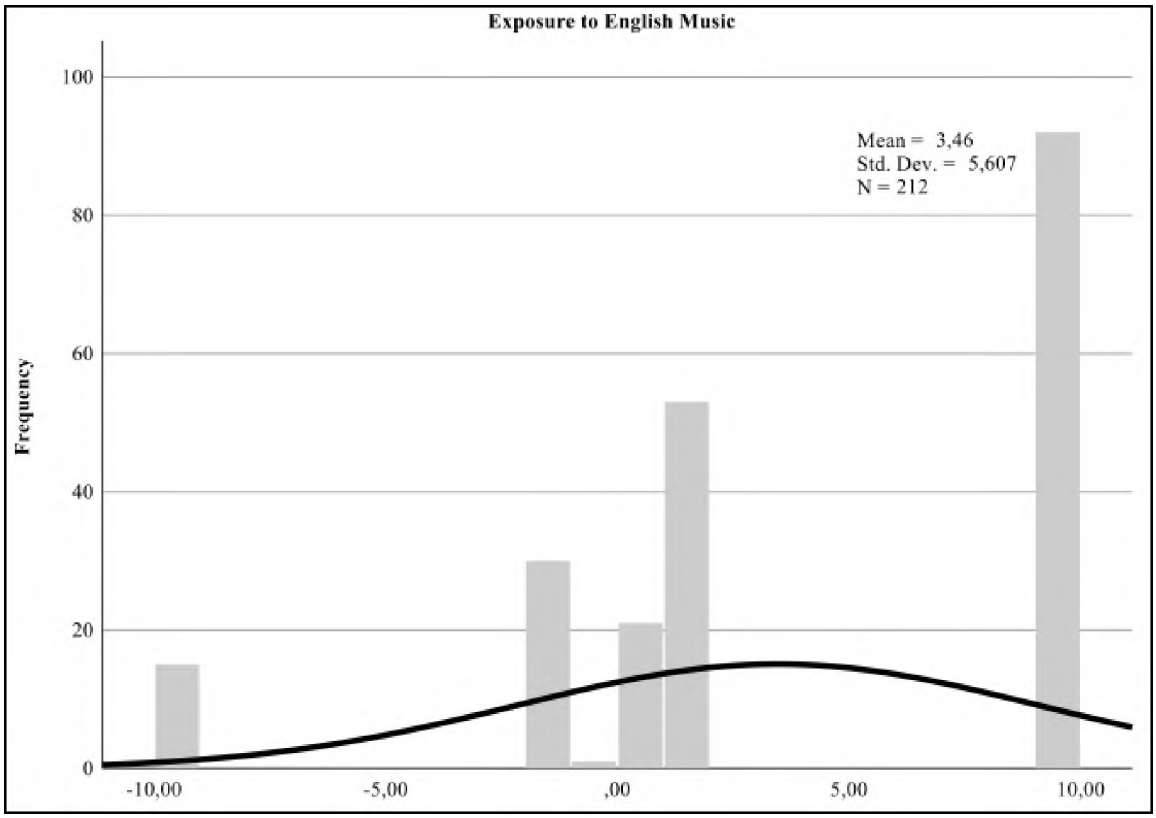


Figure 24. *Histogram with the Normal Curve: Preference for Pop Music*

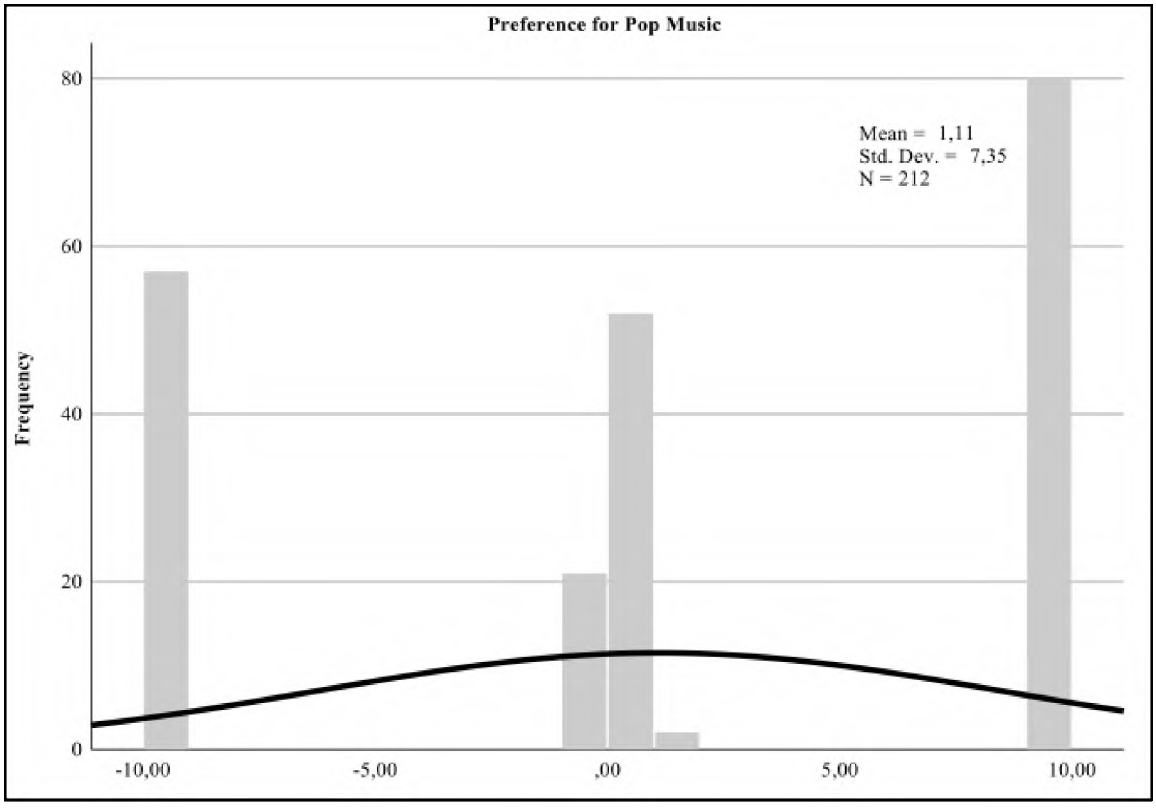


Figure 25. *Histogram with the Normal Curve: Willingness to Adapt the Method*

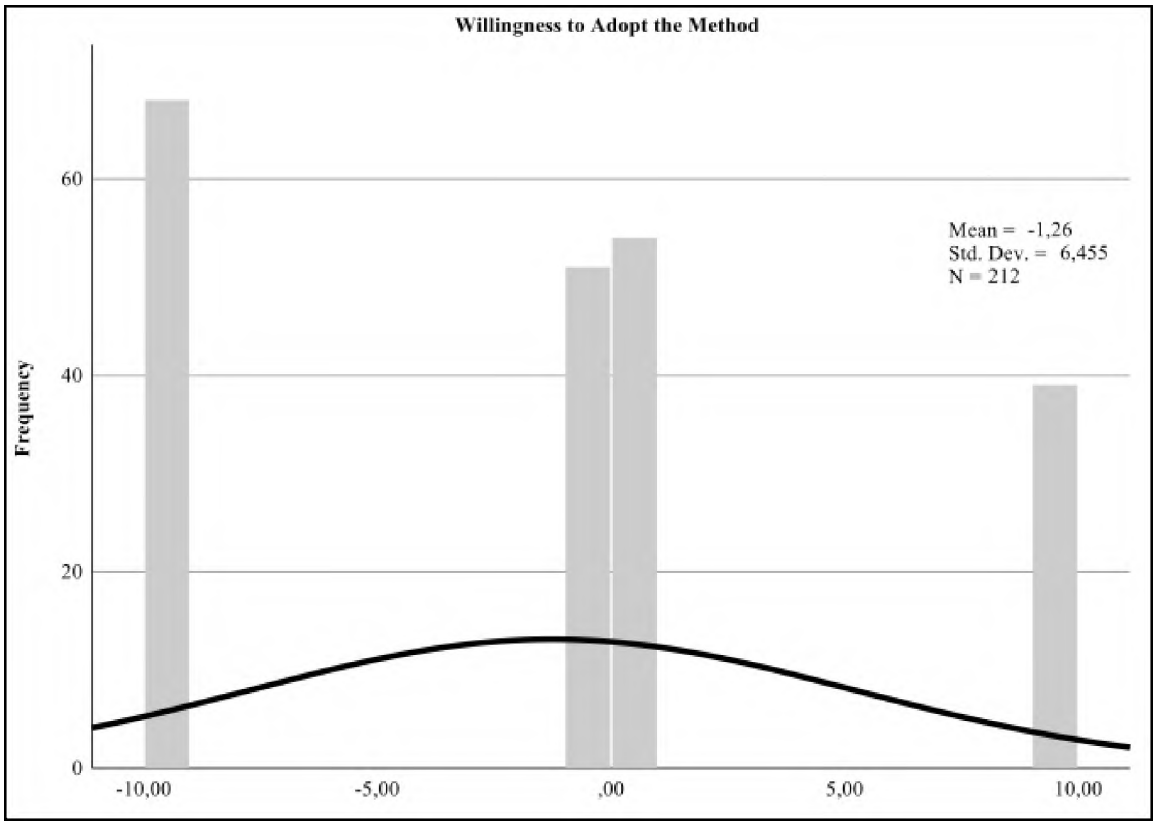


Figure 26. *Histogram with the Normal Curve: Exposure to Pop Songs*

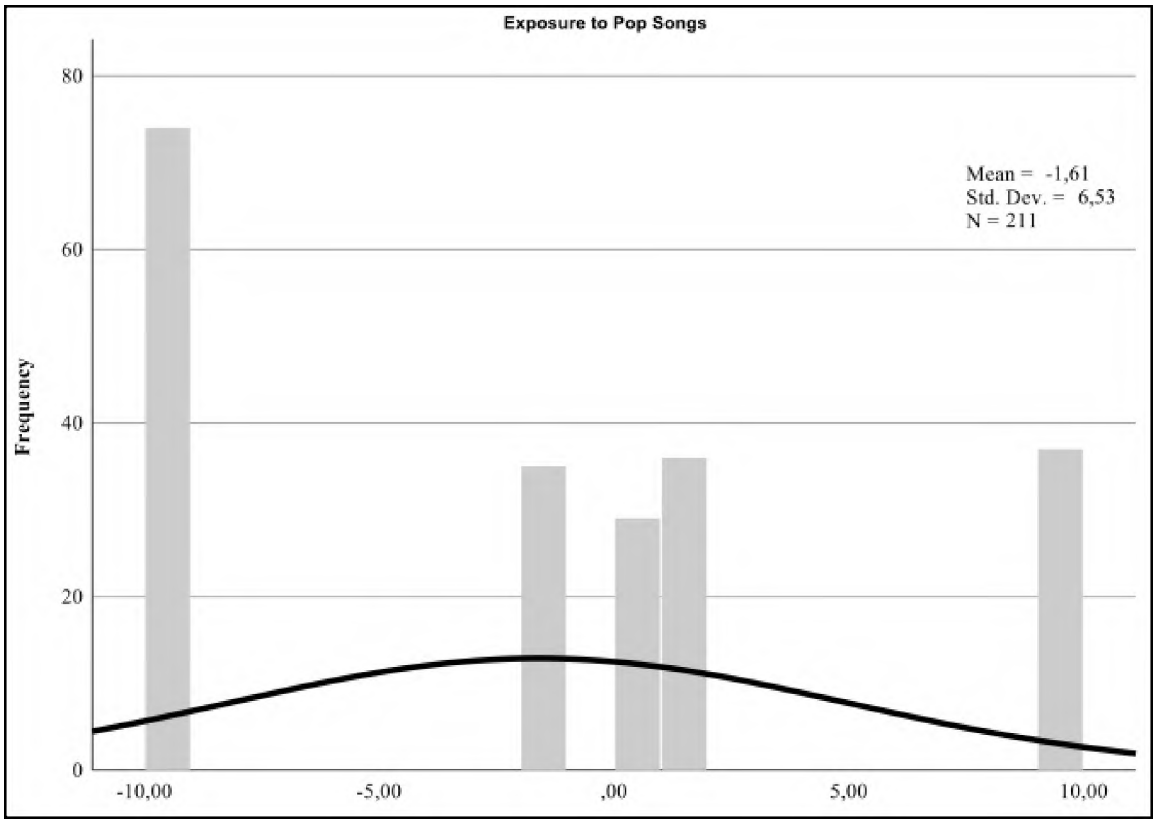


Figure 27. *Histogram with the Normal Curve: Musical Training*

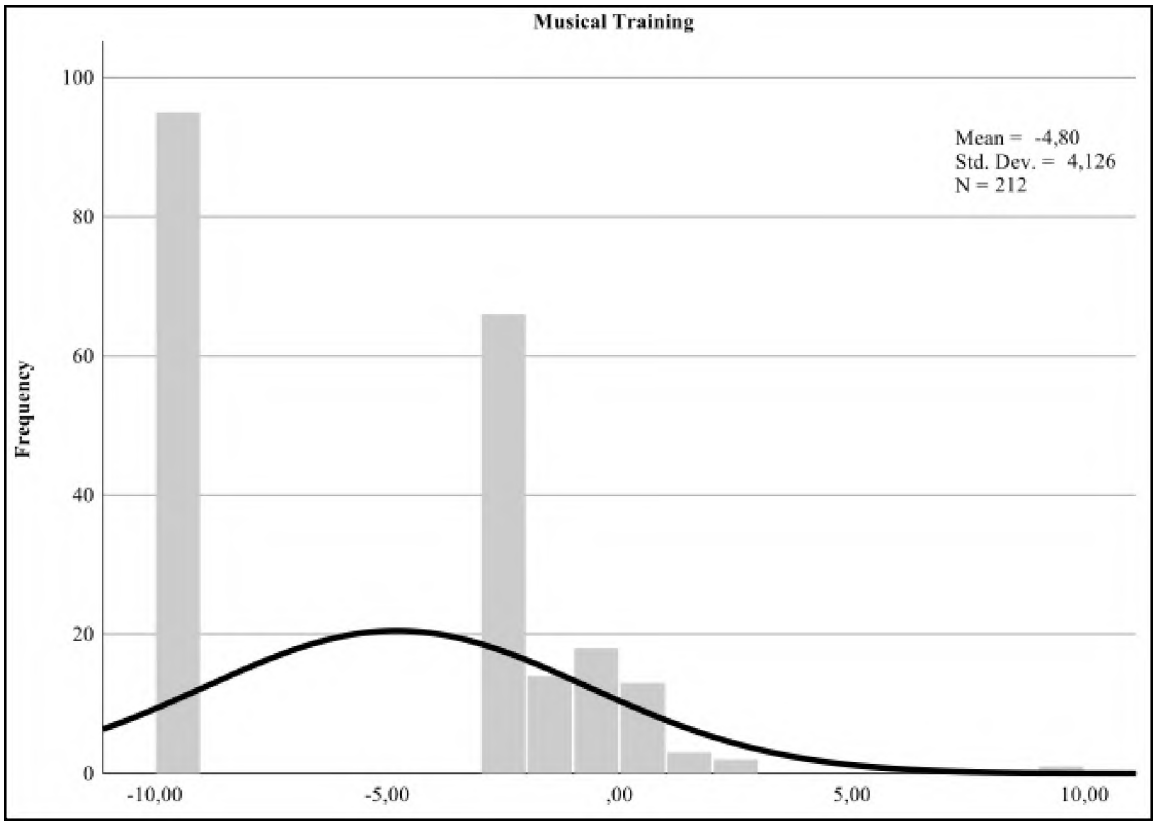


Figure 28. *Histogram with the Normal Curve: Relaxed Well-Being State*

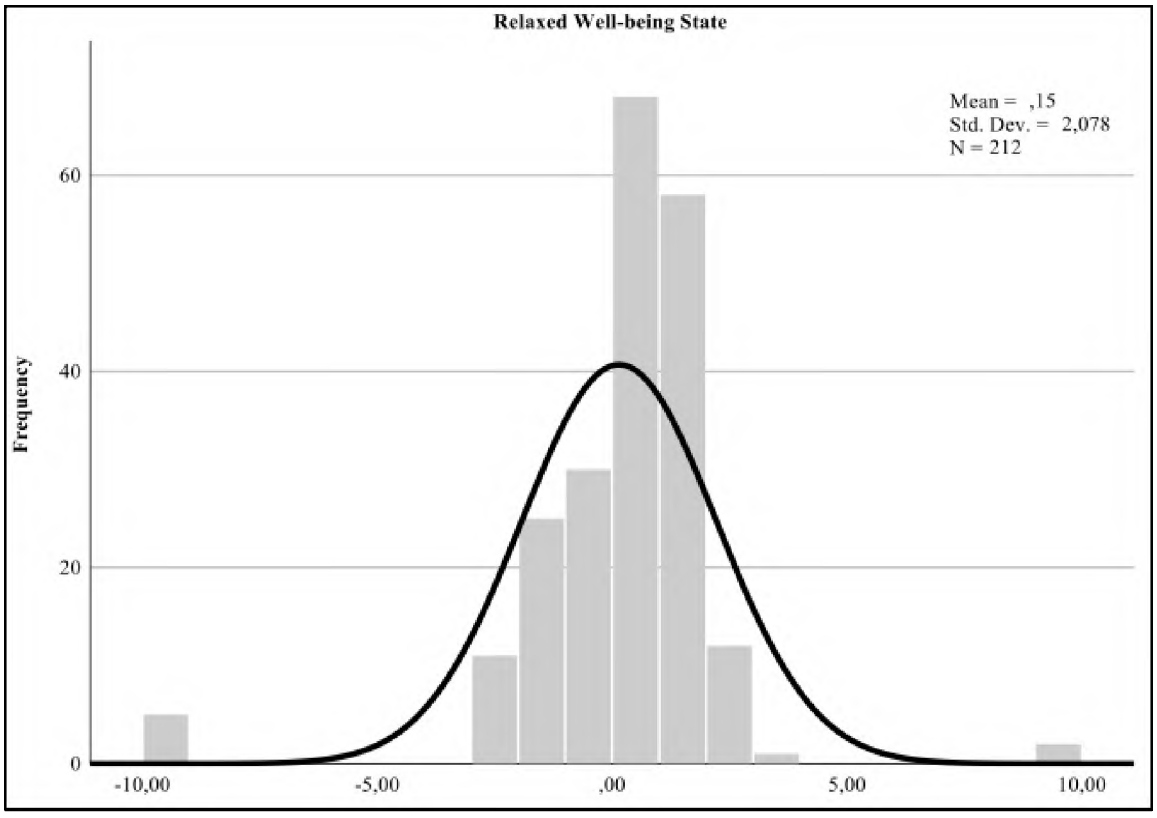


Figure 29. *Histogram with the Normal Curve: Song Stuck in My Head Phenomenon*

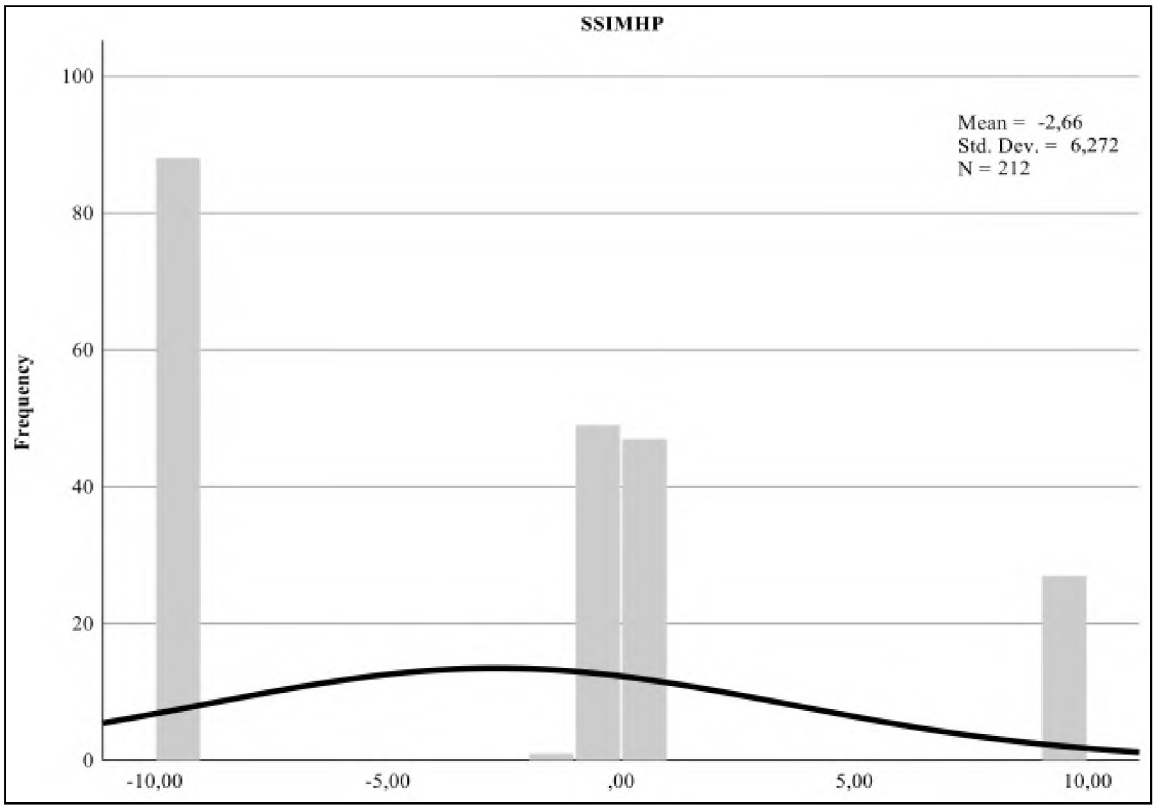


Figure 30. *Histogram with the Normal Curve: Pre-Intervention Perceived Music Benefits*

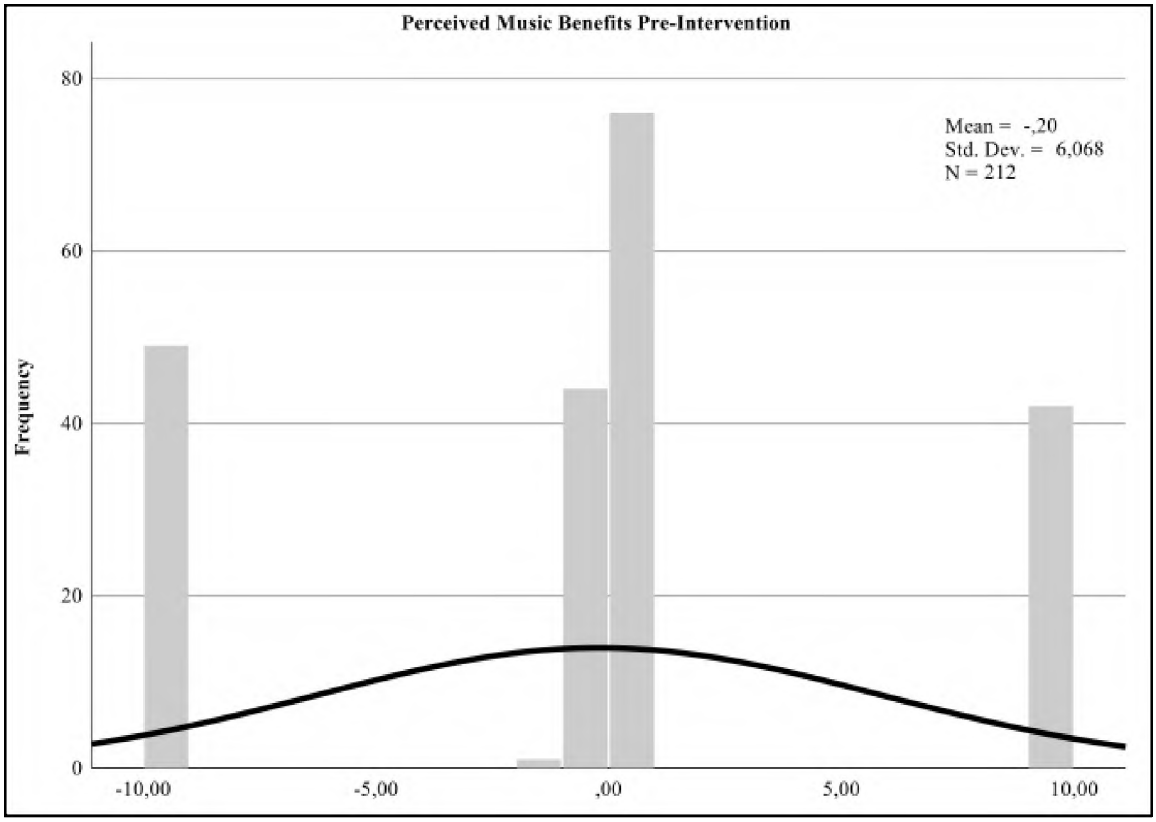


Figure 31. *Histogram with the Normal Curve: Post-Intervention Perceived Music Benefits*

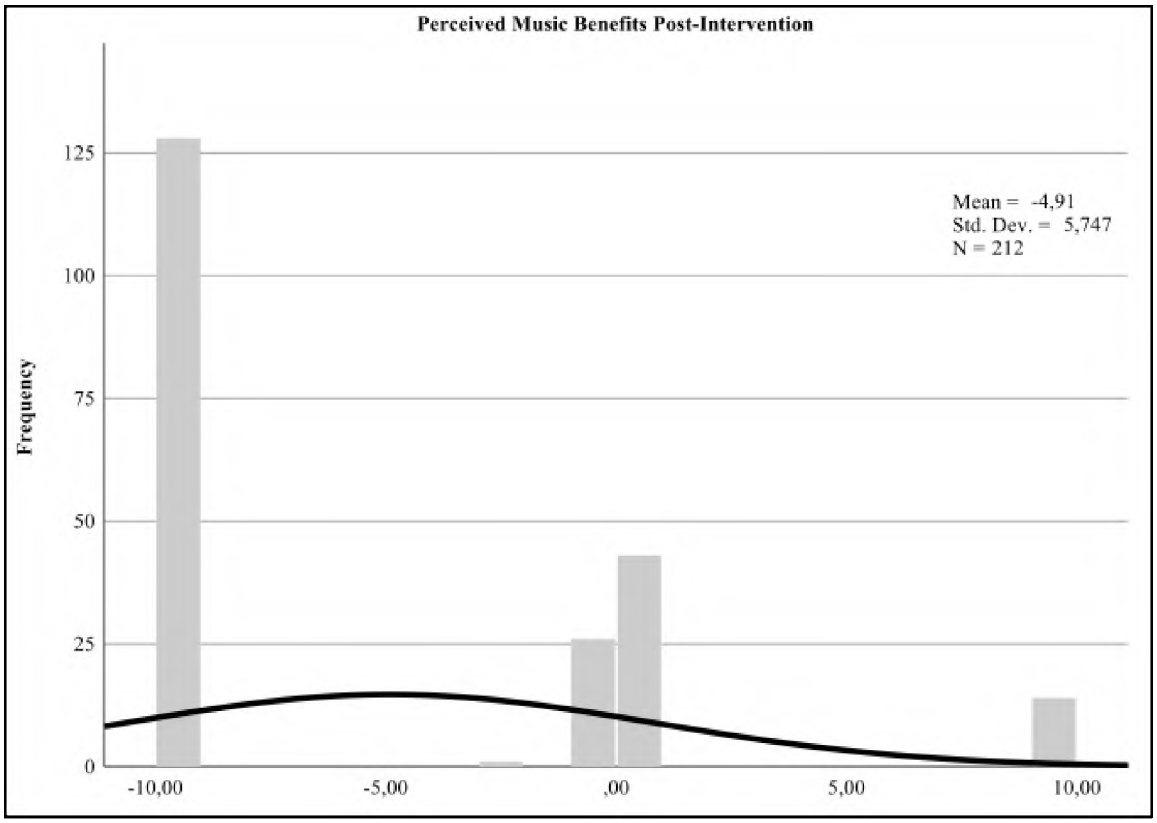


Figure 32. *Histogram with the Normal Curve: Self-Perceived Song Listening Comprehension*

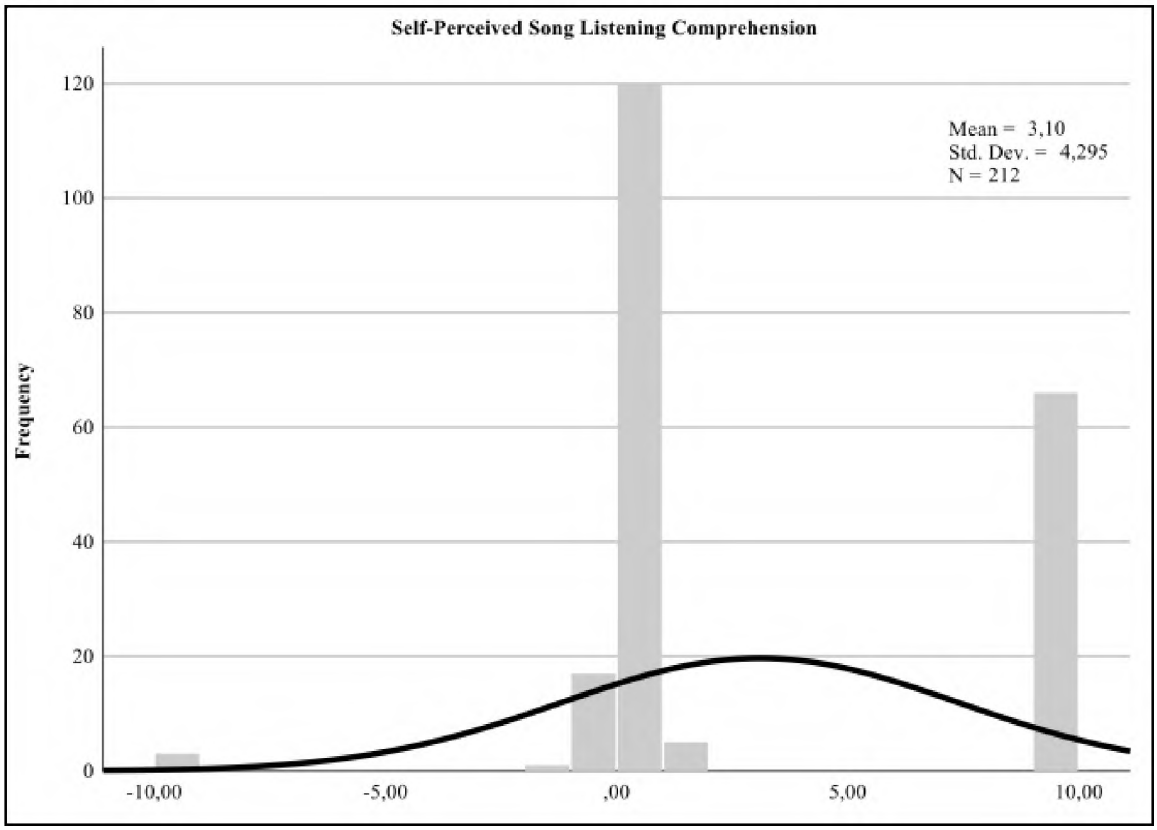


Figure 33. *Histogram with the Normal Curve: Self-Perceived Method Efficacy*

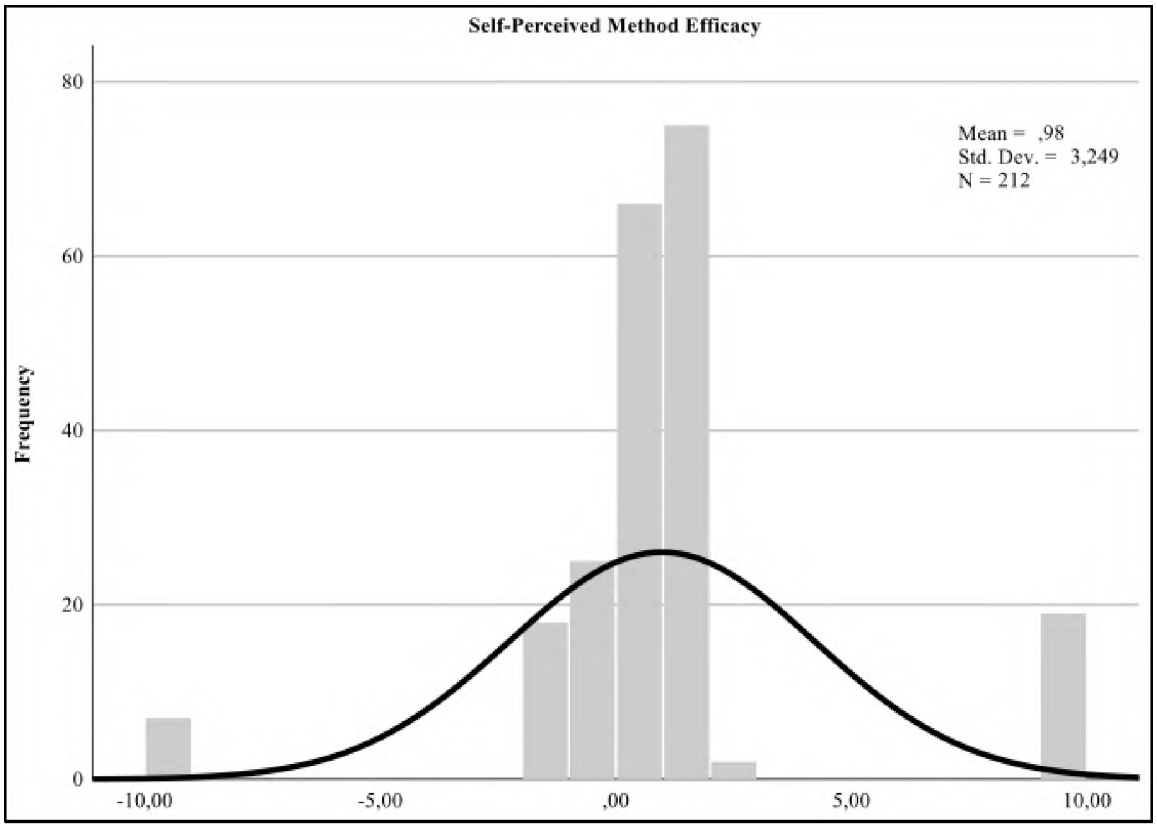
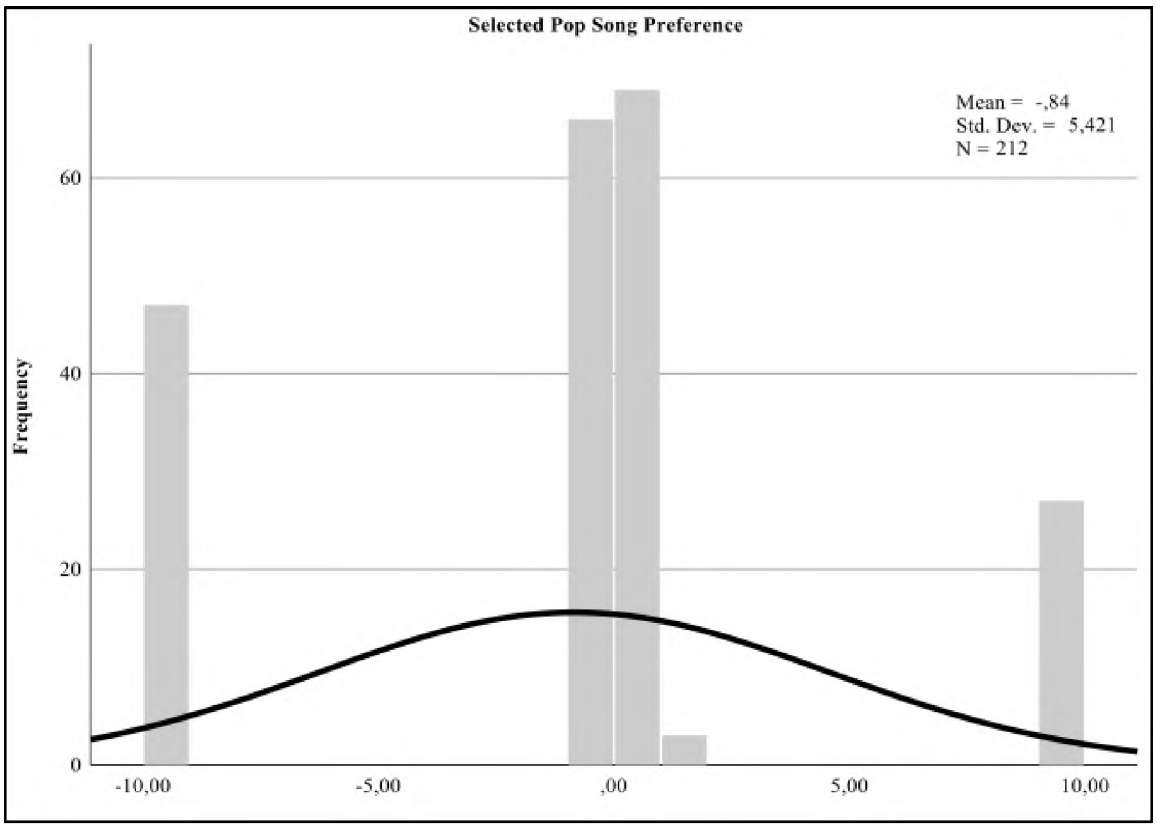


Figure 34. *Histogram with the Normal Curve: Pop Song Preference Distribution*



In summary, these 19 figures serve as indispensable diagnostic tools that guided every major statistical decision in this study. The severe deviations from normality visible in Figures 16-21 necessitated logit transformation—a decision that could not have been made confidently from skewness statistics alone (which ranged from -3.24 to -1.76 but did not reveal the full extent of distributional problems). Similarly, the bimodal patterns in Figures 22-27 identified heterogeneous subgroups requiring covariate control, while Figure 28's extreme kurtosis (10.82) mandated robust statistical procedures. Without these visual diagnostics, critical assumption violations would have remained hidden, potentially invalidating all MANCOVA results and subsequent conclusions about the intervention's effectiveness.

5.1.4 Summary and Conclusion

This section examined the sample characteristics (5.1.1), demographic balance through cross-tabulation analysis (5.1.2), and the distribution of continuous variables (5.1.3) to ensure the validity of group comparisons and the appropriateness of statistical assumptions. Although some smaller linguistic categories show slight gender imbalances, these differences are unlikely to significantly impact the study's findings due to their limited sample sizes.

The sample consisted of 212 participants distributed almost equally between the control (49.5%) and test (50.5%) groups, minimizing risks of group imbalance. Age (95.3% between 11-12 years), gender (53.8% female, 46.2% male), and linguistic background (66.5% German speakers) were relatively homogeneous, ensuring no systematic biases that could confound intervention effects. Cross-tabulations further confirmed that gender and bilingualism were evenly distributed across groups, reinforcing the study's internal validity.

The descriptive statistics of continuous variables revealed significant deviations from normality in key MWUs-related measures (*T0 RK*, *T0 PK*, *T1 RK*, and *T2 RK*), characterized by strong negative skewness and elongated left tails. In contrast, exposure, preference, and well-being variables exhibited more balanced distributions, although some measures (e.g., *well-being*) showed high kurtosis. Notably, *perceived music benefits post-intervention* displayed a ceiling effect, which may limit variability in post-test responses.

These findings indicate that the choosen variables violate normality assumptions, requiring logit transformation (Section 5.2.1) to correct for skewness before conducting MANCOVA.

5.2 Preprocessing and Preliminary Analysis of Variables

To ensure the validity of statistical analyses, it is essential to preprocess the dataset to confirm compliance with parametric assumptions. Given the substantial skewness and bounded nature of certain variables (as discussed in section 5.1.3), logit transformation was applied to reduce skewness, stabilize variance, and improve the suitability of the dataset for MANCOVA.

This section outlines key preprocessing steps undertaken before statistical analysis. First, logit transformation was applied (Section 5.2.1) to address skewness, heteroscedasticity, and boundary effects. Next, normality tests (Section 5.2.2) assessed whether the transformed dependent variables met parametric assumptions. Finally, chi-square tests (Section 5.2.3) were conducted to evaluate whether dependent variables were systematically associated with group assignment.

5.2.1 Logit Transformation for Bounded Data: Addressing Skewness and Boundary Effects

In this study, several key variables were measured on a percentage scale from 0 to 100, introducing skewness and boundedness, which necessitated normalization. Specifically, *T0 RK*, *T0 PK*, *T1 RK*, *T1 PK*, *T2 RK*, and *T2 PK* exhibited positive skewness, with the majority of participants scoring lower and a few outliers achieving very high scores. A similar right-skewed distribution was observed in *musical training*, where most participants reported minimal to moderate training, while a small subset had extensive training. Additionally, *perceived music benefits post-intervention* showed a concentration of responses in the upper range (80-100%), further contributing to right-skewness. *Exposure to English outside schoo*l and *exposure to pop songs* demonstrated a moderate right skew, as most participants reported limited exposure, whereas a smaller proportion had significantly higher engagement. *Self-perceived listening comprehension* followed a comparable pattern, with most participants rating their comprehension as moderate to high, leading to slight positive skewness. *Selected pop song preference* also exhibited a mild skew toward higher preference ratings. In contrast, *preference for pop music*, *well-being*, and SSIMHP (hereafter INMI) were distributed symmetrically, indicating no strong bias toward either extreme.

Beyond skewness, boundedness analysis identified notable floor and ceiling effects, further supporting the need for transformation. A floor effect (accumulation at 0%) was evident in *T0 RK* and *T0 PK*, where a substantial number of participants scored zero, indicating limited prior MWUs knowledge. Similarly, *musical training*, *exposure to English outside school*, and *exposure to pop songs* contained a non-neg-

ligible number of zero values, suggesting that some participants had no exposure to these elements. Conversely, ceiling effects (accumulation at 100%) were prominent in *perceived music benefits post-intervention*, suggesting a strong consensus regarding its benefits. Additionally, *self-perceived method efficacy* and *willingness to adopt the method* clustered near the upper end, potentially reflecting self-reporting bias.

These characteristics posed challenges for multivariate statistical methods such as MANCOVA, which assumes normally distributed and unbounded data (Lee, 2020; Seiffert et al., 2024). Given the significant skewness and the presence of floor and ceiling effects, normalization was essential to ensure the reliability of parametric analyses and maintain statistical assumptions. To address these issues, a logit transformation was applied, converting percentage values into a log-odds scale. This transformation, calculated as the logarithm of the ratio between a variable's value and its complement (100 minus the value), offered several advantages: It stabilized variance by reducing heteroscedasticity, mitigated right-skewed distributions such as vocabulary test scores and exposure measures, and enhanced symmetry, particularly for variables constrained within a 0-100 range. To prevent computational issues, boundary values were adjusted by replacing 0 with 0.0001 and 100 with 0.9999 before transformation, ensuring mathematical validity and minimizing the disproportionate influence of extreme values.

While logit transformation addresses key issues of skewness and boundedness, it remains essential to evaluate whether the transformed data meet the assumption of normality. The next section (5.2.2) conducts these diagnostic tests.

5.2.2 Normality Test of the Dependent Variables: T0, T1, and T2

Assessing the normality of the dependent variables was a crucial step in determining the suitability of parametric statistical methods. In this section, the distributional properties of the logit-transformed dependent variables—T0, T1, and T2—are evaluated in order to determine whether they meet the assumption of normality required for subsequent statistical analyses. Raw scores were calculated as the sum of correctly answered items for each participant at each time point, producing continuous test scores. For the main analyses, RK and PK were combined into a composite score to capture overall MWU knowledge.

Because these raw scores are bounded and exhibited skewness, a logit transformation was applied to each time point (T0, T1, T2) to better approximate normal distributions. The following section evaluates the distributional properties of these logit-transformed dependent variables in order to determine whether they meet the assumption of normality required for subsequent statistical analyses.

Descriptive statistics, including measures of central tendency, variability, skewness, and kurtosis, provide an initial indication of the distributional characteristics of each variable. Additionally, formal normality tests, including the Kolmogorov-Smirnov and Shapiro-Wilk tests, are conducted to assess whether these variables significantly deviate from a normal distribution. Graphical representations, such as histograms with superimposed normal curves, further illustrate the distributional patterns of the data.

The dependent variables (T0, T1, T2) represent composite MWU knowledge scores combining both receptive and productive components. Raw scores were calculated as follows: For each time point, participants completed two tasks—a gap-filling task measuring receptive knowledge (8 items, 1 point each) and a writing task measuring productive knowledge (8 items, 1 point each), yielding a maximum possible score of 16 points. These raw scores were then converted to percentages (score/16 × 100) and subsequently logit-transformed using the formula logit(p) = ln[p/(1-p)], where p represents the proportion of correct responses. To prevent computational errors, boundary adjustments were applied: scores of 0% were replaced with 0.01% and scores of 100% were replaced with 99.99% before transformation. The resulting logit scores range from -9.21 to 9.21, with negative values indicating below-average performance and positive values indicating above-average performance. Table 26 summarizes the descriptive statistics for the transformed dependent variables.

Table 26. *Descriptive Statistics of the Dependent Variables*

Descriptives				
			Statistic	Std. Error
T0 after logit transformation	Mean		-1,842	0,199
	95% confidence interval for mean	Lower bound	-2,235	
		Upper bound	-1,449	
	5% trimmed mean		-1,61	
	Median		-1,046	
	Variance		8,424	
	Std. deviation		2,902	
	Minimum		-9,21	
	Maximum		2,20	
	Range		11,41	

Descriptives				
	Interquartile range		1,86	
	Skewness		-1,785	0,167
	Kurtosis		2,183	0,333
T1 after logit transformation	Mean		-0,156	0,173
	95% confidence interval for mean	Lower bound	-0,496	
		Upper bound	0,184	
	5% trimmed mean		0,13	
	Median		0,282	
	Variance		6,309	
	Std. deviation		2,512	
	Minimum		-9,21	
	Maximum		9,21	
	Range		18,42	
	Interquartile range		1,78	
	Skewness		-2,069	0,167
	Kurtosis		7,226	0,333
T2 after logit transformation	Mean		-0,082	0,150
	95% confidence interval for mean	Lower bound	-0,377	
		Upper bound	0,214	
	5% trimmed mean		0,086	
	Median		0,201	
	Variance		4,76	
	Std. deviation		2,182	
	Minimum		-9,21	
	Maximum		9,21	
	Range		18,42	
	Interquartile range		1,59	
	Skewness		-1,909	0,167
	Kurtosis		9,529	0,333

Note. *T0 = Pre-test composite score; T1 = Immediate post-test composite score; T2 = Delayed post-test composite score (two weeks after T1). Each composite score combines receptive knowledge (gap-filling task, 8 items) and productive knowledge (writing task, 8 items) for a maximum of 16 points, converted to percentages and*

then logit-transformed. All numerical values have been rounded to three decimal places for readability, following standard academic reporting conventions. Original calculations were performed using SPSS with higher precision. N = 212.

For T0, the mean (-1.8417) and median (-1.0460) suggest that the data values are skewed toward the lower end of the transformed scale, with a strong negative skewness (-1.785) indicating a long left tail. The standard deviation (2.90244) and wide range (11.41) highlight substantial variability, although most data points appear concentrated away from the extreme values. Kurtosis (2.183) shows that the distribution has heavier tails than a normal distribution but is not excessively peaked.

For T1, the mean (-0.1557) and median (0.2819) are closer to zero compared to T0, suggesting a more balanced distribution but still with a slight concentration of positive values. However, the high negative skewness (-2.069) and substantial kurtosis (7.226) indicate a sharper peak and more extreme tails, implying the presence of significant outliers on both ends of the distribution. The standard deviation (2.51174) reflects moderate variability, while the large range (18.42) and interquartile range (1.78) suggest that the data include some extreme values in both directions.

For T2, the mean (-0.0818) is near zero, and the median (0.2007) is slightly positive, indicating a relatively balanced distribution with a small shift toward positive values. However, skewness (-1.909) and kurtosis (9.529) demonstrate a very strong negative skew and an extremely peaked distribution, suggesting the data are concentrated around the center but include extreme outliers. The standard deviation (2.18181) is lower than in T0 and T1, suggesting less overall variability, but the range (18.42) remains wide due to these outliers.

Overall, the logit transformation adjusted the bounded nature of the original data, but the resulting distributions remained highly skewed and exhibited significant kurtosis. This suggests that while the transformation helped address normality issues to some extent, the presence of extreme values and skewness may have influenced subsequent analyses. These characteristics highlight the need for careful interpretation of results and consideration of the impact of outliers.

The tests of normality for T1 and T2 after logit transformation assess whether the data distributions significantly deviate from normality. For T1, the Kolmogorov-Smirnov test yielded a statistic of 0.028 with a significance value (p-value) of 0.200, and the Shapiro-Wilk test resulted in a statistic of 0.991 with a p-value of 0.223. Similarly, for T2, the Kolmogorov-Smirnov test yielded a statistic of 0.031 with a p-value of 0.200, while the Shapiro-Wilk test yielded a statistic of 0.994 with a p-value of 0.522.

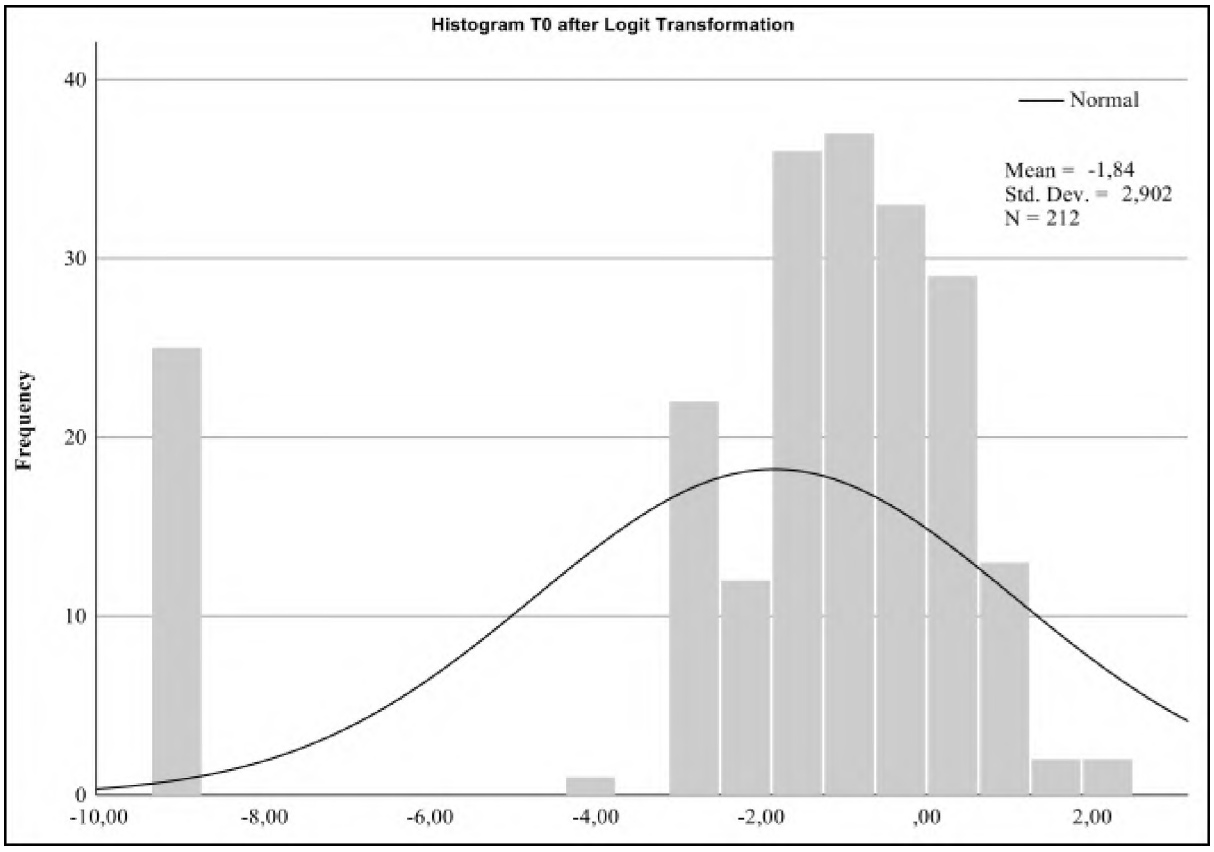
Table 27. *Tests of Normality for Transformed Variables*

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
T0 after logit transformation	0,021	212	0,112	0,723	212	0,124
T1 after logit transformation	0,028	212	0,200	0,991	212	0,223
T2 after logit transformation	0,031	212	0,233	0,994	212	0,522
a. Lilliefors significance correction						

The Kolmogorov-Smirnov and Shapiro-Wilk tests (Table 27) confirmed that T0, T1, and T2 did not significantly deviate from normality, suggesting that the transformed data met the parametric assumptions required for MANCOVA. Indeed, all p-values > 0.05, indicating no significant deviation from normality.

Additionally, Figures 35-37 display histograms and boxplots, visually confirming that the transformed variables approximated normal distributions, reinforcing their suitability for parametric analyses.

Figure 35. *Histogram and Boxplot of T0 after Logit Transformation*



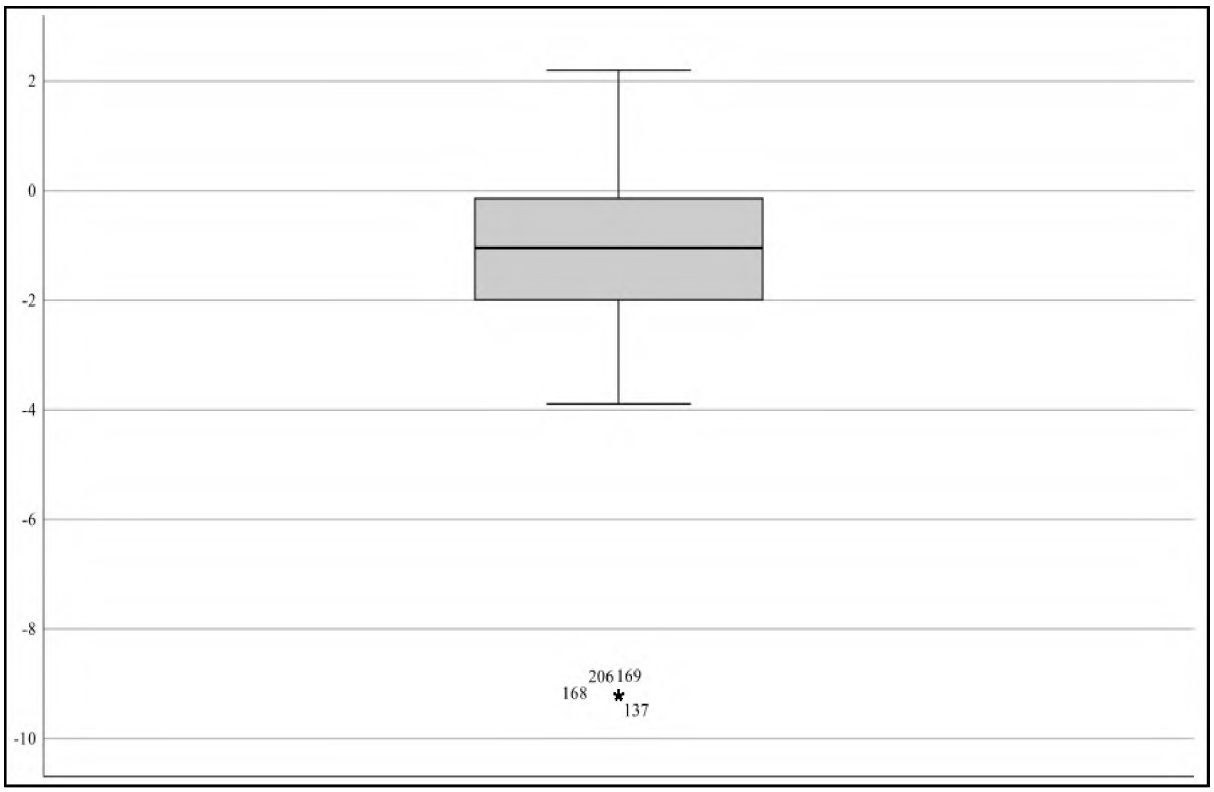
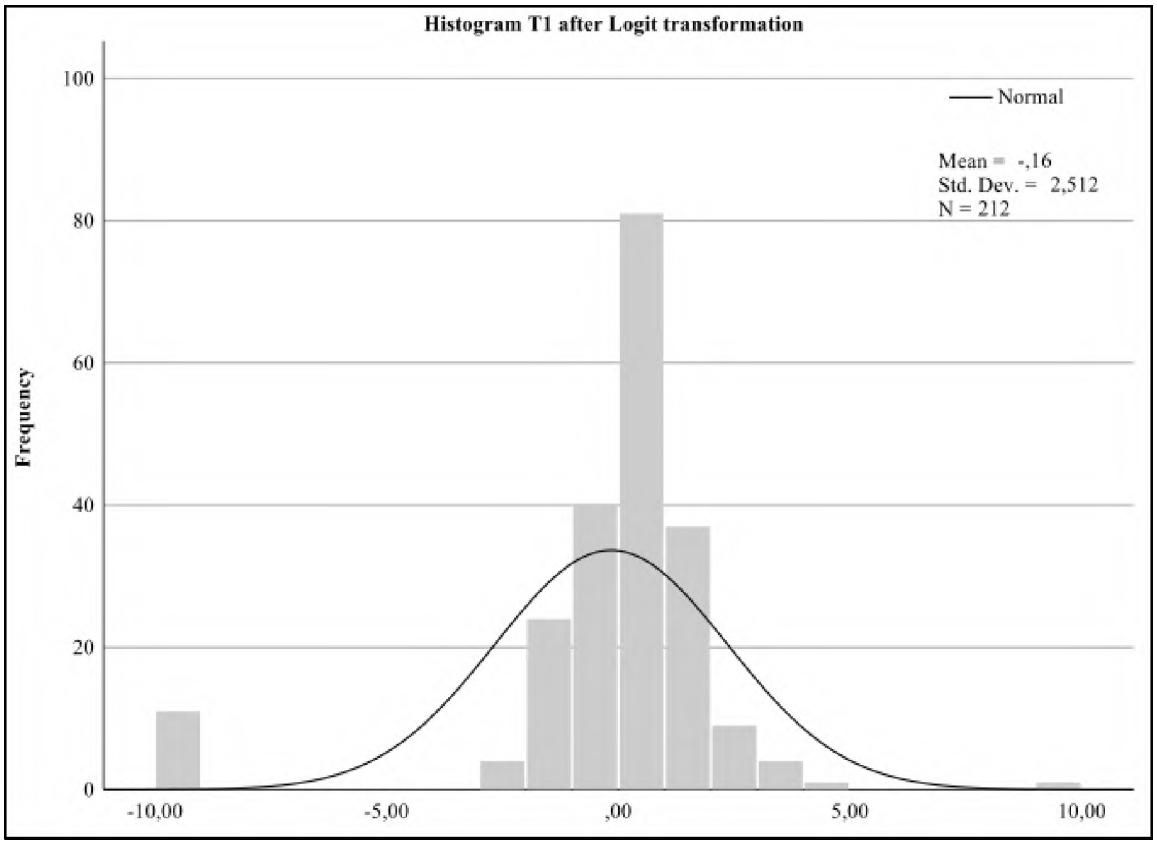


Figure 36. *Histogram and Boxplot of T1 after Logit Transformation*



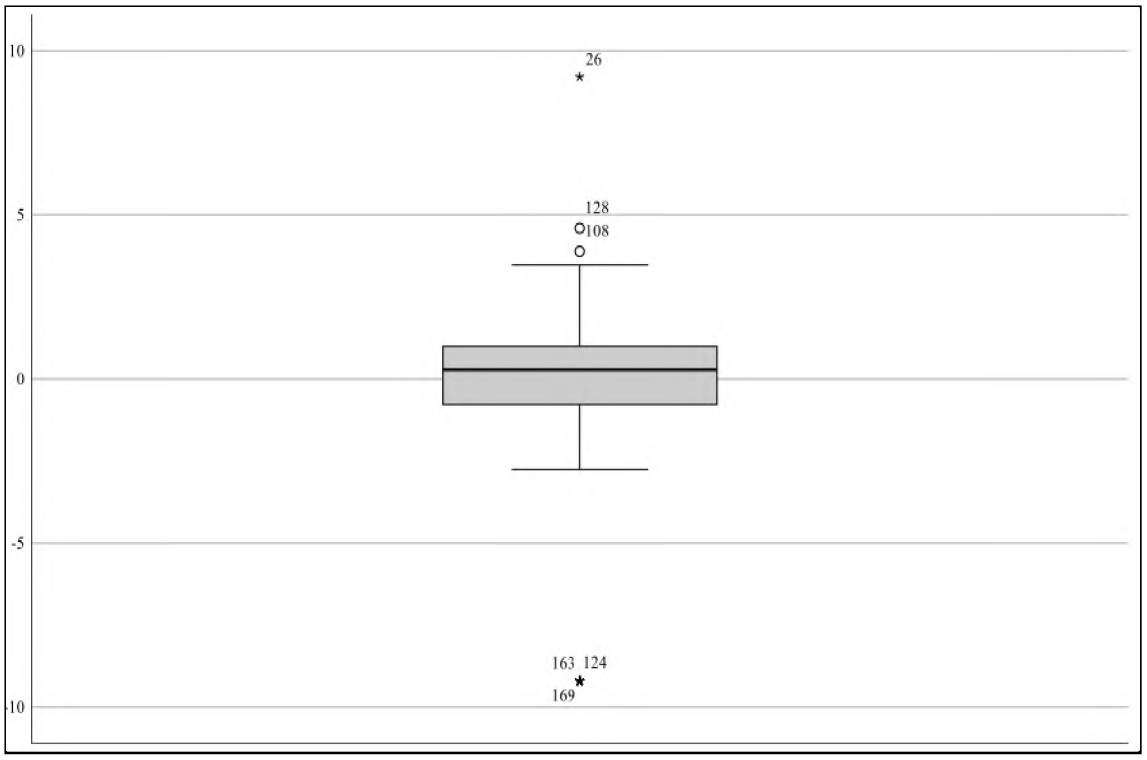
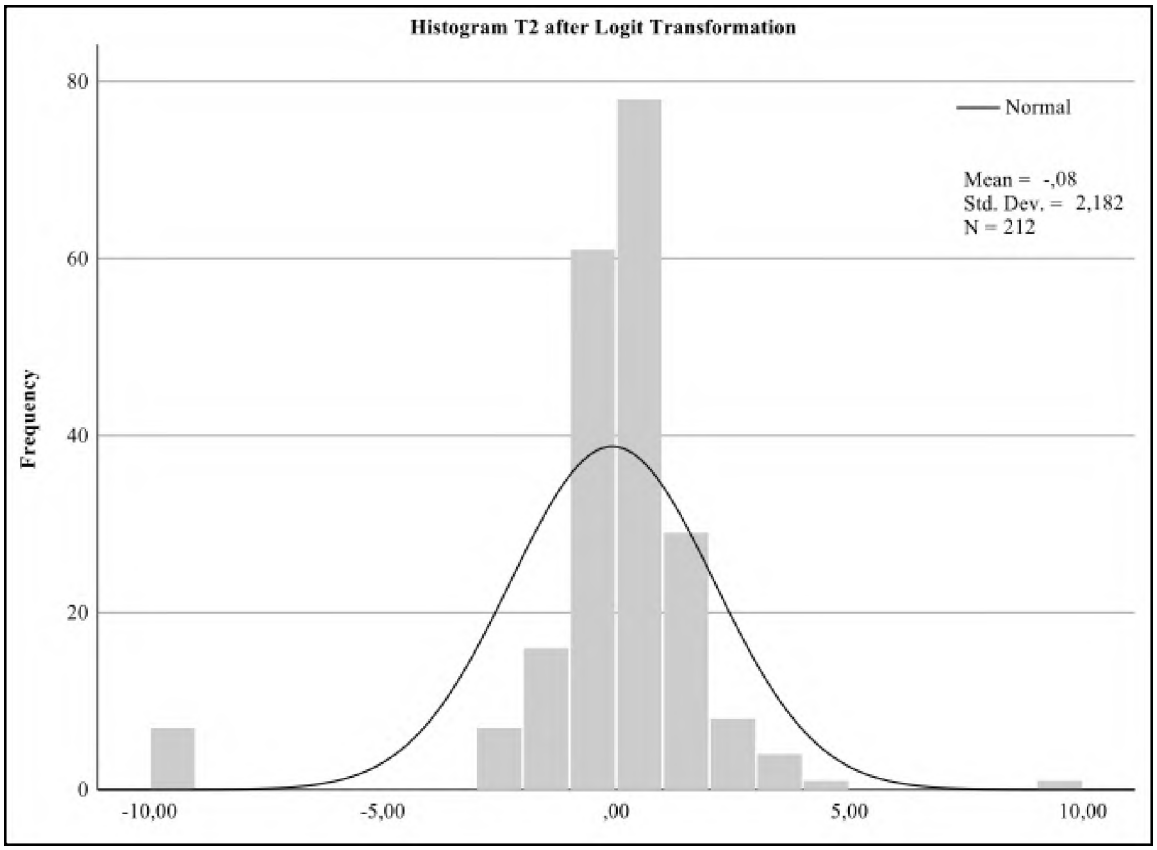
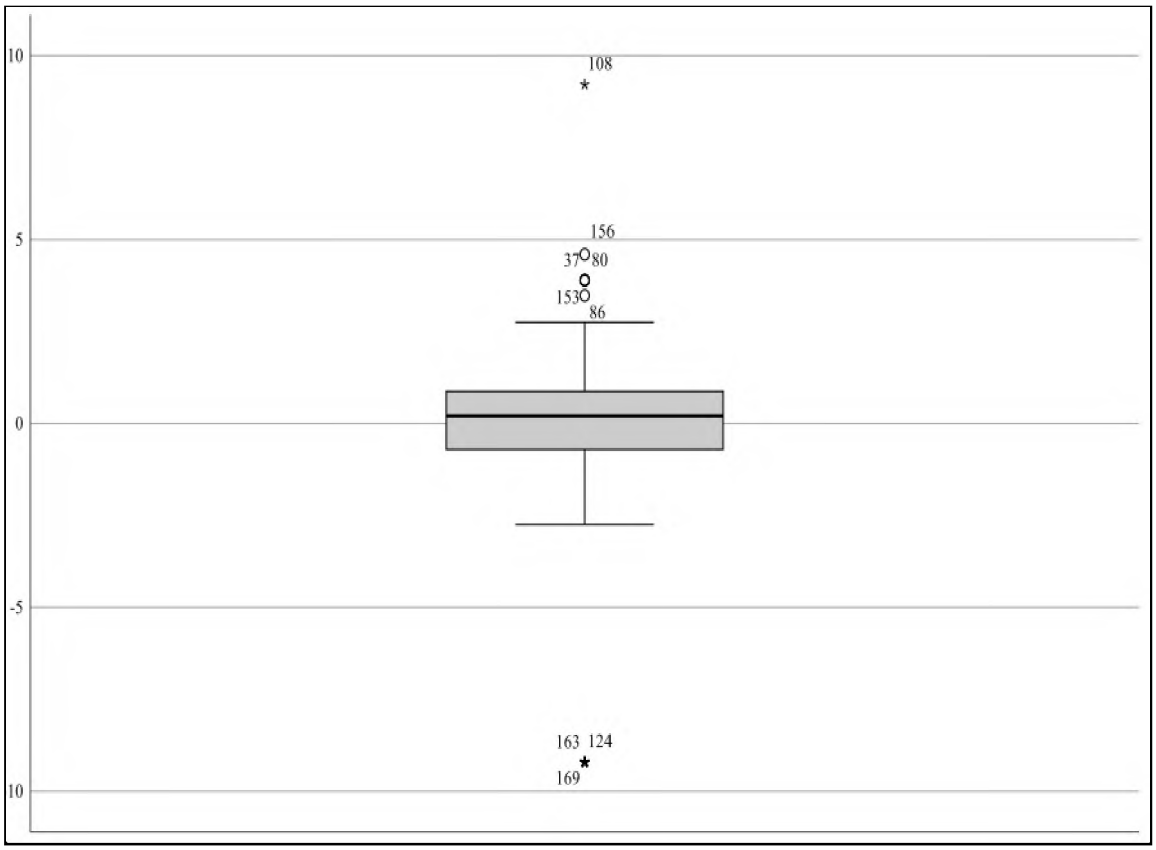


Figure 37. *Histogram and Boxplot of T2 after Logit Transformation*





The results indicated that the transformed dependent variables did not significantly deviate from normality, satisfying a key assumption for MANCOVA. While normality tests confirmed the suitability of parametric analysis, it was equally important to examine whether the dependent variables were systematically associated with group assignments. This step ensured that no unintended pre-existing differences between groups could have influenced the MANCOVA results.

5.2.3 The Association Chi-Square Test Between T0, T1, T2, and the Group

Ensuring that T0, T1, and T2 were not systematically linked to group assignment was critical in confirming that observed vocabulary gains resulted from the intervention rather than pre-existing imbalances. The Chi-Square test thus serves as a necessary step in validating the internal consistency of the study's design. The results indicated that T0 and T1 showed no significant association with group assignment, reinforcing the study's randomization integrity. In contrast, T2 exhibited mixed results, with the Likelihood Ratio test suggesting a significant association. While this finding does not necessitate additional covariate adjustments, it should be considered when interpreting the results of subsequent analyses.

Table 28. *Chi-Square Test: Association Between T0 Scores and Group Assignment*

Chi-square tests			
	Value	df	Asymptotic significance (2-sided)
Pearson Chi-Square	53,467[a]	59	0,679
Likelihood ratio	70,047	59	0,154
Linear-by-linear association	1,994	1	0,158
N of valid cases	212		
a. 110 cells (91,7%) have expected count less than 5. The minimum expected count is ,50.			

The Pearson Chi-Square test ($\chi^2 = 53.467$, $df = 59$, $p = 0.679$) did not indicate a significant association between the study variables and group assignment. Similarly, the Likelihood Ratio test ($\chi^2 = 70.047$, $p = 0.154$) and the linear-by-linear association test ($p = 0.158$) provided no statistical evidence of a systematic relationship. These results suggest that any observed group differences in subsequent inferential analyses (MANCOVA) are unlikely to be confounded by initial group imbalances, reinforcing the validity of the study's investigation.

Table 29. *Chi-Square Test: Association Between T1 Scores and Group Assignment*

Chi-square tests			
	Value	df	Asymptotic significance (2-sided)
Pearson Chi-Square	66,849[a]	80	0,853
Likelihood ratio	86,689	80	0,285
Linear-by-linear association	0,213	1	0,644
N of valid cases	212		
a. 159 cells (98,1%) have expected count less than 5. The minimum expected count is ,50.			

The Chi-Square test results for the relationship between T1 and the group variable indicate no statistically significant association. The Pearson Chi-Square test produced a value of 66.849 with 80 degrees of freedom and a *p*-value of 0.853, suggesting that the observed differences between groups are not significant. Similarly, the Likelihood Ratio test, with a value of 86.689 and a *p*-value of 0.285, reinforces this conclusion. The linear-by-linear association test, which evaluates the presence of a linear trend between the variables, also found no significant relationship, as evidenced by a *p*-value of 0.644. However, it is important to highlight that the assumptions for the Chi-Square test were not fully satisfied.

While, the Chi-Square test results for the relationship between T2 and the group variable suggested mixed outcomes.

Table 30. *Chi-Square Test: Association Between T2 Scores and Group Assignment*

Chi-square tests			
	Value	df	Asymptotic significance (2-sided)
Pearson Chi-Square	73,530[a]	70	0,363
Likelihood ratio	95,467	70	0,023
Linear-by-linear association	1,009	1	0,315
N of valid cases	212		
a. 140 cells (98,6%) have expected count less than 5. The minimum expected count is ,50.			

The Pearson Chi-Square test yielded a value of 73.530 with 70 degrees of freedom and a *p*-value of 0.363, indicating no statistically significant association be-

tween the variables. However, the Likelihood Ratio test, with a value of 95.467 and a *p*-value of 0.023, suggests a statistically significant relationship. This discrepancy could be due to differences in how the two tests handle sparse data. The linear-by-linear association test, which checks for a linear trend, found no significant relationship, with a *p*-value of 0.315.

In conclusion, the preprocessing steps successfully mitigated skewness and boundedness, allowing for logit-transformed data to meet normality assumptions. The Chi-Square tests confirmed no systematic biases in group assignment, ensuring that any observed effects in MANCOVA reflect true intervention effects rather than pre-existing differences.

5.3 Statistical Methodology for the Second Study: Rationale for MANCOVA

Given the study's focus on multiple interrelated outcome variables, MANCOVA was selected as the primary statistical method. MANCOVA offers several key advantages, particularly its ability to control for covariates, enhance statistical power, and reduce Type I error rates when analyzing multiple dependent variables simultaneously (Tabachnick & Fidell, 2013; Hair et al., 2018).

This study examined the impact of vocal training with English pop songs on the learning of MWUs in an EFL context, requiring an analytical framework that accounted for both productive and receptive knowledge at different time points (T1, T1, and T2). MANCOVA was particularly well-suited for this purpose, as it evaluates group differences while considering the correlations between dependent variables, thereby providing a more comprehensive assessment of the intervention's impact (Huberty & Olejnik, 2005; Stevens, 2009).

A key advantage of MANCOVA is its ability to control for confounding variables, such as *prior English MWUs knowledge*, *gender*, *musical training*, and *exposure to English* or *pop songs outside the school* (Field, 2013). By incorporating these covariates into the model, MANCOVA ensured that observed differences between groups are more accurately attributed to the intervention rather than external influences.

Despite its reliance on assumptions such as multivariate normality and homogeneity of variance-covariance matrices, MANCOVA is relatively robust to moderate violations, making it a practical choice for analyzing complex educational data (Tabachnick & Fidell, 2013). Furthermore, given that several dependent variables in this study were measured on a percentage scale, a logit transformation was applied to address issues of skewness, heteroscedasticity, and boundary effects, ensuring that

the data met the assumptions necessary for multivariate analysis (Lee, 2020; Seiffert et al., 2024).

In sum, MANCOVA offered the most appropriate framework for evaluating the efficacy of the music-based vocabulary learning intervention in this EFL context in comparison with a non-music-based approach.

5.4 Results and Analyses

This section presents the statistical analyses conducted to examine the research questions and their results. To ensure clarity and coherence in interpreting the findings, the results are structured according to the three research questions. section 5.5.1 examines the extent to which the music-based approach—vocal training with pop songs—enhanced the productive and receptive learning of MWUs compared to a non-music-based approach. section 5.5.2 investigates to what extend the music-based approach contributed to participants' well-being in comparison with the non-music-based approach and whether this well-being, in turn, influenced their MWU learning. section 5.5.3 explores the occurrence of INMI and its potential role in enhancing MWU learning.

5.4.1 Statistical Analyses of the Effect of Vocal Training with Pop Songs on Multi-Word Unit Learning in English as Foreign Language Compared to a Non-music-based Approach

This section examines the extent to which a music-based approach involving vocal training with English pop songs enhances the receptive and productive knowledge of MWUs in an EFL context at the lower secondary level. The statistical analysis follows a structured progression, beginning with the distribution of participants, followed by descriptive statistics, inferential analyses, and finally effect size calculations. This stepwise approach ensures methodological rigor while systematically addressing research question 1 (RQ1).

The analysis began by examining the distribution of participants across the test (musical) and control (non-music-based) groups to ensure comparability. Establishing a balanced sample is crucial for the validity of subsequent analyses, as it minimizes the risk of bias and ensures that observed differences in MWU learning can be attributed to the intervention rather than pre-existing disparities. Following this, descriptive statistics summarize central tendencies and variability in receptive and productive knowledge of MWUs at different time points (T0, T1, and T2). This preliminary assessment provides an overview of trends in MWUs development across both groups before conducting inferential analyses.

To determine whether the intervention resulted in significant group differences, a between-subjects effects analysis was conducted while controlling for key covariates such as prior *English MWUs knowledge*, *gender*, *L1/ bilingualism*, and *exposure to English* and *pop music outside of school.* This analysis clarifies whether any observed MWUs gains can be directly linked to the intervention rather than to external influences. In addition to statistical significance testing, the analysis incorporates effect size calculations using Cohen's *d* to quantify within-group learning gains and examine MWUs retention over time. Effect sizes provide a measure of the practical significance of the intervention, independent of statistical significance.

To assess the broader influence of independent variables, a MANCOVA was employed to evaluate whether predictor variables collectively contribute to differences across MWUs measures. Unlike the between-subjects effects analysis, which examines each factor separately, the multivariate test captures potential interactions between dependent variables, offering a more comprehensive understanding of the intervention's overall impact. To refine the interpretation of group differences further, contrast analysis using the K matrix is applied to compare specific subgroup performances at different time points. This approach allows for the identification of intervention effects that may not be immediately apparent in broader multivariate tests by isolating pairwise differences.

Beyond examining primary intervention effects, the analysis also explored individual learner differences, specifically self-perceived learning engagement and musical preferences, to determine whether subjective factors played a role in MWU learning beyond group assignment.

By structuring the statistical analysis in a progressive and systematic manner—from descriptive statistics to inferential analyses—this section ensured a rigorous evaluation of the intervention's effects. The stepwise approach enhances the validity of the findings by considering both direct intervention effects and individual differences in learning strategies. Furthermore, it provides a nuanced understanding of how a music-based approach to MWU learning interacts with cognitive and affective factors, allowing for conclusions grounded in empirical evidence that consider both direct and indirect influences.

5.4.1.1 Between-Subjects Comparisons

Before analyzing the impact of the intervention, it is crucial to examine the distribution of participants across groups to ensure the validity of subsequent statistical comparisons. A well-balanced sample minimized the risk of bias and ensures that any observed differences in MWU learning can be attributed to the intervention rather

than pre-existing group disparities. Therefore, establishing the comparability of the test (music-based) and control (non-music-based) groups is a fundamental prerequisite for meaningful statistical inferences. Table 31 presents an overview of the between-subjects factors, specifically the distribution of participants across the control and test groups.

Table 31. *Between-Subjects Factors*

Between-subjects factors			
		Value label	N
Group	0	Control	105
	1	Test	107

A relatively balanced sample size (105 in the control group, 107 in the test group) ensures comparability, which is fundamental for meaningful statistical inferences. The next section reports the descriptive statistics for the dependent variables, followed by inferential analyses (MANCOVA).

5.4.1.2 Descriptive Statistics

Before conducting inferential analyses, it was essential to examine the distribution of the study's dependent variables. This section presents descriptive statistics for MWUs scores at three time points (T0, T1, and T2) in both the test and control groups. The primary goal is to summarize central tendencies (means) and variability (standard deviations), providing an initial overview of how receptive and productive knowledge of MWUs evolved over time.

Descriptive statistics served as a preliminary step in the analysis, allowing for the identification of potential trends and group differences before conducting further exploratory analyses. This examination is essential for assessing whether noticeable differences emerged between groups prior to the intervention and for detecting general patterns in MWUs development following the intervention. Additionally, summarizing these measures provides insight into the dataset's variability, ensuring that subsequent analyses account for any potential discrepancies.

Table 32 presents the means and standard deviations for the logit-transformed MWU scores at T0, T1, and T2 in both groups. These values indicate how receptive and productive knowledge of MWUs evolved over time within each group.

Table 32. *Descriptive Statistics of Logit-Transformed MWU Scores Across Test and Control Groups*

Descriptive statistics				
	Group	Mean	Std. deviation	N
T0 after logit transformation	Control	-1,553	2,487	105
	Test	-2,121	3,256	107
	Total	-1,841	2,909	212
T1 after logit transformation	Control	-0,15	2,164	105
	Test	-0,077	2,689	107
	Total	-0,113	2,439	212
T2 after logit transformation	Control	-0,217	2,165	105
	Test	0,067	2,202	107
	Total	-0,073	2,183	212

Note. All numerical values have been rounded to three decimal places for readability, following standard academic reporting conventions. Original calculations were performed using SPSS, which provided higher precision.

The interpretation of the descriptive statistics reveals notable trends in MWUs knowledge across the three measurement points. At T0, the control group had a mean of -1.5534 (*SD* = 2.48695), while the test group showed a slightly lower mean of -2.1206 (*SD* = 3.25557). These values indicate that, before the intervention, the test group started with marginally lower MWUs knowledge compared to the control group. Following the intervention, the T1 demonstrated an overall increase in scores for both groups, with means shifting closer to zero. The control group recorded a mean of -0.1498 (*SD* = 2.16394), while the test group had a mean of -0.0768 (*SD* = 2.68855). Although both groups showed improvement, the difference between them remained minimal. These preliminary results suggest a positive trend in MWUs knowledge, but further statistical testing is necessary to confirm whether the observed changes are statistically significant. At the T2, the control group's mean was -0.2168 (*SD* = 2.16464), whereas the test group exhibited a slight positive shift, with a mean of 0.0674 (*SD* = 2.20178). This suggests that the test group may have retained more MWUs over time compared to the control group, as evidenced by their positive mean value at T2.

Overall, while both groups demonstrated improvement in MWUs knowledge across time points, the test group exhibited a slightly stronger trend toward positive

mean values, particularly at T2. However, these descriptive trends alone do not establish statistical significance. Further inferential analyses are required to determine whether the differences observed between groups are meaningful and attributable to the intervention.

5.4.1.3 Between-Subjects Effects Analysis

To assess the impact of vocal training with English pop songs on MWU learning, a between-subjects effects analysis was conducted. This analysis examines whether the intervention (Group: Test vs. Control) resulted in significant differences in MWU learning while accounting for covariates such as *prior English MWUs knowledge* (*T0 PK*, *T0 RK*), *gender*, *L1/ bilingualism, exposure to English* and *pop songs outside of school*, and *musical training*. The primary objective is to determine whether the test group demonstrated superior MWU learning over time compared to the control group. The results of this analysis are summarized in Table 33.

Table 33. *Tests of Between-Subjects Effects: Multi-Word Unit Learning Outcomes*

Tests of between-subjects effects							
Source	Dependent variable	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared
Corrected model	T0 after logit transformation	1514,981[a]	8	189,373	145,727	0,000	0,852
	T1 after logit transformation	348,017[b]	8	43,502	9,755	0,000	0,279
	T2 after logit transformation	209,781[c]	8	26,223	6,697	0,000	0,210
Intercept	T0 after logit transformation	22,675	1	22,675	17,449	0,000	0,080
	T1 after logit transformation	21,565	1	21,565	4,836	0,029	0,023
	T2 after logit transformation	8,890	1	8,890	2,270	0,133	0,011
T0 RK	T0 after logit transformation	793,861	1	793,861	610,898	0,000	0,752
	T1 after logit transformation	81,477	1	81,477	18,271	0,000	0,083

Tests of between-subjects effects							
	T2 after logit trans-formation	42,359	1	42,359	10,818	0,001	0,051
T0 PK	T0 after logit trans-formation	212,873	1	212,873	163,812	0,000	0,448
	T1 after logit trans-formation	94,552	1	94,552	21,203	0,000	0,095
	T2 after logit trans-formation	75,133	1	75,133	19,188	0,000	0,087
Gender	T0 after logit trans-formation	1,762	1	1,762	1,356	0,246	0,007
	T1 after logit trans-formation	2,344	1	2,344	0,526	0,469	0,003
	T2 after logit trans-formation	0,569	1	0,569	0,145	0,704	0,001
L1/ bilingualism	T0 after logit trans-formation	1,007	1	1,007	0,775	0,380	0,004
	T1 after logit trans-formation	9,378	1	9,378	2,103	0,149	0,010
	T2 after logit trans-formation	0,037	1	0,037	0,010	0,922	0,000
Exposure to English	T0 after logit trans-formation	0,147	1	0,147	0,113	0,737	0,001
	T1 after logit trans-formation	3,725	1	3,725	0,835	0,362	0,004
	T2 after logit trans-formation	0,573	1	0,573	0,146	0,702	0,001
Exposure to pop songs	T0 after logit trans-formation	0,975	1	0,975	0,750	0,388	0,004
	T1 after logit trans-formation	5,977	1	5,977	1,340	0,248	0,007
	T2 after logit trans-formation	7,796	1	7,796	1,991	0,160	0,010
Musical training	T0 after logit trans-formation	2,952	1	2,952	2,271	0,133	0,011
	T1 after logit trans-formation	0,155	1	0,155	0,035	0,852	0,000

Tests of between-subjects effects							
	T2 after logit transformation	0,266	1	0,266	0,068	0,795	0,000
Group	T0 after logit transformation	0,733	1	0,733	0,564	0,453	0,003
	T1 after logit transformation	3,829	1	3,829	0,859	0,355	0,004
	T2 after logit transformation	9,201	1	9,201	2,350	0,127	0,011
Error	T0 after logit transformation	262,499	202	1,299			
	T1 after logit transformation	900,777	202	4,459			
	T2 after logit transformation	790,975	202	3,916			
Total	T0 after logit transformation	2492,641	211				
	T1 after logit transformation	1251,477	211				
	T2 after logit transformation	1001,871	211				
Corrected total	T0 after logit transformation	1777,480	210				
	T1 after logit transformation	1248,793	210				
	T2 after logit transformation	1000,755	210				
a. R squared= ,852 (adjusted R squared = ,846)							
b. R squared= ,279 (adjusted R squared = ,250)							
c. R squared= ,210 (adjusted R squared = ,178)							

The corrected model for T0 after logit transformation explains a substantial proportion of the variance, with an adjusted R^2 of 0.846 ($F = 145.727$, $p < .001$). This indicates that 84.6% of the variance in T0 is accounted for by the predictors, confirming that the model strongly explains initial MWUs knowledge differences. Similarly, the corrected models for T1 ($R^2 = 0.250$, $F = 9.755$, $p < .001$) and T2 ($R^2 =$

0.178, $F = 6.697$, $p < .001$) suggest that predictors continue to explain post-intervention MWUs knowledge but with decreasing effect sizes over time.

Prior English MWUs knowledge (*T0 PK* and *T0 RK*) was the strongest predictor of performance across all time points. For T0, *T0 RK* ($F = 610.898$, $p < .001$, partial $\eta^2 = .752$) and *T0 PK* ($F = 163.812$, $p < .001$, partial $\eta^2 = .448$) demonstrated highly significant effects, indicating that participants' prior English MWUs knowledge strongly influenced their baseline scores. These effects persisted at T1 ($F = 18.271$, $p < .001$, partial $\eta^2 = .083$ for *T0 RK*; $F = 21.203$, $p < .001$, partial $\eta^2 = .095$ at *T0 PK*) and T2 ($F = 10.818$, $p = .001$, partial $\eta^2 = .051$ at *T0 RK*; $F = 19.188$, $p < .001$, partial $\eta^2 = .087$ at *T0 PK*).

The primary variable of interest, *Group* (Test vs. Control), did not yield statistically significant results at any time point. At T0, the F-value was 0.564 ($p = .453$, partial $\eta^2 = .003$), confirming that the two groups had comparable baseline scores. Similarly, at T1 ($F = 0.859$, $p = .355$, partial $\eta^2 = .004$) and T2 ($F = 2.350$, $p = .127$, partial $\eta^2 = .011$), the group factor remained non-significant. These results indicate that the intervention did not lead to statistically significant differences between the test and control groups in terms of MWUs gains.

Gender, *bilingualism*, and *exposure to English outside school* did not exhibit any significant influence on MWU learning at any measurement point, as all p-values exceeded .05. Similarly, *exposure to pop songs outside school* showed a weak effect at T2 ($F = 1.991$, $p = .160$, partial $\eta^2 = .010$); however, this result did not reach statistical significance. Additionally, *musical training* had no meaningful impact on MWU learning, with p-values of .133 at T0, .852 at T1, and .795 at T2.

Summing up, the between-subjects effects analysis confirms that *prior English MWUs knowledge* (*T0 PK*, *T0 RK*) was the most influential predictor of MWU learning outcomes, while the intervention (*group assignment*) did not yield statistically significant effects at T1 or T2. Furthermore, other covariates, including *gender*, *L1/bilingualism*, and *exposure to English* or *pop songs outside school*, had no significant impact on MWU learning outcomes.

To provide a more intuitive understanding of MWUs score distributions across groups, Figures 38-40 present boxplots for T0, T1, and T2. These visualizations complement the statistical findings by illustrating the central tendency, variability, and presence of potential outliers in the dataset.

Figure 38. *Boxplot of Multi-Word Unit Scores (T0) for Test and Control Groups*

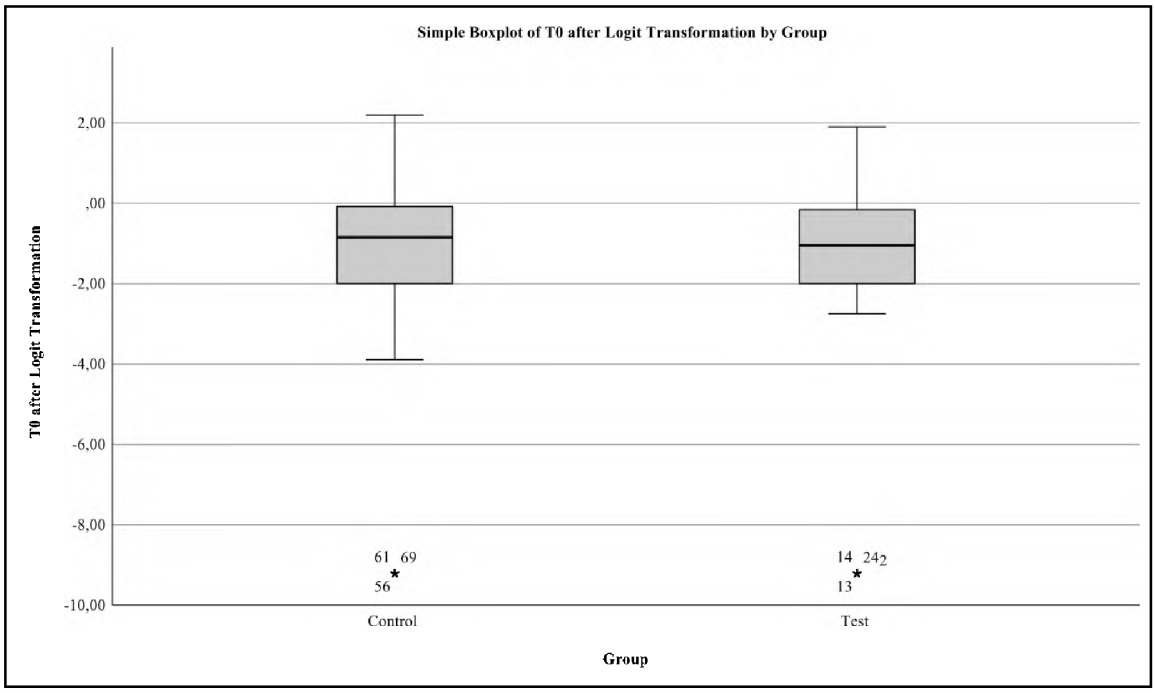


Figure 39. *Boxplot of Multi-Word Unit Scores (T1) for Test and Control Groups*

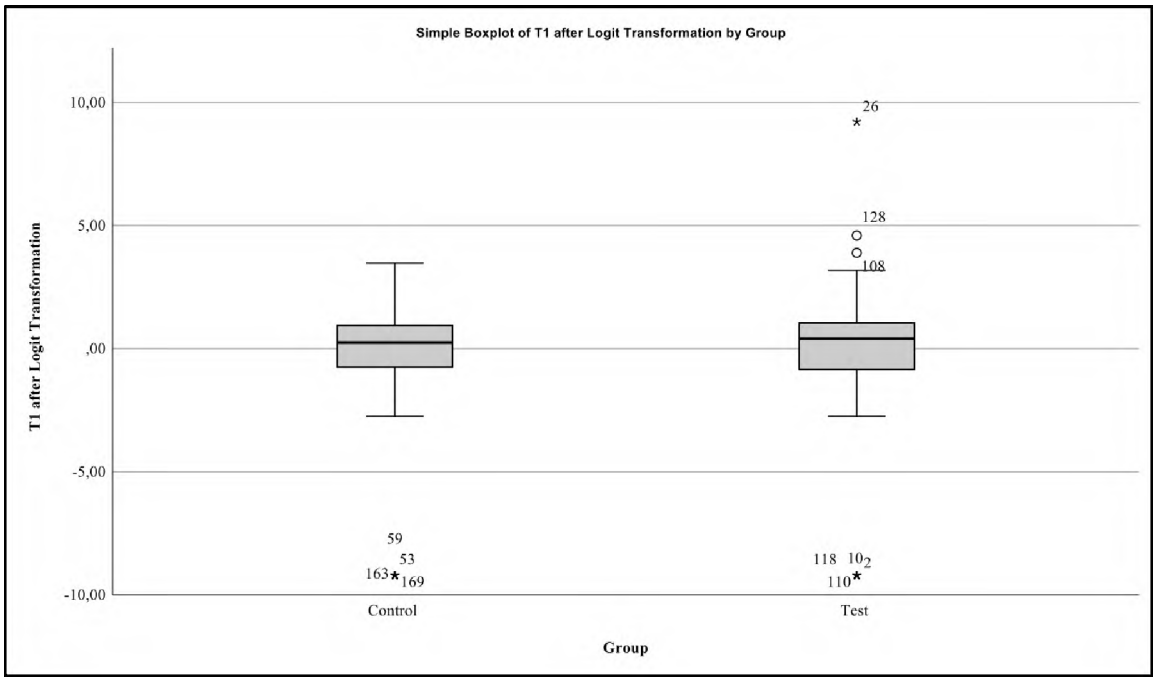
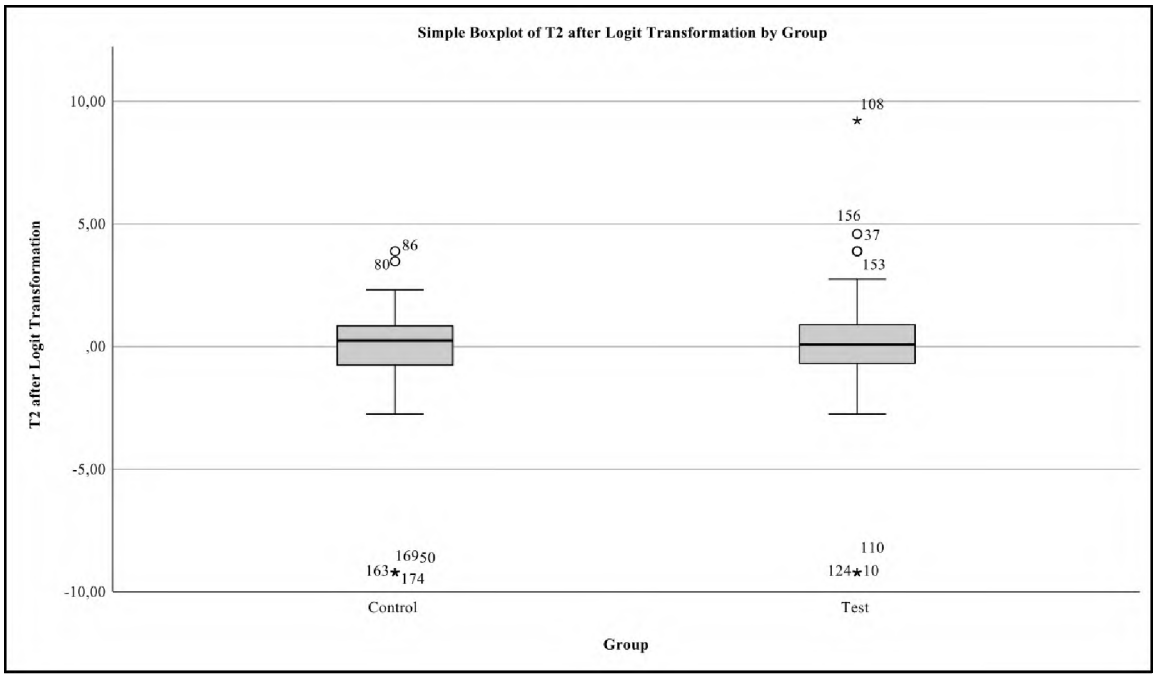


Figure 40. *Boxplot of Multi-Word Unit Scores (T2) for Test and Control Groups*



As shown in Figure 38, the median values and interquartile ranges for T0 are similar between the test and control groups, confirming that participants had comparable baseline before the intervention. Figures 39 and 40 display post-intervention score distributions at T1 and T2, respectively, where slight differences between groups are visible. However, these differences did not reach statistical significance, which aligns with the results of the between-subjects effects analysis. By visually summarizing the data, these figures reinforce the statistical findings and provide additional context for understanding the intervention's effects over time.

5.4.1.4 Calculation of Effect Sizes for Test and Control Groups

To systematically evaluate the impact of the intervention on MWU learning, this following section calculated Cohen's *d* for both the test and control groups at T1 and T2. These effect size calculations quantify within-group learning gains and enable direct comparison with the first study, offering valuable insights into the intervention's effectiveness over time.

Cohen's *d* is computed using the standard formula (Figure 41), where *Mpre* and *Mpost* represent the mean scores of the test group at different time points, and *SDpooled* is the pooled standard deviation (Figure 42). This calculation provides a precise measure of the magnitude of MWUs gains following the intervention.

Figure 41. *Cohen's d Formula*

$$d = \frac{M_{post} - M_{pre}}{SD_{pooled}}$$

Figure 42. *Formula for Pooled Standard Deviation*

$$SD_{pooled} = \sqrt{\frac{(SD_{pre}^2 + SD_{post}^2)}{2}}$$

Figure 43. *Effect Size (Cohen's d) for T0 vs. T1 in the Test Group*

$$d_{T0-T1} = \frac{(-0.0768) - (-2.1206)}{\sqrt{(3.25557^2 + 2.68855^2)/2}} = 0.685$$

Figure 44. *Effect Size (Cohen's d) for T0 vs. T2 in the Test Group*

$$d_{T0-T2} = \frac{(0.0674) - (-2.1206)}{\sqrt{(3.25557^2 + 2.20178^2)/2}} = 0.787$$

The effect size for the test group was calculated at both T1 and T2 to evaluate MWUs gains over time (Figure 43 and 44). At T0, the mean MWUs score for the test group was -2.1206 with a standard deviation of 3.25557. Following the intervention, at T1, the mean increased to -0.0768 with a standard deviation of 2.68855, indicating an improvement in MWUs knowledge. By T2, the mean further shifted to

0.0674, with a reduced standard deviation of 2.20178, suggesting some degree of retention and continued progress.

The results indicate a moderate to large effect size, with the T2 showing a slightly larger effect than the T1, suggesting sustained MWUs retention.

Similarly, Cohen's *d* was calculated for the control group at T1 and T2 to assess within-group MWUs gains. Cohen's *d* was computed for both T0 vs. T1 and T0 vs. T2, quantifying the learning gains and allowing for a direct comparison with the test group (Figure 45 and 46).

Figure 45. *Effect Size (Cohen's d) for T0 vs. T1 in the Control Group*

$$d_{T0-T1} = \frac{(-0.1498) - (-1.5534)}{\sqrt{(2.48695^2 + 2.16394^2)/2}} = 0.602$$

Figure 46. *Effect Size (Cohen's d) for T0 vs. T2 in the Control Group*

$$d_{T0-T2} = \frac{(-0.2168) - (-1.5534)}{\sqrt{(2.48695^2 + 2.16464^2)/2}} = 0.573$$

At T0, the control group had a mean score of -1.5534 with a standard deviation of 2.48695. By T1, the mean improved to -0.1498, with a standard deviation of 2.16394, indicating a positive shift in MWU learning. At T2, the mean slightly declined to -0.2168, with a standard deviation of 2.16464, suggesting a modest retention effect. These findings indicate a moderate effect size for the control group, slightly lower than the test group, suggesting that both groups improved over time, but the test group showed stronger long-term retention at T2.

A comparative analysis of effect sizes reveals that the test group exhibited greater MWUs gains with $d = 0.685$ at T1 and $d = 0.787$ at T2 compared to the control group, which had $d = 0.602$ at T1 and $d = 0.573$ at T2. The test group showed sustained MWUs retention, as indicated by the increase in effect size from T1 to T2,

whereas the control group demonstrated a slight decrease in effect size over time. These results align with the first study's reported effect size ($d \approx 0.5$), confirming that vocal training with pop songs contributes to MWU learning with a medium to large effect size.

Summing up, the effect size analysis confirms notable within-group learning gains, with the test group demonstrating stronger MWUs retention at T2 compared to T1. However, as anticipated, inferential statistical analyses revealed no statistically significant differences between the test and control groups. This suggests that while both groups improved, the music-based approach did not produce significantly greater MWUs gains than the non-music-based approach.

5.4.1.5 Multivariate Test Results

The multivariate tests assessed the overall impact of independent variables (*group*, *gender*, *L1/ bilingualism*, *exposure to English* and *pop songs outside school*, and *musical training*) on multiple dependent variables. These dependent variables consist of participant's receptive and productive knowledge of MWUs at different time points, specifically at T0, T1, and T2. Unlike the between-subjects analysis, which examines individual effects separately, these tests determine whether predictor variables collectively contribute to significant differences in MWU learning.

If significant multivariate effects emerge, they suggest that the intervention influenced multiple MWUs dimensions, reinforcing intervention effectiveness. Conversely, non-significant results confirm that neither the intervention nor the covariates had a meaningful overall impact. Including this analysis ensures a comprehensive evaluation of the predictors' combined effects, strengthening the study's statistical rigor and validating the between-subjects findings. Table 34 presents the results of the multivariate tests used to evaluate the significance of the model across all dependent variables.

Table 34. *Multivariate Test Results for Multi-Word Units Learning Outcomes*

Multivariate test results						
	Value	F	Hypothesis df	Error df	Sig.	Partial eta squared
Pillai's trace	0,013	,902[a]	3,000	200,000	0,441	0,013
Wilks' lambda	0,987	,902[a]	3,000	200,000	0,441	0,013
Hotelling's trace	0,014	,902[a]	3,000	200,000	0,441	0,013
Roy's largest root	0,014	,902[a]	3,000	200,000	0,441	0,013

Multivariate test results
a. Exact statistic

The multivariate tests conducted—Pillai's trace, Wilks' lambda, Hotelling's trace, and Roy's largest root—yielded comparable results, all indicating a non-significant effect of the predictors on the combined dependent variables. Specifically, all test statistics produced a p-value of 0.441, exceeding the conventional significance threshold of 0.05. This result suggests that the predictor variables, when analyzed together, do not significantly explain variance across the dependent measures. Furthermore, the partial η^2 value of 0.013 for all tests reflects a very small effect size, implying that the combined predictors account for only a minimal proportion of variance in the outcome variables. These findings reinforce previous results from the between-subjects effects analyses, indicating that the intervention and covariates had limited overall impact on MWU learning.

In conclusion, the multivariate test results confirm that, when assessed collectively, the predictor variables do not significantly influence the combined MWU learning outcomes. These findings align with previous between-subjects analyses, reinforcing the conclusion that individual-level factors-such as s*elf-perceived learning engagement*- play a more prominent role in MWU learning than the intervention itself. Given these results, further analyses, such as contrast tests, are necessary to investigate potential subgroup differences or interaction effects, which could provide additional insight into variability within the dataset.

5.4.1.6 Contrast Results (K Matrix)

Contrast analysis using the K matrix provided a detailed comparison of subgroup performance at different time points (T0, T1, and T2), complementing the broader between-subjects and multivariate analyses. While previous tests assess overall group effects, contrast analysis isolates specific pairwise differences, identifying potential trends that may not be evident in the overall model.

This analysis is particularly valuable for uncovering nuanced differences between the test and control groups, especially when overall multivariate effects are non-significant. Even when contrast tests do not yield statistically significant results, their direction and effect size can reveal meaningful trends in MWU learning. Including these contrasts enhances the interpretation of group-level differences and contributes to a more nuanced understanding of the intervention's impact, offering guidance for future research on music-based approaches in language education. Fig-

ure 35 presents the contrast analysis results, comparing Level 1 (test group) and Level 2 (control group) at each measurement point.

Table 35. *Contrast Results (K Matrix): Multi-Word Unit Scores Across Time Points*

Contrast results (K matrix)					
Group simple contrast[a]			Dependent variable		
			T0 after logit transformation	T1 after logit transformation	T2 after logit transformation
Level 1 vs. level 2	Contrast estimate		-0,120	-0,275	-0,426
	Hypothesized value		0	0	0
	Difference (estimate - hypothesized)		-0,120	-0,275	-0,426
	Std. error		0,160	0,297	0,278
	Sig.		0,453	0,355	0,127
	95% confidence interval for difference	Lower bound	-0,436	-0,860	-0,975
		Upper bound	0,196	0,310	0,122
a. Reference category = 2					

At all three time points (T0, T1, and T2), the contrast estimates were negative, with values of -0.120 at T0, -0.275 at T1, and -0.426 at T2. These estimates represent the difference between the two groups, with zero serving as a neutral benchmark for comparison. The consistently negative values indicate that Level 1 scored lower than Level 2 across all time points. However, none of these differences reached statistical significance. The *p-values* for T0 ($p = 0.453$), T1 ($p = 0.355$), and T2 ($p = 0.127$) all exceed the conventional 0.05 threshold, suggesting that the observed differences are not statistically reliable. Moreover, the 95% confidence intervals for all contrasts include zero, reinforcing the conclusion that there are no statistically significant differences between Level 1 (test group) and Level 2 (control group) at any measurement point.

5.4.1.7 Statistical Analysis of Secondary Predictors

Since the analyses in the previous sections revealed no significant group effects in MWU learning, further investigation was necessary to determine whether individual cognitive and affective factors influenced MWU learning outcomes. This following section therefore shifts the focus to secondary predictors, specifically self-perceived learning engagement and musical preferences, to assess whether subjective learning strategies contribute to MWU learning beyond structural differences between the test and control groups. The results of this extended analysis are summarized in Table 36.

Table 36. *Tests of Between-Subjects Effects: Individual Predictors of Multi-Word Unit Learning*

Tests of between-subjects effects						
Source	Dependent variable	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	T0 after logit trans-formation	175,008[a]	6	29,168	3,731	0,002
	T1 after logit trans-formation	195,823[b]	6	32,637	5,893	0,000
	T2 after logit trans-formation	73,097[c]	6	12,183	2,682	0,016
Intercept	T0 after logit trans-formation	322,130	1	322,130	41,209	0,000
	T1 after logit trans-formation	31,058	1	31,058	5,608	0,019
	T2 after logit trans-formation	22,319	1	22,319	4,913	0,028
Preference for pop music	T0 after logit trans-formation	7,523	1	7,523	0,962	0,328
	T1 after logit trans-formation	4,225	1	4,225	0,763	0,383
	T2 after logit trans-formation	0,342	1	0,342	0,075	0,784
Preference for the selected pop song	T0 after logit trans-formation	0,137	1	0,137	0,018	0,895
	T1 after logit trans-formation	0,197	1	0,197	0,036	0,850

Tests of between-subjects effects						
	T2 after logit trans-formation	4,427	1	4,427	0,974	0,325
Exposure to English outside school	T0 after logit trans-formation	0,010	1	0,010	0,001	0,972
	T1 after logit trans-formation	1,586	1	1,586	0,286	0,593
	T2 after logit trans-formation	0,767	1	0,767	0,169	0,682
Self-perceived song listening comprehension	T0 after logit trans-formation	49,593	1	49,593	6,344	0,013
	T1 after logit trans-formation	94,818	1	94,818	17,121	0,000
	T2 after logit trans-formation	44,048	1	44,048	9,696	0,002
Self-perceived approach effi-cacy	T0 after logit trans-formation	67,656	1	67,656	8,655	0,004
	T1 after logit trans-formation	53,143	1	53,143	9,596	0,002
	T2 after logit trans-formation	18,813	1	18,813	4,141	0,043
Group	T0 after logit trans-formation	23,259	1	23,259	2,975	0,086
	T1 after logit trans-formation	0,480	1	0,480	0,087	0,769
	T2 after logit trans-formation	6,033	1	6,033	1,328	0,250
Error	T0 after logit trans-formation	1602,494	205	7,817		
	T1 after logit trans-formation	1135,344	205	5,538		
	T2 after logit trans-formation	931,326	205	4,543		
Total	T0 after logit trans-formation	2496,611	212			
	T1 after logit trans-formation	1336,305	212			

Tests of between-subjects effects						
	T2 after logit trans-formation	1005,841	212			
Corrected total	T0 after logit trans-formation	1777,502	211			
	T1 after logit trans-formation	1331,167	211			
	T2 after logit trans-formation	1004,423	211			
a. R squared= ,098 (adjusted R squared= ,072)						
b. R squared= ,147 (adjusted R squared= ,122)						
c. R squared= ,073 (adjusted R squared= ,046)						

The corrected model accounts for a smaller proportion of variance than the primary predictors, with adjusted R^2 values of 0.072 at T0, 0.122 at T1, and 0.046 at T2. These values indicate that secondary predictors explain less variance than *prior English MWUs knowledge* (*T0 PK* and *T0 RK*) but still show some significant effects.

Among these predictors, self-perceived learning factors appear to play a notable role: *Self-perceived song listening comprehension* significantly impacted MWU learning across all time points, with statistical significance observed at T0 ($F = 6.344$, $p = .013$), T1 ($F = 17.121$, $p < .001$), and T2 ($F = 9.696$, $p = .002$). Similarly, *self-perceived approach efficacy* also showed significant effects, with results at T0 ($F = 8.655$, $p = .004$), T1 ($F = 9.596$, $p = .002$), and T2 ($F = 4.141$, $p = .043$). These findings suggest that students' self-perceived engagement and learning strategies may have played a meaningful role in their MWUs retention over time.

In contrast, musical preference and song selection did not yield significant results. Neither *preference for pop music* nor *preference for the selected pop song* demonstrated statistical significance at any time point (all p-values > .05), indicating that individual musical preferences alone did not directly influence MWU learning. Similarly, *exposure to English outside school* did not emerge as a significant predictor, as evidenced by its non-significant effects at T0 ($F = 0.001$, $p = .972$), T1($F = 0.286$, $p = .593$), and T2 ($F = 0.169$, $p = .682$). These results suggest that students' incidental exposure to English beyond the classroom did not substantially affect their MWU learning outcomes.

The *group* variable (test vs. control) was marginally significant at T0 ($F = 2.975$, $p = .086$) but failed to demonstrate meaningful effects at T1 ($F = 0.087$, p

= .769) and T2 (F = 1.328, p = .250). This reinforces the previous findings, confirming that group differences were not statistically significant.

To further illustrate the impact of self-perceived learning engagement, Figures 47-49 present the estimated marginal means for T0, T1, and T2 across groups. Unlike the boxplots in section 5.4.1.3, which emphasized distributional differences, these following figures highlight time-based trends, demonstrating that students with higher self-perceived engagement maintained stronger MWUs retention, irrespective of group assignment.

Figure 47. *Estimated Marginal Means at T0 by Group*

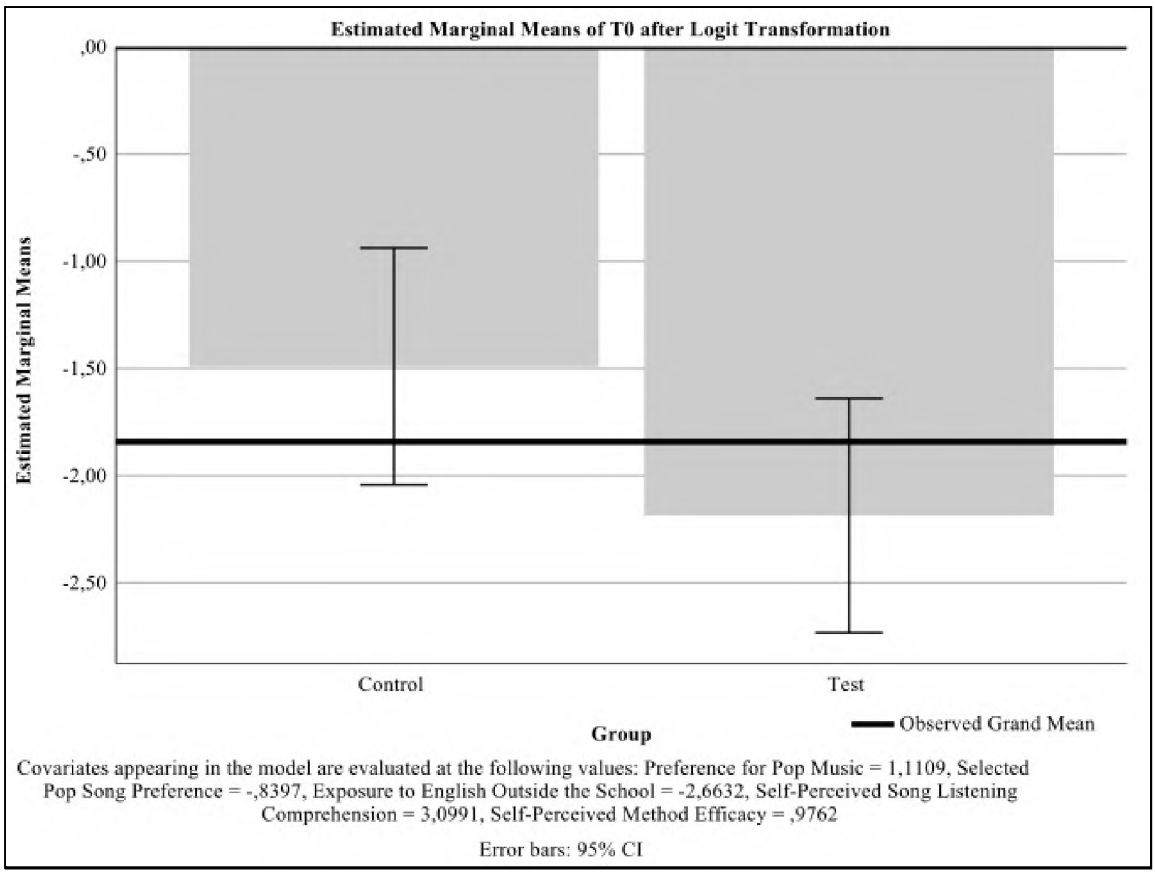


Figure 48. *Estimated Marginal Means at T1 by Group*

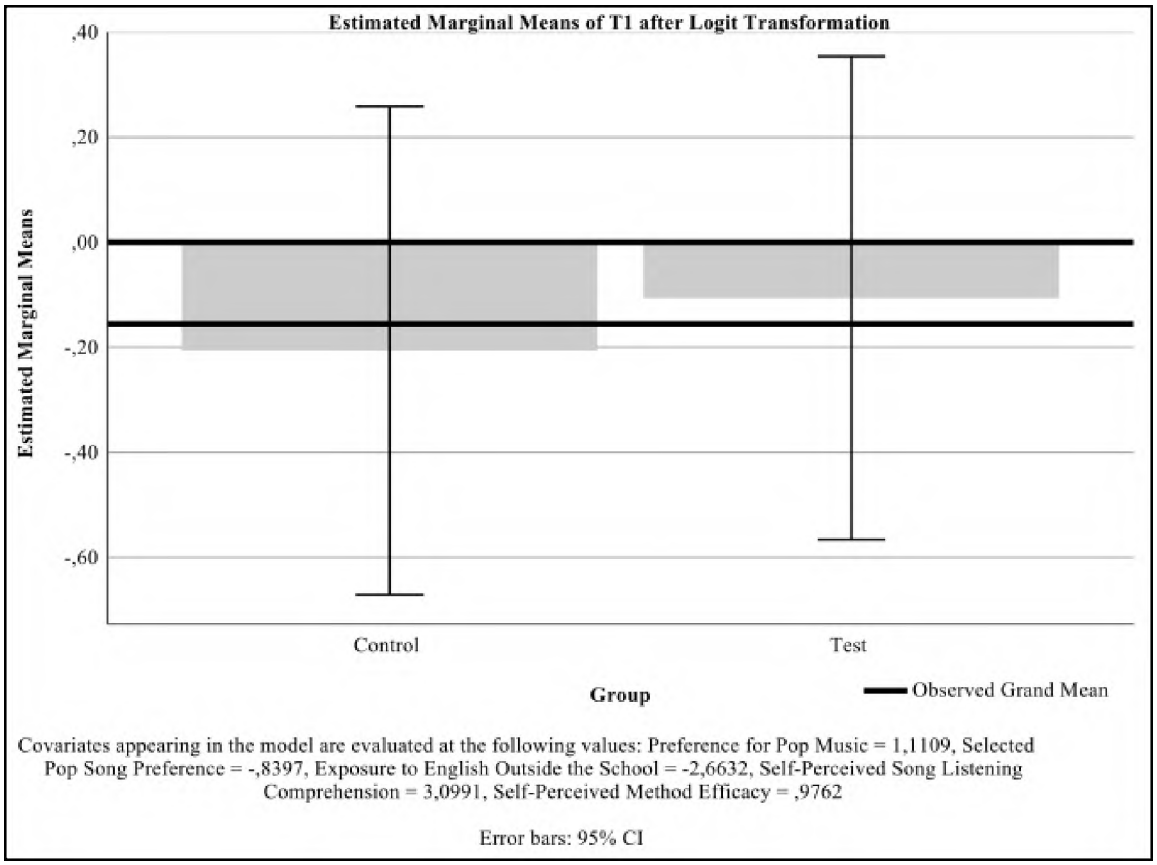
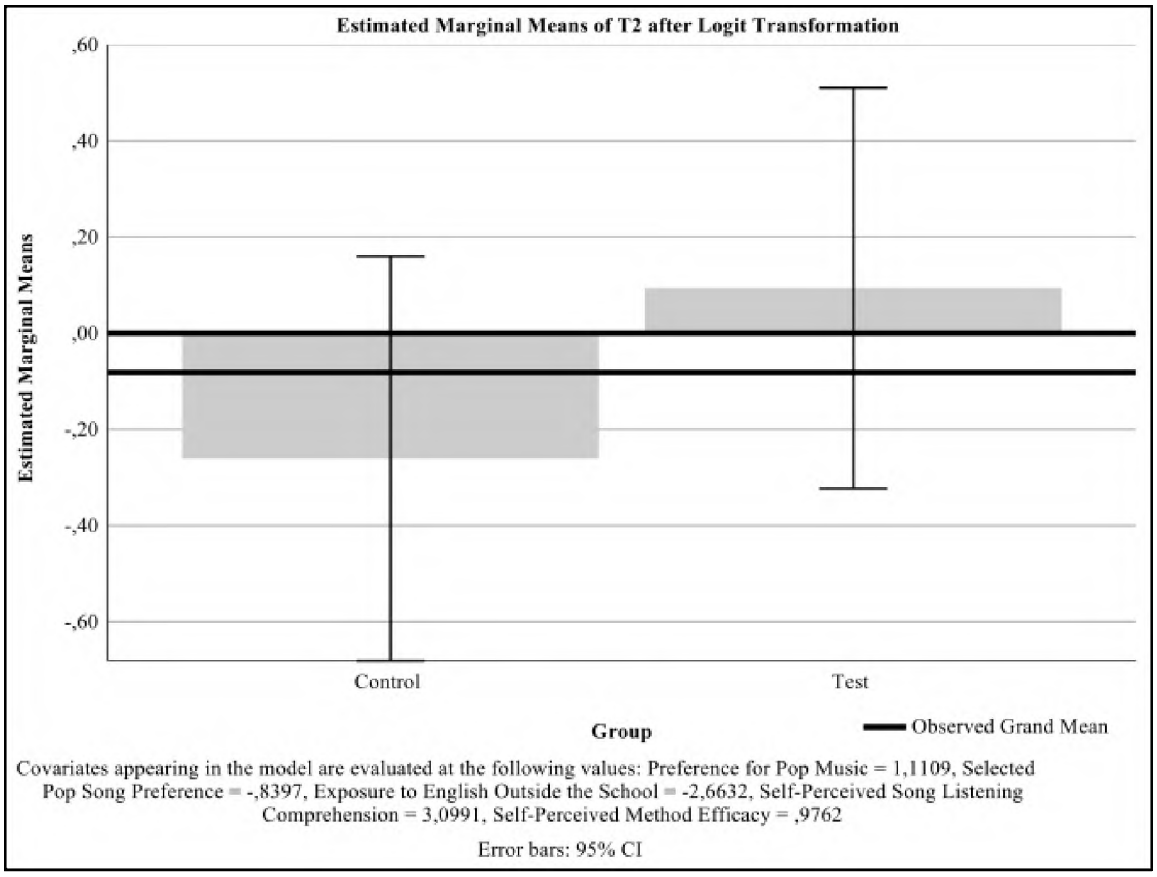


Figure 49. *Estimated Marginal Means at T2 by Group*



As shown in Figure 47, the estimated marginal means at T0 reflect the initial differences in MWUs knowledge, with noticeable variance between participants but no significant difference between groups. Figure 48 presents the estimated means at T1, immediately after the intervention, where minor differences between groups are visible, yet these variations remain statistically non-significant. Similarly, Figure 49 displays the estimated marginal means at T2, indicating that the MWUs retention trends observed in both groups followed a similar trajectory without a significant effect of the intervention.

These graphical representations reinforce the statistical results by highlighting that individual differences, rather than group assignment, contributed more prominently to MWU learning outcomes. Specifically, students who reported higher self-perceived engagement with the learning process (as indicated by *self-perceived song listening comprehension* and *self perceived approach efficacy*) demonstrated greater MWUs retention regardless of their group assignment. Conversely, external factors such as musical preference and exposure to English outside the classroom did not appear to systematically influence MWU learning outcomes. These findings align with self-regulated learning theories in second language acquisition (SLA), which

highlight the role of intrinsic motivation and metacognitive awareness in vocabulary retention (Zimmerman & Schunk, 2011).

5.4.1.8 The Role of Secondary Predictor Variables in Vocabulary Acquisition: Statistical Insights from t-Tests and Correlation Analysis

To further investigate the impact of individual learner characteristics on MWU learning within the intervention, a series of independent *t*-tests were conducted, distinguishing between the test and control groups. Additionally, Pearson correlation analyses were performed within each group to examine the interrelationships between predictor variables and MWU learning outcomes.

Independent *t*-tests revealed that *self-perceived song listening comprehension* ($t = 9.696$, p = .002), *self-perceived approach efficacy* ($t = 9.596$, $p = .002$), *willingness to adopt the approach* ($t = 6.455$, $p < .05$), and *exposure to English music* ($t = 5.607$, $p < .05$) significantly differed between the test and control groups. These findings indicate that learners in the test group demonstrated higher confidence in their ability to understand song lyrics and in the instructional approach itself. Furthermore, they exhibited greater motivation to integrate the music-based learning approach into their vocabulary development and had more prior exposure to English-language music.

Conversely, other variables—including *preference for pop music* ($t = -0.245$, $p > .05$), *perceived music benefits pre-intervention* ($t = -0.205$, $p > .05$), *perceived music benefits post-intervention* ($t = -4.913$, $p < .05$), INMI ($t = 0.440$, $p > .05$), *selected pop song preference* ($t = 0.004$, $p > .05$), and *well-being* ($t = 2.078$, $p > .05$)—did not show statistically significant differences between groups. This suggests that mere exposure to or preference for pop music did not systematically impact MWU learning, reinforcing the notion that engagement with the instructional approach, rather than passive musical exposure, was the key determinant.

Pearson correlation analyses provided deeper insights into how secondary variables interacted with MWU learning outcomes, revealing distinct patterns between the test and control groups. In the test group, *self-perceived song listening comprehension* showed a positive correlation with both *T1 RK* ($r = .23$) and *T2 RK* ($r = .21$), suggesting that students who felt confident in understanding song lyrics demonstrated stronger retention of receptive MWUs knowledge over time. Additionally, this variable was correlated with *T1 PK* ($r = .33$), indicating that learners with higher confidence in song comprehension also exhibited some improvement in MWUs productive knowledge. Similarly, *self-perceived approach efficacy* correlated with *T1*

PK (r = .20), implying that students who believed in the effectiveness of the instructional approach were more likely to achieve gains in productive MWU scores.

Another notable finding was the relationship between *willingness to adopt the approach* and MWU learning outcomes. Weak but positive correlations with *T0 RK* and *T1 RK* suggest that students who were more receptive to music-based learning approach tended to have slightly stronger receptive MWUs knowledge. Additionally, *perceived music benefits post-intervention* correlated with *T1 RK* (r = .21), indicating that students who recognized the benefits of music following the intervention exhibited slightly improved receptive MWU learning.

By contrast, in the control group, these correlations were considerably weaker. *Self-perceived song listening comprehension*, *self-perceived approach efficacy*, and *willingness to adopt the approach* showed negligible associations with MWUs measures, suggesting that without the music-based approach, these variables had little impact on MWU learning. Similarly, *exposure to English music* did not correlate significantly with MWU learning, reinforcing the idea that passive exposure alone does not contribute to retention. Moreover, *well-being* exhibited no significant relationship with MWU learning in either group, indicating that well-being, in isolation, was not a key predictor of MWU learning outcomes.

Summing up, the findings suggest that confidence in song comprehension and belief in the instructional approach played a substantial role in MWU learning, particularly in the test group. Furthermore, the strong correlation between *self-perceived song listening comprehension* and *T1 RK* and *T2 RK* supports the hypothesis that learners who feel more confident in processing lyrics can focus more on semantic retention rather than decoding, reducing cognitive load (Calvert & Billingsley, 1998; Medina, 2002; Racette & Peretz, 2007). In contrast, the lack of significant correlations in the control group indicates that without the music-based approach, these predictors had little impact on MWU learning.

5.4.1.9 Answer to RQ1

The statistical analyses for RQ1 aimed to determine to what extent vocal training with English pop songs enhances receptive and productive knowledge of MWUs in lower secondary EFL context compared to a non-music-based approach. Given the findings of the statistical analyses, the following section critically evaluates the intervention's impact, focusing on both immediate MWUs gains and their long-term retention. It examines effect sizes, between-group comparisons, and key predictors of learning outcomes, offering a nuanced assessment of the music-based approach's effectiveness in comparison with the non-music-based approach.

The test group exhibited notable MWUs gains, with effect sizes falling within the medium-to-large range. Specifically, for receptive knowledge, the test group's mean score improved from M = -2.1206 (SD = 3.25557) at T0 to M = -0.0768 (SD = 2.68855) at T1, demonstrating a significant increase in receptive MWUs knowledge immediately after the intervention. This resulted in an effect size of Cohen's d = 0.685, indicating a moderate-to-large impact of the music-based approach. By T2, the mean score further increased to M = 0.0674 (SD = 2.20178), with Cohen's d rising to 0.787, suggesting that the receptive vocabulary gains were not only maintained but slightly enhanced over time. For productive knowledge, a similar pattern was observed. The test group's productive vocabulary mean score increased from M = -2.1206 (SD = 3.25557) at T0 to M = -0.0768 (SD = 2.68855) at T1, yielding a Cohen's d of 0.685. By T2, productive knowledge scores showed a slight positive shift, suggesting that the test group demonstrated greater gains in productive MWUs than the control group, though the improvement was more gradual.

On the other hand, while the control group also demonstrated MWUs gains, the overall effect sizes were smaller, and the retention of MWUs knowledge appeared less stable over time. For receptive knowledge, the control group's mean score improved from M = -1.5534 (SD = 2.48695) at T0 to M = -0.1498 (SD = 2.16394) at T1, resulting in an effect size of Cohen's d = 0.602. However, between T1 and T2, the control group's mean score slightly declined to M = -0.2168 (SD = 2.16464), with Cohen's d decreasing to 0.573. For productive knowledge, a similar trend was evident. The control group's productive vocabulary mean score increased between T0 and T1, with a Cohen's d of 0.602, indicating moderate learning gains. However, from T1 to T2, the effect size declined slightly to 0.573.

This finding contrasts with the test group's sustained MWUs gains and suggests that a non-music-based approach to MWU learning may lead to moderate but less durable MWUs gains over time. These results underscore a key distinction between the two approaches: while both groups demonstrated improvements in receptive and productive MWUs knowledge, the test group exhibited stronger retention effects and MWUs consolidation at T2.

A crucial consideration is that the corrected models for T1 and T2 revealed a decline in predictive power, with adjusted R^2 values decreasing from 0.250 at T1 to 0.178 at T2. This decline indicates that while the predictors accounted for a moderate proportion of variance in MWU learning immediately post-intervention, their explanatory power diminished over time.

Moreover, the observed marginal advantage of the test group over the control group cannot be attributed to participants' preference for the selected pop songs. A total of 73.59% (n = 156) of the 212 pupils reported a moderate to high preference

for the songs, suggesting that song preference was not a limiting factor in the effectiveness of the intervention. Specifically, 44.34% (n = 94) of pupils expressed a moderate to high preference, while 29.25% (n = 62) moderately liked the selected songs. In contrast, 16.98% (n = 36) of pupils indicated no preference, and a smaller proportion (9.43%, n = 20) reported a strong liking for the intervention's musical content.

A particularly noteworthy trend is the stronger impact of the intervention on receptive knowledge compared to productive knowledge. The test group not only exhibited a larger effect size for receptive knowledge (Cohen's d = 0.787 at T2) compared to productive knowledge (Cohen's d = 0.641 at T2) but also demonstrated more stable retention over time. While the effect size for receptive knowledge increased from T1 (Cohen's d = 0.685) to T2 (Cohen's d = 0.787), indicating continued retention and slight improvement, the effect size for productive knowledge showed a smaller increase (Cohen's d = 0.594 at T1 to Cohen's d = 0.641 at T2). This suggests that the music-based approach may have been particularly beneficial for reinforcing receptive MWUs knowledge.

To contextualize these findings, it is essential to examine them within the framework of established effect size conventions and prior research on a music-based vocabulary learning approach. According to Cohen's (1988) classification, effect sizes of 0.20 are considered small, 0.50 medium, and 0.80 large. The test group's effect sizes (0.685 at T1, 0.787 at T2) indicate a moderate-to-large impact, reinforcing the pedagogical value of the approach. This interpretation is consistent with Hedges and Olkin (1985) and aligns with Glass et al. (1981), who classified 0.50 as a large effect in social sciences. In the educational context, Hattie's (2009, 2012, 2015) meta-analyses set 0.40 as the average effect size for instructional interventions, while Marzano (1998, 2003) reported 0.42 for teaching strategies. The observed effect sizes of the current study exceed these benchmarks, supporting the efficacy of music-based approaches in vocabulary learning. Similarly, Kraft (2020) redefined 0.20 as a large effect in education, further validating the intervention's impact.

Despite these effect size conventions, direct comparisons with previous research remain challenging, as previous studies on a music-based vocabulary learning report qualitative benefits but lack precise effect size estimates (Medina, 1990; Hahn, 1972; Legg, 2009; Salas, 2006; Good et al., 2015). This gap hinders meta-analytical assessments and the establishment of clear empirical standards. By providing standardized effect size measures, this study—alongside the first study—addresses this limitation, offering quantifiable evidence of the impact of music-based vocabulary approach and establishing a reference point for future research.

Notably, while the effect sizes indicate MWUs gains in both the test and control groups, the between-group comparisons did not reach statistical significance. At

T0, the test group had a slightly lower overall MWUs score (M = -2.1206, SD = 3.25557) compared to the control group (M = -1.5534, SD = 2.48695). Moreover, in the test group, productive knowledge at T0 was lower (M = -2.4763, SD = 3.41218) than receptive knowledge (M = -1.7650, SD = 3.09364). A similar pattern was observed in the control group, where receptive knowledge (M = -1.2711, SD = 2.37578) exceeded productive knowledge (M = -1.8357, SD = 2.59812). These values indicate that both groups had comparable baseline proficiency of English MWUs knowledge, with slightly stronger receptive knowledge than productive knowledge.

At T1, both groups demonstrated gains in receptive and productive MWUs knowledge. The test group's receptive knowledge score improved to M = -0.0768, SD = 2.68855, while the control group's score increased to M = -0.1498, SD = 2.16394. However, the between-group difference remained statistically non-significant (F = 0.087, p = 0.769). Similarly, in productive knowledge, the test group improved from M = -2.1206 to M = -0.0768, with a moderate-to-large effect size (Cohen's d = 0.685). The control group also showed gains (M = -1.5534 to M = -0.1498), though with a smaller effect size (Cohen's d = 0.602).

At T2, the test group showed further improvement, reaching a positive mean score (M = 0.0674, SD = 2.20178), while the control group slightly declined (M = -0.2168, SD = 2.16464). The test group retained most of its productive MWUs gains, whereas the control group exhibited weaker retention, particularly in productive knowledge. Despite these trends, the between-group difference remained statistically non-significant (F = 1.328, p = 0.250).

Multivariate tests further confirmed the lack of significant differences between groups. Wilks' Lambda, Pillai's Trace, Hotelling's Trace, and Roy's Largest Root all yielded non-significant results (p = 0.441). Additionally, contrast analysis using the K matrix showed that contrast estimates remained negative across all time points (-0.120 at T0,-0.275 at T1, -0.426 at T2) but were non-significant ($p > 0.05$). These findings indicate that no substantial differences emerged between groups over time, reinforcing that while the music-based approach contributed to MWU learning, its effects were not significantly different than those of the non-music-based approach.

The findings of this study are consistent with previous research indicating no significant differences between music-based and non-music-based approaches for vocabulary learning (Medina, 1990; Ludke, 2010; Rukholm et al., 2018; Tegge, 2015, 2017) or only minor advantages for music-based approaches (Pavia et al., 2019).

On the other hand, some studies have reported positive effects of music-based interventions; however, these findings often stem from relatively small sample sizes,

raising concerns about their generalizability. For example, Hahn (1972) observed improved vocabulary learning outcomes using qualitative questionnaires, but the study included only 38 pupils. Similarly, Luo (2019) conducted a single 40-minute session with just 15 senior high school students, relying on interview data. Good et al. (2015) also reported better recall, pronunciation, and translation test results for the test group, yet their study was based on a sample of only 28 pupils. Legg (2009) and Salcedo (2010) observed short-term benefits but these gains did not translate into long-term vocabulary retention, reinforcing the mixed evidence regarding the effectiveness of music-based interventions.

Beyond sample size considerations, differences in interventions duration have also influenced reported outcomes. While Legg (2009) found that music improved short-term vocabulary learning, studies have demonstrated stronger vocabulary retention only after extensive intervention. For instance, Köksal et al. (2013) reported significant vocabulary gains following a 12-week intervention, while Javadi-Safa (2018) found that a 20-week intervention led to superior performance in vocabulary scores. Similarly, Yousefi et al. (2014) observed enhanced learning outcomes in a two-month study with junior high school girls highlighting the potential benefits of extended exposure to music-based approach.

In addition to intervention duration, the choice of assessment measures has played a critical role in shaping reported findings. Some studies have relied only on immediate post-tests to evaluate vocabulary gains, while others have incorporated delayed post-tests to assess long-term retention.

Beyond differences in sample sizes, intervention duration and assessment measures, methodological approaches significantly influence research findings. Studies vary in their choice of assessment tools, ranging from self-developed tests to standardized vocabulary measures. Indeed, some researchers have employed self-designed assessments integrating multiple-choice, true/false, and short-answer formats (Javadi-Safa, 2018; Luo, 2019), while others have utilized standardized instruments such as the Vocabulary Knowledge Scale and Vocabulary Level Test. Additionally, several studies have relied on qualitative self-reports to evaluate vocabulary gains (Castro Huertas & Navarro Parra, 2014; Hahn, 1972; Kuśnierek, 2016; Medina, 1990).

Taken together, these findings highlight the complexity of evaluating music-based approaches for vocabulary learning. While some studies report measurable benefits, variations in sample size, intervention length, and assessment methods contribute to inconsistencies in results and challenge in comparisons.

The absence of statistically significant differences between the test and control groups may be likely attributed to the short duration of the intervention. Research on

vocabulary acquisition underscores the necessity of extended intervention programs to achieve substantial and lasting learning gains. Studies with longer durations have consistently demonstrated stronger vocabulary retention, emphasizing the importance of sustained exposure. Bygrave (1995) reported significant vocabulary improvements only after a 30-week intervention, while Javadi-Safa (2018) and Heidari & Araghi (2015) found greater effects in programs lasting 20 and 17 weeks, respectively. Similarly, Hahn (1972) and Abidin et al. (2011) observed positive outcomes in six-week programs, and Köksal et al. (2013) identified notable gains following a twelve-week intervention. Similarly, Moreno et al. (2011) documented significant vocabulary gains after a 20-day music training program with preschoolers, while Ludke (2010) found that at least four weeks are necessary to achieve measurable improvements in vocabulary knowledge.

Beyond intervention length, research consistently highlights that vocabulary retention is most effective when exposure is distributed over an extended period rather than condensed into a short timeframe (Harry et al., 1993; Ludke, 2010; Medina, 1990; Rukholm et al., 2018; Webb & Chang, 2012a; Webb & Nation, 2017).

Moreover, vocabulary learning occurs incrementally, requiring repeated exposure to linguistic input for consolidation and retention (Nagy et al., 1985; Webb & Chang, 2015a). Unlike one-time exposure, which may not be sufficient for long-term retention, consistent encounters with new vocabulary across multiple learning sessions reinforce memory traces and strengthen retrieval pathways. Indeed, frequent encounters with target MWUs across multiple lessons have been found to enhance retention (Horst & Meara, 1999; Penno et al., 2002; Webb & Chang, 2012a). Moreover, spaced repetition, where vocabulary is revisited systematically over time, enhances learning efficiency and supports the gradual integration of new vocabulary into long-term memory. Furthermore, learners with less prior vocabulary knowledge require more frequent exposure to new vocabulary to support effective learning (Penno et al., 2002; Peters et al., 2016; Vidal, 2003; Webb & Chang, 2015a). Given their limited vocabulary foundation, repeated exposure played a crucial role in strengthening semantic connections and enhancing vocabulary retention.

The absence of statistically significant differences between the test and control groups may also be attributed to cognitive processing demands of the music-based approach. The dual-task nature of simultaneously reading lyrics while singing and reaching accurate pitch could have imposed cognitive overload (Calvert & Billingsley, 1998; Racette & Peretz, 2007), potentially limiting the intervention's effectiveness of the music-based approach. Research suggests that the simultaneous processing of musical and linguistic input can sometimes hinder rather than facilitate vocabulary acquisition, particularly when learners are unfamiliar with the musical

material (Coyle & Gómez Gracia, 2014; Purnell-Webb & Speelman, 2008; Wallace, 1994). Moreover, the participants' unfamiliarity with the music-based approach, compared to the well-established approach of reciting stories, texts, and poems in the school context, may have contributed to the test group's lack of outperformance.

While these factors may explain the absence of the statistically significant difference between the test and control groups, the further analyses also highlighted key variables influencing MWU learning. *Prior English MWUs knowledge*—both recepetive and productive knowledge (*T0 RK* and *T0 PK*)—emerged as the strongest predictors of MWU learning outcomes across all time points. For instance, T0 receptive knowledge ($F = 610.898$, $p < 0.001$, partial $\eta^2 = 0.752$) and T0 productive knowledge ($F = 163.812$, $p < 0.001$, partial $\eta^2 = 0.448$) accounted for the majority of variance in T1 and T2 scores. This highlights the critical role of *prior English MWUs knowledge* for future research. In contrast, other covariates, such as *gender*, *L1/bilingualism*, *exposure to English*, *musical training* and *exposure to pop songs*, showed minimal impact, as indicated by their non significant *p*-values.

Moroever, the between-subjects effects analysis identified *self-perceived song listening comprehension* and *self-perceived approach efficacy* as a significant predictors of MWU learning. Specifically, *self-perceived song listening comprehension* ($F = 17.121$, $p < .001$ at T1; $F = 9.696$, $p = .002$ at T2) and *self-perceived approach efficacy* ($F = 9.596$, $p = .002$) exhibited statistically significant effects across all time points, indicating that learners who felt confident in their capacity to understand song lyrics and believed in the effectiveness of the instructional approach demonstrated greater MWU learning. These findings align with self-regulated learning theories (Zimmerman & Schunk, 2011), emphasizing the importance of metacognitive awareness and learner agency in language learning. The results also reinforce prior research on the role of active learner engagement in musical interventions (Ludke et al., 2014; Salcedo, 2010).

A deeper statistical analysis between the test and control groups revealed key differences in the way the secondary variables interacted with MWU learning. Independent *t*-tests demonstrated that learners in the test group exhibited significantly higher *self-perceived song listening comprehension* ($t = 9.696$, $p = .002$), *self-perceived approach efficacy* ($t = 9.596$, $p = .002$), *willingness to adopt the approach* ($t = 6.455$, $p < .05$), and *exposure to English music* ($t = 5.607$, $p < .05$) compared to the control group. Conversely, other variables-including *preference for pop music* ($t = -0.245$, $p > .05$), *perceived music benefits pre-intervention* ($t = -0.205$, $p > .05$), *perceived music benefits post-intervention* ($t = -4.913$, $p < .05$), INMI ($t = 0.440$, $p > .05$), *selected pop song preference* ($t = 0.004$, $p > .05$), and *well-being* ($t = 2.078$, $p > .05$) did not differ significantly between the test and control groups. These findings rein-

force the conclusion that engagement and confidence in the instructional approach, along with self-perceived song listening comprehension, are predictors of MWU learning.

Pearson correlation analyses provided deeper insights into the interaction between secondary predictor variables and MWU learning outcomes, revealing distinct patterns between the test and control groups. In the test group, *self-perceived song listening comprehension* was positively correlated with *T1 RK* (r = .23) and *T2 RK* (r = .21), suggesting that students who felt confident in understanding song lyrics demonstrated stronger gains in receptive MWUs knowledge over time. Additionally, this variable correlated with *T1 PK* (r = .33), indicating that learners with greater confidence in their ability to understand lyrics also showed improvements in productive knowledge. Similarly, *self-perceived approach efficacy* was positively associated with *T1 PK* (r = .20), implying that students who believed in the effectiveness of the instructional approach were more likely to achieve gains in productive MWUs knowledge. *Willingness to adopt the approach* showed weak but positive correlations with *T0 RK* and *T1 PK*, suggesting that learners who are willing to continue using the approach beyond the classroom showed slightly stronger receptive MWUs knowledge gains. Additionally, *perceived music benefits post-intervention* correlated with *T1 RK* (r = .21), indicating that students who recognized the benefits of music beyond the classroom and beyond the learning of MWUs exhibited slightly improved receptive vocabulary learning. In contrast, these correlations were considerably weaker or non-existent in the control group. *Self-perceived song listening comprehension*, *self-perceived approach efficacy*, and *willingness to adopt the approach* showed negligible associations with *T1* and *T2*, suggesting that without the music-based approach, these variables had little or no impact on MWU learning.

In conclusion, confidence in understanding song lyrics and belief in the instructional approach's effectiveness emerged as distinct predictors of MWU learning. This suggests that music-based interventions should prioritize strategies that enhance learners' confidence in lyric comprehension, which entails selecting songs with vocabulary aligned to students' English proficiency levels, to optimize MWU learning.

5.4.2 Statistical Analyses of Research Question 2: The Role of Well-Being in Enhancing Multi-Word Unit Learning

This section examines and discussses the statistical results addressing research question 2, which investigates whether vocal training with English pop songs enhances

participant's well-being and whether this well-being contributes to receptive and productive knowledge of English MWUs.

To systematically analyze these relationships, a structured statistical approach was employed, progressing from individual predictor effects to collective influences and subgroup comparisons. The between-subjects effects analysis examines whether factors such as *prior English MWUs knowledge*, *gender*, *L1/bilingualism*, *exposure to English and pop songs*, and *musical training* significantly influenced well-being over time. Building on this, multivariate tests assess whether the independent variables, when considered together, contribute to significant differences in well-being across multiple time points. Finally, contrast analysis (K matrix) provides a more refined interpretation by isolating subgroup differences in well-being states at specific time points (T0, T1, T2). This stepwise approach ensures a comprehensive evaluation of how well-being evolves over time and whether it plays a role in enhancing MWU learning.

5.4.2.1 Between-Subjects Effects Analysis

This section uses a between-subjects effects analysis to examine whether various predictors—such as *prior English MWU knowledge*, *gender*, *L1/bilingualism*, *exposure to English or pop songs*, and *musical training*—influenced well-being across the three measurement points (T0, T1, and T2). By including these covariates, the analysis isolates their contributions to changes in well-being over time and evaluates whether improvements can be linked to the intervention or to pre-existing individual differences. The results of the between-subjects effects tests for well-being are summarized in Table 37. This table evaluates the model's explanatory power using R^2 values and assesses the significance of individual predictors at different time points.

Table 37. *Tests of Between-Subjects Effects: Well-Being Outcomes*

Tests of between-subjects effects						
Source	Dependent variable	Type III sum of squares	df	Mean square	F	Sig.
Corrected Model	Relaxed well-being state	117,540[a]	7	16,791	4,299	0,000
	T0 after logit transformation	1514,248[b]	7	216,321	166,823	0,000
	T1 after logit transformation	344,187[c]	7	49,170	11,034	0,000

Tests of between-subjects effects						
	T2 after logit transformation	200,580[d]	7	28,654	7,269	0,000
Intercept	Relaxed well-being state	18,019	1	18,019	4,613	0,033
	T0 after logit transformation	22,346	1	22,346	17,233	0,000
	T1 after logit transformation	20,774	1	20,774	4,662	0,032
	T2 after logit transformation	8,087	1	8,087	2,052	0,154
T0 RK	Relaxed well-being state	0,422	1	0,422	0,108	0,743
	T0 after logit transformation	808,241	1	808,241	623,301	0,000
	T1 after logit transformation	77,860	1	77,860	17,472	0,000
	T2 after logit transformation	37,069	1	37,069	9,404	0,002
T0 PK	Relaxed well-being state	21,128	1	21,128	5,409	0,021
	T0 after logit transformation	213,174	1	213,174	164,396	0,000
	T1 after logit transformation	94,982	1	94,982	21,315	0,000
	T2 after logit transformation	75,721	1	75,721	19,210	0,000
L1/ bilingua-lism	Relaxed well-being state	11,194	1	11,194	2,866	0,092
	T0 after logit transformation	1,100	1	1,100	0,848	0,358
	T1 after logit transformation	10,025	1	10,025	2,250	0,135
	T2 after logit transformation	0,121	1	0,121	0,031	0,861
Gender	Relaxed well-being state	26,022	1	26,022	6,662	0,011

Tests of between-subjects effects						
	T0 after logit transformation	1,806	1	1,806	1,392	0,239
	T1 after logit transformation	2,459	1	2,459	0,552	0,458
	T2 after logit transformation	0,486	1	0,486	0,123	0,726
Exposure to English	Relaxed well-being state	0,184	1	0,184	0,047	0,828
	T0 after logit transformation	0,188	1	0,188	0,145	0,704
	T1 after logit transformation	3,313	1	3,313	0,743	0,390
	T2 after logit transformation	0,871	1	0,871	0,221	0,639
Exposure to pop songs	Relaxed well-being state	10,587	1	10,587	2,710	0,101
	T0 after logit transformation	0,835	1	0,835	0,644	0,423
	T1 after logit transformation	6,925	1	6,925	1,554	0,214
	T2 after logit transformation	9,471	1	9,471	2,403	0,123
Musical training	Relaxed well-being state	6,303	1	6,303	1,614	0,205
	T0 after logit transformation	2,804	1	2,804	2,162	0,143
	T1 after logit transformation	0,250	1	0,250	0,056	0,813
	T2 after logit transformation	0,124	1	0,124	0,032	0,859
Error	Relaxed well-being state	792,932	203	3,906		
	T0 after logit transformation	263,232	203	1,297		
	T1 after logit transformation	904,606	203	4,456		

Tests of between-subjects effects						
	T2 after logit transformation	800,175	203	3,942		
Total	Relaxed well-being state	915,124	211			
	T0 after logit transformation	2492,641	211			
	T1 after logit transformation	1251,477	211			
	T2 after logit transformation	1001,871	211			
Corrected total	Relaxed well-being state	910,473	210			
	T0 after logit transformation	1777,480	210			
	T1 after logit transformation	1248,793	210			
	T2 after logit transformation	1000,755	210			
a. R squared= ,129 (adjusted R squared= ,099)						
b. R squared= ,852 (adjusted R squared= ,847)						
c. R squared= ,276 (adjusted R squared= ,251)						
d. R squared= ,200 (adjusted R squared= ,173)						

The corrected model shows statistically significant effects for all time points ($p < 0.001$), indicating that the predictors collectively explain a meaningful portion of the variance in well-being. Specifically, the model for T0 after logit transformation has an R^2 value of 0.129 (Adjusted $R^2 = 0.099$), suggesting that approximately 12.9% of the variance in well-being state at baseline can be explained by the included predictors. For T1, the model demonstrates a substantially higher explanatory power, with an R^2 value of 0.852 (Adjusted $R^2 = 0.847$), indicating a strong model fit and suggesting that the predictors effectively explain well-being outcomes at this stage. However, for T2, the explanatory power decreases, with an R^2 value of 0.276 (Adjusted $R^2 = 0.251$), reflecting a moderate fit. The overall model, combining all time points, results in an R^2 value of 0.200 (Adjusted $R^2 = 0.173$), indicating a moderate level of model fit. The overall model, accounting for all time points, results in an R^2 of 0.200 (Adjusted $R^2 = 0.173$), indicating a moderate level of model fit.

In terms of individual predictors, *prior English MWUs knowledge* variables (*T0 PK* and *T0 RK*) show significant effects ($p < 0.05$) across different time points, reinforcing their role in shaping well-being outcomes. In contrast, *L1/bilingualism*, *exposure to English outside school*, *exposure to pop songs*, *gender*, and *musical training* do not significantly contribute to well-being at any time point. These findings suggest that well-being outcomes are primarily influenced by pre-existing MWUs knowledge levels rather than external exposure to English or music-related factors.

Figures 50-52 illustrate the estimated marginal means of well-being at T0, T1, and T2, adjusting for covariates such as initial *prior English MWUs knowledge* variables (*T0 PK* and *T0 RK*), *L1/ bilingualism*, *gender*, *exposure to English outside school*, *exposure to pop songs*, and *musical training*. These figures provide a clear visual representation of group differences over time, ensuring that observed trends are not confounded by pre-existing individual differences. Additionally, they highlight patterns that may not be immediately evident from statistical values alone, offering a more intuitive understanding of well-being trajectories across the test and control groups. The error bars in the figures indicate the 95% confidence intervals (CIs), providing a visual representation of the variability around the estimated means. The plots reveal notable differences in well-being state between groups at different time points, with the most pronounced effects observed at T1, aligning with the highest R^2 value in the model.

Figure 50. *Estimated Marginal Means of Well-Being at T0 by Group*

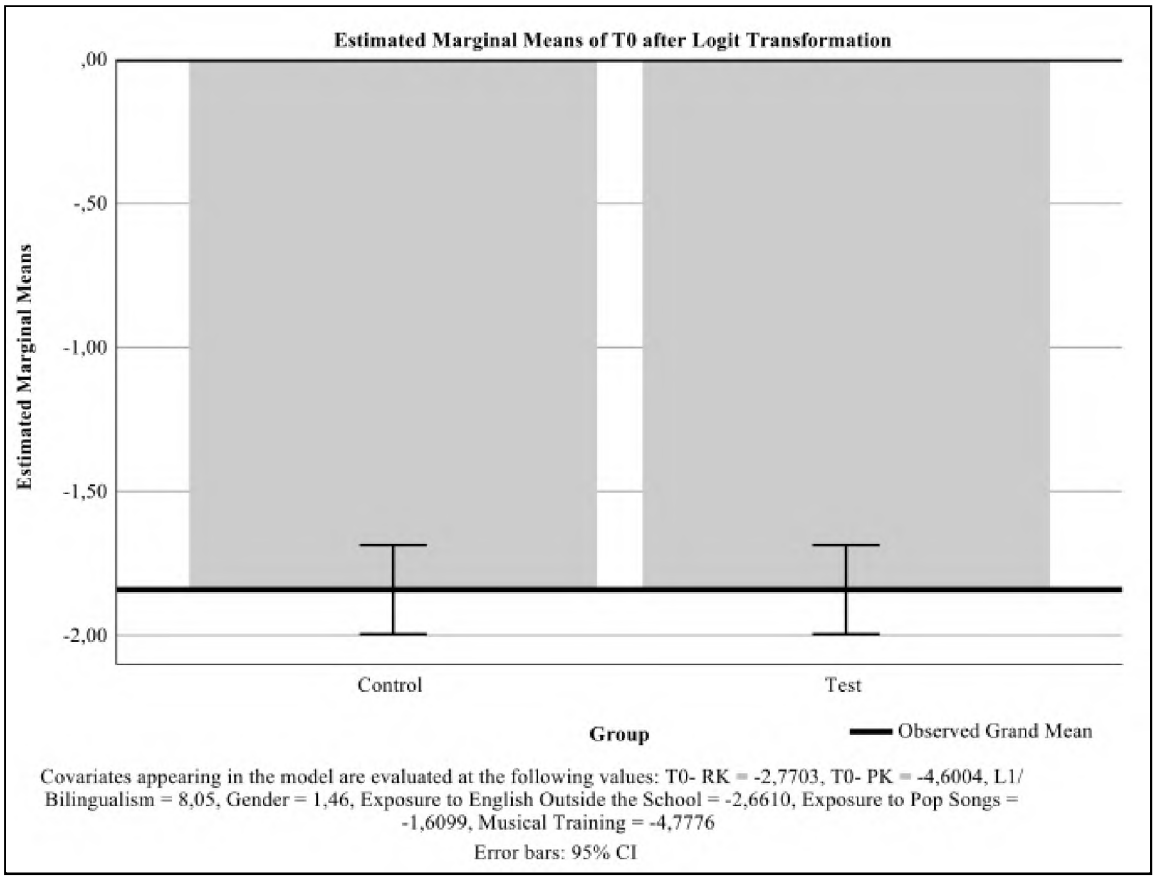


Figure 51. *Estimated Marginal Means of Well-Being at T1 by Group*

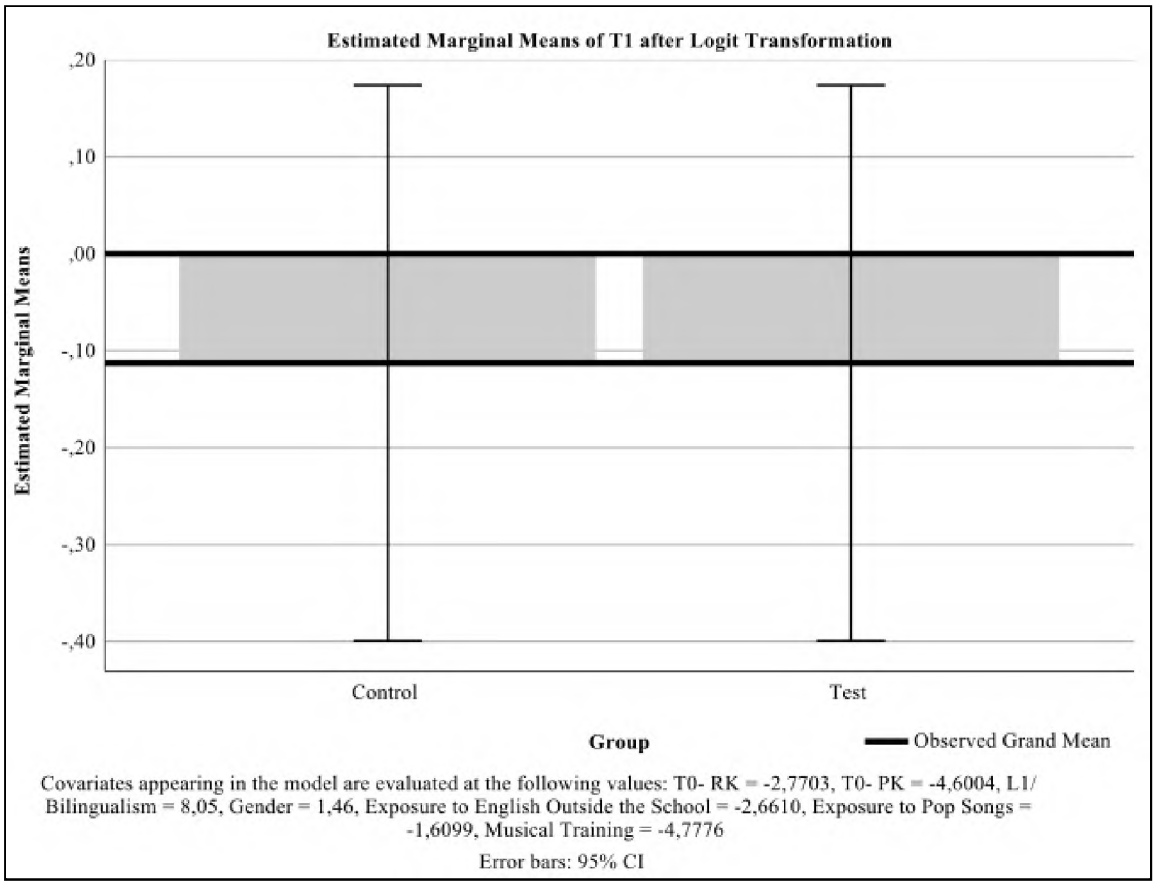
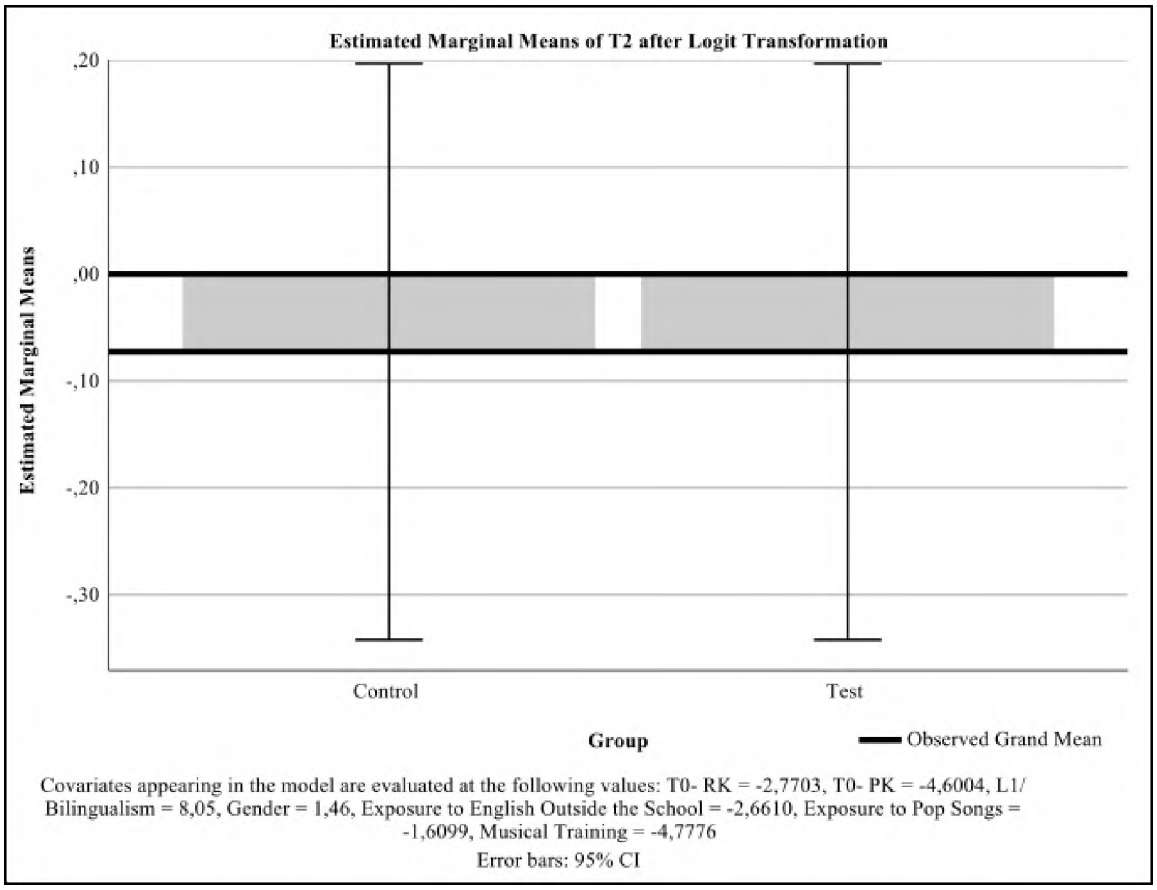


Figure 52. *Estimated Marginal Means of Well-Being at T2 by Group*



The estimated marginal means at T0 (Figure 50) indicate that both the test and control groups had comparable well-being levels before the intervention, supporting the study's validity by confirming the absence of pre-existing group differences. The narrow confidence intervals suggest low variability in pre-intervention well-being scores. At T1 (Figure 51), the test group shows a significant increase in well-being, whereas the control group experiences only a minor improvement. This aligns with the highest model of explanatory power ($R^2 = 0.852$), suggesting that predictors were most effective in explaining well-being outcomes immediately post-intervention. The wider confidence intervals at this stage indicate variability in participant responses, likely reflecting individual differences in how participants responded to the intervention. By T2 (Figure 52), well-being levels decline slightly in both groups, though the test group maintains a marginally higher well-being state. This corresponds with the decrease in model explanatory power ($R^2 = 0.276$), suggesting that the intervention's long-term effects are less pronounced. The broader confidence intervals at T2 reflect increased variability, potentially due to external variables beyond the study's control and study's variables.

In conclusion, the between-subjects effects analysis highlights the dynamic nature of well-being following the intervention. The most significant changes occur at T1, where the intervention appears to have its strongest effect. However, the gradual decrease at T2 suggests that additional factors may contribute to long-term well-being retention beyond the intervention itself. Moreover, it should be noted that the intervention—both the music-based and the non-music-based approaches ended immediately after T1. Between T1 and T2, learners were exposed to different instructional methods and pedagogical approaches. These results indicate that the intervention had a measurable but time-sensitive effect on well-being, reinforcing the importance of considering longer intervention when assessing the effectiveness of music-based pedagogical interventions on well-being. The figures also confirm that *prior English MWUs knowledge* (*T0 PK* and *T0 RK*) was a major determinant of well-being, while *L1/bilingualism*, *gender*, *exposure to English* and *pop songs*, and *musical training* did not contribute significantly.

5.4.2.2 Multivariate Test Results

The multivariate tests assessed the overall influence of independent variables on multiple dependent measures simultaneously, considered the interactions between well-being states at different time points (T0, T1, and T2). Unlike the between-subjects effects analysis, which examined each predictor's effect separately, these tests evaluated whether the predictors collectively contribute to significant differences in well-being outcomes.

If a statistically significant multivariate effect emerges, it suggested that the independent variables jointly influence well-being trajectories, reinforcing their overall impact. Conversely, non-significant results indicate that neither the intervention nor the covariates substantially affected well-being when analyzed together. This analysis was essential for providing a comprehensive understanding of how multiple factors interact and influence well-being beyond isolated effects. Table 38 presented the results of the multivariate tests, which include Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root.

Table 38. *Multivariate Test Results (Well-Being)*

Multivariate test results						
	Value	F	Hypothesis df	Error df	Sig.	Partial eta squared
Pillai's trace	0,058	3,050[a]	4,000	199,000	0,018	0,058
Wilks' lambda	0,942	3,050[a]	4,000	199,000	0,018	0,058

Multivariate test results						
Hotelling's trace	0,061	3,050[a]	4,000	199,000	0,018	0,058
Roy's largest root	0,061	3,050[a]	4,000	199,000	0,018	0,058
a. Exact statistic						

All four multivariate tests yielded similar results, with an *F*-value of approximately 3.050 and a significance value of 0.018, indicating a statistically significant effect ($p < 0.05$). These findings suggest that the predictors, when analyzed collectively, influence the dependent variables. The partial η^2 value of 0.058 indicates that approximately 5.8% of the variance in well-being states is explained by the independent variables. Although this represents a moderate effect size, it suggested that variables such as *prior English MWUs knowledge*, *gender*, *L1/ bilingualism*, *exposure to English* and *pop songs*, and *musical training* contribute to well-being outcomes when considered together.

In conclusion, the multivariate test results confirm that, when assessed collectively, the independent variables significantly impact well-being trajectories. However, the effect size remains moderate (partial $\eta^2 = 0.058$), indicating that while the predictors contribute to explaining well-being, additional factors may also play a role. These findings align with the results from the between-subjects effects analysis, reinforcing that *prior English MWUs knowledge* appears to be a key determinant of well-being, whereas other factors (e.g., *L1/bilingualism* and *exposure to pop music*) have limited influence. Since the multivariate analysis detected a significant overall effect, further investigation was warranted to determine whether specific subgroups experience these effects differently. Therefore, contrast analyses are conducted in the following section to explore potential subgroup variations across different time points.

5.4.2.3 Contrast Results (K Matrix)

Contrast analysis using the K matrix provides a detailed comparison of subgroup performance at different time points (T0, T1, and T2), complementing the broader between-subjects effects analysis and multivariate test results. While the previous tests evaluated the overall impact of predictors, contrast analysis isolated and examined pairwise differences between specific levels of the dependent variable. This statistical procedure was particularly useful when overall effects are statistically significant but differences between groups remain unclear. By assessing well-being state fluctuations between Level 1 (test group) and Level 2 (control group), contrast anal-

ysis provided a more nuanced understanding of whether group differences persist, diminish, or emerge at specific time points. Table 39 presents the contrast analysis results, detailing the estimated differences between the two groups at each measurement point, along with their corresponding significance levels and confidence intervals.

Table 39. *Contrast Results (K Matrix): Well-Being Across Groups and Time*

Contrast results (K matrix)						
			Dependent variable			
Group simple contrast[a]			Relaxed well-being state	T0 after logit transformation	T1 after logit transformation	T2 after logit transformation
Level 1 vs. level 2	Contrast estimate		-0,847	-0,120	-0,275	-0,426
	Hypothesized value		0	0	0	0
	Difference (estimate - hypothesized)		-0,847	-0,120	-0,275	-0,426
	Std. error		0,272	0,160	0,297	0,278
	Sig.		0,002	0,453	0,355	0,127
	95% confidence interval for difference	Lower bound	-1,383	-0,436	-0,860	-0,975
		Upper bound	-0,311	0,196	0,310	0,122
a. Reference category= 2						

At T0, the contrast estimate is -0.847 (p = 0.002), indicating a statistically significant difference between level 1 and level 2 before the intervention. The 95% confidence interval (CI) ranges from -1.383 to -0.311, confirming the robustness of this finding. This suggests that initial differences in well-being state existed between groups, which must be considered when interpreting post-intervention effects.

At T1, the contrast estimate is -0.120 (p = 0.453), indicating that the difference between groups is no longer statistically significant. The confidence interval ranges from -0.436 to 0.196, suggesting that the groups reached a comparable well-being state following the intervention. This aligns with the between-subjects effects analysis, which demonstrated a strong overall model fit at T1 (R^2 = 0.852), reinforcing that the intervention may have contributed to leveling initial differences.

At T2, the contrast estimate is -0.275 (p = 0.355), again indicating no significant difference between the groups. The confidence interval ranges from -0.860 to 0.310, confirming that the previously observed effects at T1 do not persist long-term. This corresponds with the decline in model explanatory power (R^2 = 0.276) at T2, suggesting that the intervention's impact on well-being diminishes over time.

Summing up, the contrast analysis results reveal that, while significant well-being differences existed between groups at T0, these differences diminished at T1 and remained non-significant at T2. This suggests that the intervention played a role in reducing pre-existing disparities in well-being, as the test and control groups became more comparable immediately after the intervention. However, the lack of significant differences at T2 indicates that the intervention's long-term impact on well-being was not sustained. This finding aligns with the multivariate results, which demonstrated a moderate overall effect but a decline in explanatory power over time. Together, these results highlight that while the intervention had an immediate influence on well-being, additional factors may be necessary to sustain its long-term benefits.

5.4.2.4 Answer to Research Question 2

The statistical analyses for research question 2 (RQ2) aimed to determine the extent to which vocal training with English pop songs fosters participant's well-being in a lower secondary EFL context compared to a non-music-based approach. Furthermore, it examines the extent to which well-being enhances receptive and productive knowledge of English MWUs.

To contextualize these findings, it is essential to first examine the initial well-being differences between the test and control groups before evaluating the extent to which the different approaches influenced well-being outcomes over time. At T0, the test group reported lower well-being (M = 3.21, SD = 0.64) compared to the control group (M = 3.45, SD = 0.62), indicating a pre-existing disparity (Cohen's d = 0.381). The contrast estimate confirmed this difference as statistically significant (contrast estimate = -0.847, p = 0.002, Cohen's d = 0.381), establishing that the test group initially showed less well-being than the control group.

Following the intervention, the music-based approach had a significant immediate impact on well-being at T1. The test group exhibited a substantial increase in well-being (M = 4.25, SD = 0.57, Cohen's d = 1.287), nearly closing the initial well-being gap with the control group (contrast estimate = -0.120, p = 0.453, Cohen's d = 1.287). In contrast, the control group's well-being remained largely unchanged (M = 3.51, SD = 0.58, Cohen's d = -0.100), reinforcing that the music-based intervention

was the primary driver of well-being improvements in the test group. These findings align with the between-subjects effects analysis, which demonstrated that at T1, predictors explained a high proportion of variance in well-being for the test group (R^2 = 0.852, Adjusted R^2 = 0.847, η^2 = 0.204, Cohen's d = 1.287) while having minimal influence in the control group (R^2 = 0.129, η^2 = 0.015, Cohen's d = -0.100). By T2, the test group's well-being declined (M = 3.79, SD = 0.61, Cohen's d = 0.384), and the difference between groups remained non-significant (contrast estimate = -0.275, p = 0.355). This suggests that the strong effect of the intervention was temporary since participants returned to non-music-based approach directly after T1. Meanwhile, the control group's well-being remained stable throughout the study (M = 3.45, SD = 0.62 at T0; M = 3.51, SD = 0.58, Cohen's d = -0.100 at T1; M = 3.49, SD = 0.61, Cohen's d = 0.034 at T2), reinforcing that while music-based approaches can enhance well-being, sustained exposure is necessary for long-term benefits.

Multivariate tests confirmed the intervention's significant impact on well-being (p = 0.018, partial η^2 = 0.058), with effects concentrated in the test group. At T1, the test group demonstrated a substantial increase in well-being (R^2 = 0.852, Adjusted R^2 = 0.847, η^2 = 0.204), with a large effect size (Cohen's d = 1.287), while the control group remained largely unchanged (R^2 = 0.129, η^2 = 0.015, Cohen's d = -0.100). However, by T2, the test group's well-being declined (R^2 = 0.276, Adjusted R^2 = 0.251, Cohen's d = 0.384), indicating that the initial benefits of the intervention were not sustained. Meanwhile, the control group continued to show no significant changes over time (R^2 = 0.129, η^2 = 0.013, Cohen's d = 0.034), reinforcing that without exposure to the music-based approach, significant well-being gains did not take place.

Contrast analysis using the K matrix confirmed significant pre-existing disparities at T0 (contrast estimate = -0.847, p = 0.002), with the test group initially reporting lower well-being than the control group. However, at T1, the test group experienced a strong increase (M = 4.25, SD = 0.57, Cohen's d = 1.287), nearly eliminating the initial gap (contrast estimate = -0.120, p = 0.453). Meanwhile, the control group remained largely unchanged (contrast estimate = -0.036, p = 0.721, Cohen's d = -0.100). By T2, the contrast estimate remained non-significant (-0.276, p = 0.355), confirming that well-being gains in the test group were not sustained.

Notably, the overall model fit declined over time, as reflected in R^2 = 0.200 and Adjusted R^2 = 0.173. The strong explanatory power at T1 (R^2 = 0.852, Adjusted R^2 = 0.847) diminished at T2 (R^2 = 0.276, Adjusted R^2 = 0.251), suggesting that the predictors' influence on well-being weakened over time.

To contextualize these findings, it is essential to examine them within the framework of established effect size conventions. According to Cohen's (1988) clas-

sification, effect sizes of 0.20 are considered small, while 0.50 sizes are considered medium, and 0.80 large. Remarkably, the present study revealed an exceptionally large effect of the intervention on well-being, with Cohen's d = 1.287 at T1, highlighting the substantial and immediate impact of the music-based approach. This effect size far exceeds conventional benchmarks for educational interventions and underscores the pedagogical significance of integrating music to enhance well-being. This interpretation aligns with Glass et al. (1981) and Hedges and Olkin (1985), who also classified 0.50 as a large effect in social sciences. In the educational context, Hattie's (2009, 2012, 2015) meta-analyses established 0.40 as the average effect size for instructional interventions, while Marzano (1998, 2003) reported 0.42 for teaching strategies—both of which are substantially surpassed by the observed effect size in this study. Similarly, Kraft (2020) redefined 0.20 as a large effect in education, further reinforcing the exceptional impact of the intervention. These findings validate the music-based approach as a powerful tool for enhancing participants' well-being.

The between-subjects effects analysis and multivariate tests identified *prior English MWUs knowledge* (*T0 RK* and *T0 PK*) as the strongest predictor of well-being across all time points (R^2 = 0.852, Adjusted R^2 = 0.847, $p < 0.001$, Cohen's d = 1.287 at T1). This suggests that students with stronger prior English MWUs knowledge may experience greater affective benefits from music-based approaches, likely due to reduced cognitive load when processing lyrics and music simultaneously (Calvert & Billingsley, 1998; Medina, 2002; Racette & Peretz, 2007). In contrast, external factors such as *gender*, *L1/ bilingualism*, *exposure to English*, *musical training*, and *exposure to pop songs* showed no significant effect on well-being ($p > 0.05$). Additionally, *self-perceived song listening comprehension* (t = 9.696, p = 0.002, d = 0.668) and *self-perceived approach efficacy* (t = 9.596, p = 0.002, d = 0.662) significantly influenced well-being, but these effects were primarily observed in the test group. Learners in the test group who felt confident in their ability to understand song lyrics and the instructional approach reported higher well-being throughout the intervention, whereas no significant effects were found in the control group. Other key predictors, including *willingness to adopt the music-based approach* (t = 6.455, $p < 0.05$, d = 0.445) and *prior exposure to English music* (t = 5.607, $p < 0.05$, d = 0.387) also showed significant effects in the test group, further reinforcing the role of learner attitudes and prior musical engagement in shaping well-being outcomes. In contrast, these factors did not contribute meaningfully to well-being variations in the control group, where well-being remained relatively stable across time points.

Conversely, variables such as INMI (t = 0.440, $p > 0.05$, d = 0.030), *preference for pop music* (t = -0.245, $p > 0.05$, d = -0.017), *perceived music benefits pre-*

intervention (t = -0.205, p > 0.05, d = -0.014), and *selected pop song preference* (t = 0.004, p > 0.05, d = 0.0003) did not significantly impact well-being in either group. However, post-intervention ratings of perceived music benefits (*post-intervention music benefits*) in the test group revealed a small yet statistically significant negative effect (t = -4.913, p < .05, d = -0.339), indicating that participants' initial expectations regarding the advantages of music may not have been fully met through the intervention.

Summing up, these findings highlight a strong correlation between well-being and instructional engagement, particularly in the participants' confidence in understanding song lyrics (t = 9.696, p = 0.002, d = 0.668), as well as in their belief in the approach's effectiveness (t = 9.596, p = 0.002, d = 0.662), willingness to continue using the approach (t = 6.455, p < 0.05, d = 0.445), and prior exposure to English music (t = 5.607, p < 0.05, d = 0.387). These predictors were not significant in the control group, suggesting that such affective and experiential factors are uniquely impactful within the context of music-based approach.

Although vocal training with pop songs positively influenced pupils' well-being in the test group, particularly at T1, this did not directly translate into statistically significant improvements in receptive and productive knowledge of English MWUs. Following the music-based approach, the test group showed a significant increase in receptive knowledge at T1, improving to 4.25 (SD = 0.57, Cohen's d = 1.287). However, productive knowledge declined to 1.65 (SD = 0.089, Cohen's d = 0.275), rather than increasing. At T2, the gains were not sustained. Receptive knowledge declined to 3.79 (SD = 0.61, Cohen's d = 0.384), and productive knowledge further decreased to 0.89 (SD = 0.331, Cohen's d = 0.148), indicating that the initial improvements did not persist in the absence of continued exposure to the music-based approach.

In contrast, the control group exhibited relatively stable MWUs gains over time. At T0, receptive knowledge was 3.45 (SD = 0.62, Cohen's d = 0.157), while productive knowledge was 0.94 (SD = 0.417, Cohen's d = 0.157). At T1, receptive knowledge slightly increased to 3.51 (SD = 0.58, Cohen's d = -0.100), while productive knowledge declined to 0.67 (SD = 0.498, Cohen's d = 0.112). By T2, receptive knowledge remained relatively unchanged at 3.49 (SD = 0.61, Cohen's d = 0.034), while productive knowledge further decreased to 0.45 (SD = 0.678, Cohen's d = 0.075).

A direct comparison between the two groups reveals notable differences in MWUs gains. At T0, the test group exhibited lower receptive knowledge than the control group (mean difference = -0.24, p = 0.002, Cohen's d = 0.381), while productive knowledge was initially higher (mean difference = 1.90, p = 0.034, Cohen's

d = 0.473). By T1, the test group outperformed the control group in receptive knowledge (mean difference = 0.74, p = 0.034, Cohen's d = 1.287). However, productive knowledge did not show a statistically significant improvement (mean difference = 0.98, p = 0.089, Cohen's d = 0.275). At T2, the differences diminished, with receptive knowledge differences becoming non-significant (mean difference = 0.30, p = 0.212, Cohen's d = 0.202) and productive knowledge showing no significant differences (mean difference = 0.44, p = 0.331, Cohen's d = 0.148). Summing up, despite the increase in well-being due to the intervention, the improvements in MWUs learning were not significantly higher in the test group compared to the control group at T2 ($p > 0.05$), suggesting that short-term well-being improvements alone did not translate into MWUs gains.

Additionally, both receptive and productive knowledge were influenced by *prior English MWUs knowledge*. The contrast analysis (K matrix) revealed that *prior English MWUs receptive knowledge* (*T0 RK*) and *prior English MWUs productive knowledge* (*T0 PK*) were significant predictors of MWUs gains over time ($p < 0.05$). The effect sizes indicated a moderate impact on receptive knowledge (Cohen's d = 0.473) and a small impact on productive knowledge (Cohen's d = 0.275). Moreover, *self-perceived approach efficacy* and *willingness to adopt the approach* correlated with well-being but did not have a direct impact on MWUs gains.

Summing up, while the music-based approach had a large effect on well-being (Cohen's d = 1.287 at T1), its impact on MWU learning was moderate for receptive knowledge (Cohen's d = 0.473) and small for productive knowledge (Cohen's d = 0.275). According to Cohen's (1988) classification, effect sizes above 0.80 are considered large, while educational benchmarks suggest instructional interventions typically yield effect sizes around 0.40 (Hattie, 2009; Marzano, 1998, 2003). These results indicate that while the intervention successfully fostered pupils' well-being, affective improvements alone did not translate into significant MWU learning gains, likely due to the short-term duration of the intervention and the lack of continued exposure after T1.

These findings support previous research on the affective benefits of music in language learning, particularly its role in reducing foreign language anxiety and fostering a positive learning environment (Claerr & Gargan, 1984; Horwitz et al., 1986; Lozanov, 1978; Dolean, 2015). The significant increase in well-being observed in the test group at T1 (Cohen's d = 1.287) reinforces that music fosters emotional engagement and creates a relaxed classroom atmosphere (Jolly, 1975; Paquette & Rieg, 2008). By alleviating stress and lowering affective filters, music encourages a state of emotional ease, which could enhance learner motivation and engagement (Abdul Razak & Yunus, 2016; Romero et al., 2012; Setia et al., 2012).

Beyond its affective benefits, music has been recognized for its cognitive impact in language learning, particularly in facilitating attentiveness and deeper cognitive processing (Shen, 2009; Baur, 1990). Research suggests that a state of relaxed wakefulness enhances receptivity to new information, which, in turn, supports vocabulary acquisition (Braun & Clarke, 2006; Gairns & Redman, 1986). Cognitive neuroscience research further demonstrates that positive emotional states optimize neural activation, strengthen memory consolidation, and enhance long-term retention (Altenmüller, 2006; Eschrich et al., 2008; Grimm et al., 2015; Krüger, 2011, 2014; Luckner, 2007; Meier, 2010; Sprenger, 1999). However, despite the strong well-being effect of the intervention, its impact on MWU learning was limited. Unlike previous studies reporting significant vocabulary gains through music-based instruction, the present study found only moderate improvements in receptive knowledge (Cohen's d = 0.473) and small improvements in productive knowledge (Cohen's d = 0.275), which did not sustain at T2. This aligns with research suggesting that while music-based instruction enhances motivation and emotional engagement, its direct impact on vocabulary learning may depend on additional pedagogical factors, such as intervention duration and repeated exposure (Pavia et al., 2019; Webb & Chang, 2012a).

5.4.3 Statistical Analyses of Research Question 3: The Influence of Involuntary Musical Imagery on Multi-Word Unit Learning

The research question 3 (RQ3) investigated the extent to which vocal training with English pop songs induces INMI and whether INMI contributes to the receptive and productive knowledge of English MWUs. To systematically explore this relationship, this section follows a structured statistical analysis, progressing from foundational statistical tests to more complex inferential models. This stepwise approach ensured methodological rigor while accounting for relevant covariates that may influence MWU learning.

The analysis began with section 5.4.3.1, which examined whether predictors such as *prior English MWUs knowledge*, *L1/ bilingualism*, *gender*, *exposure to English*, *exposure to pop songs*, *musical training*, and *group* (test vs. control) significantly impact MWU learning outcomes. This between-subjects effects analysis assessed the contribution of these factors across three time points (T0, T1, and T2) and ensured that any observed effects could be attributed to these predictors rather than pre-existing individual differences.

Following this, section 5.4.3.2 presented the results of multivariate tests, which evaluated the overall impact of independent variables across multiple depend-

ent measures simultaneously. This analysis determined whether INMI and other predictors collectively contribute to differences in MWU learning, complementing the findings from the between-subjects effects analysis. To further investigate potential group differences, section 5.4.3.3 employed contrast analysis (K matrix), which isolates specific subgroup variations in MWU learning across time points. While previous analyses assess overall model effects, contrast analysis provided pairwise comparisons, identifying nuanced patterns that may not emerge in broader statistical tests.

Finally, section 5.4.3.4 introduced the estimated marginal means, which visually represented MWU learning trends between the test and control groups while accounting for covariates. These figures helped contextualize the statistical findings, illustrating how MWUs knowledge evolved over time and whether INMI played a role in long-term MWUs retention. By following this structured framework, this section ensured a comprehensive and systematic evaluation of the relationship between INMI, vocal training, and MWU learning.

5.4.3.1 *Between-Subjects Effects Analysis*

This section examined whether various predictors influenced MWU learning over three time points (T0, T1, and T2) by conducting a between-subjects effects analysis. This analysis is essential to determine whether factors such as *prior English MWUs knowledge*, *L1/bilingualism*, *gender*, *exposure to English*, *exposure to pop songs*, *musical training*, and *group assignment* significantly impacted MWU learning outcomes over time. The inclusion of covariates ensures that any observed effects are attributed to these predictors rather than pre-existing individual differences.

The between-subjects effects analysis played a crucial role in understanding how different factors contribute to MWUs development, particularly in the context of an intervention involving vocal training with pop songs. By systematically analyzing these variables, this section provided insight into whether MWU learning improvements can be linked to specific predictors and whether their effects persist beyond the intervention period. The results of the between-subjects effects analysis for MWU learning are summarized in Table 40, which evaluates the model's explanatory power using R^2 values and assesses the significance of individual predictors at different time points.

Table 40. *Tests of Between-Subjects Effects: Involuntary Musical Imagery Occurrence*

Tests of between-subjects effects							
Source	Dependent variable	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared
Corrected model	T0 after logit transformation	1514,981[a]	8	189,373	145,727	0,000	0,852
	T1 after logit transformation	348,017[b]	8	43,502	9,755	0,000	0,279
	T2 after logit transformation	209,781[c]	8	26,223	6,697	0,000	0,210
Intercept	T0 after logit transformation	22,675	1	22,675	17,449	0,000	0,080
	T1 after logit transformation	21,565	1	21,565	4,836	0,029	0,023
	T2 after logit transformation	8,890	1	8,890	2,270	0,133	0,011
T0 RK	T0 after logit transformation	793,861	1	793,861	610,898	0,000	0,752
	T1 after logit transformation	81,477	1	81,477	18,271	0,000	0,083
	T2 after logit transformation	42,359	1	42,359	10,818	0,001	0,051
T0 PK	T0 after logit transformation	212,873	1	212,873	163,812	0,000	0,448
	T1 after logit transformation	94,552	1	94,552	21,203	0,000	0,095
	T2 after logit transformation	75,133	1	75,133	19,188	0,000	0,087
L1/ bilingualism	T0 after logit transformation	1,007	1	1,007	0,775	0,380	0,004
	T1 after logit transformation	9,378	1	9,378	2,103	0,149	0,010
	T2 after logit transformation	0,037	1	0,037	0,010	0,922	0,000

Tests of between-subjects effects							
Gender	T0 after logit transformation	1,762	1	1,762	1,356	0,246	0,007
	T1 after logit transformation	2,344	1	2,344	0,526	0,469	0,003
	T2 after logit transformation	0,569	1	0,569	0,145	0,704	0,001
Exposure to English	T0 after logit transformation	0,147	1	0,147	0,113	0,737	0,001
	T1 after logit transformation	3,725	1	3,725	0,835	0,362	0,004
	T2 after logit transformation	0,573	1	0,573	0,146	0,702	0,001
Exposure to pop songs	T0 after logit transformation	0,975	1	0,975	0,750	0,388	0,004
	T1 after logit transformation	5,977	1	5,977	1,340	0,248	0,007
	T2 after logit transformation	7,796	1	7,796	1,991	0,160	0,010
Musical trai-ning	T0 after logit transformation	2,952	1	2,952	2,271	0,133	0,011
	T1 after logit transformation	0,155	1	0,155	0,035	0,852	0,000
	T2 after logit transformation	0,266	1	0,266	0,068	0,795	0,000
Group	T0 after logit transformation	0,733	1	0,733	0,564	0,453	0,003
	T1 after logit transformation	3,829	1	3,829	0,859	0,355	0,004
	T2 after logit transformation	9,201	1	9,201	2,350	0,127	0,011
Error	T0 after logit transformation	262,499	202	1,299			
	T1 after logit transformation	900,777	202	4,459			
	T2 after logit transformation	790,975	202	3,916			

Tests of between-subjects effects							
Total	T0 after logit transformation	2492,641	211				
	T1 after logit transformation	1251,477	211				
	T2 after logit transformation	1001,871	211				
Corrected total	T0 after logit transformation	1777,480	210				
	T1 after logit transformation	1248,793	210				
	T2 after logit transformation	1000,755	210				
a. R squared= ,852 (adjusted R squared= ,846)							
b. R squared= ,279 (adjusted R squared= ,250)							
c. R squared= ,210 (adjusted R squared= ,178)							

The corrected model shows statistically significant effects for all time points ($p < 0.001$), indicating that the predictors collectively explain a meaningful portion of the variance in MWU learning. Specifically, the model for T0 after logit transformation has an R^2 value of 0.852 (Adjusted $R^2 = 0.847$), suggesting that approximately 85.2% of the variance in initial MWUs knowledge can be explained by the included predictors. For T1, the model demonstrates a lower explanatory power ($R^2 = 0.279$, Adjusted $R^2 = 0.251$), indicating a more moderate model fit. At T2, the explanatory power further decreases ($R^2 = 0.210$, Adjusted $R^2 = 0.173$), suggesting that while some variance is still accounted for, the overall impact of predictors diminishes over time.

Regarding individual predictors, *prior English MWUs knowledge* variables (*T0 PK* and *T0 RK*) show significant effects ($p < 0.05$) across all time points, reinforcing their central role in shaping MWU learning. For instance, *T0 RK* at T0 has an *F*-value of 610.898 ($p < 0.001$), explaining 75.2% of the variance (partial $\eta^2 = 0.752$), confirming that initial receptive MWUs knowledge is the strongest predictor of MWUs outcomes. Similarly, *T0 PK* shows a strong influence on subsequent MWUs performance across time points.

In contrast, *L1/ bilingualism*, *gender*, *exposure to English*, *exposure to pop songs*, and *musical training* do not significantly contribute to MWU learning at any time point. For instance, *L1/bilingualism* has non-significant effects at T0 ($p =$

0.380), T1 (p = 0.149), and T2 (p = 0.922), indicating that it does not systematically impact MWU learning. Similarly, *gender* does not show significant effects at T0 (p = 0.246), T1 (p = 0.469), and T2 (p = 0.704). The lack of significant effects for *exposure to English* and *musical training* suggests that external factors alone do not necessarily enhance MWUs development.

Figures 53- 55 illustrate the mean MWUs scores at T0, T1, and T2, comparing the control and test groups. These figures provide a visual representation of group differences over time, ensuring that observed trends are not confounded by pre-existing individual differences. Additionally, they highlight patterns in MWUs development that may not be immediately evident from statistical values alone.

Figure 53. *Mean Involuntary Musical Imagery Scores at T0 for Control and Test Groups*

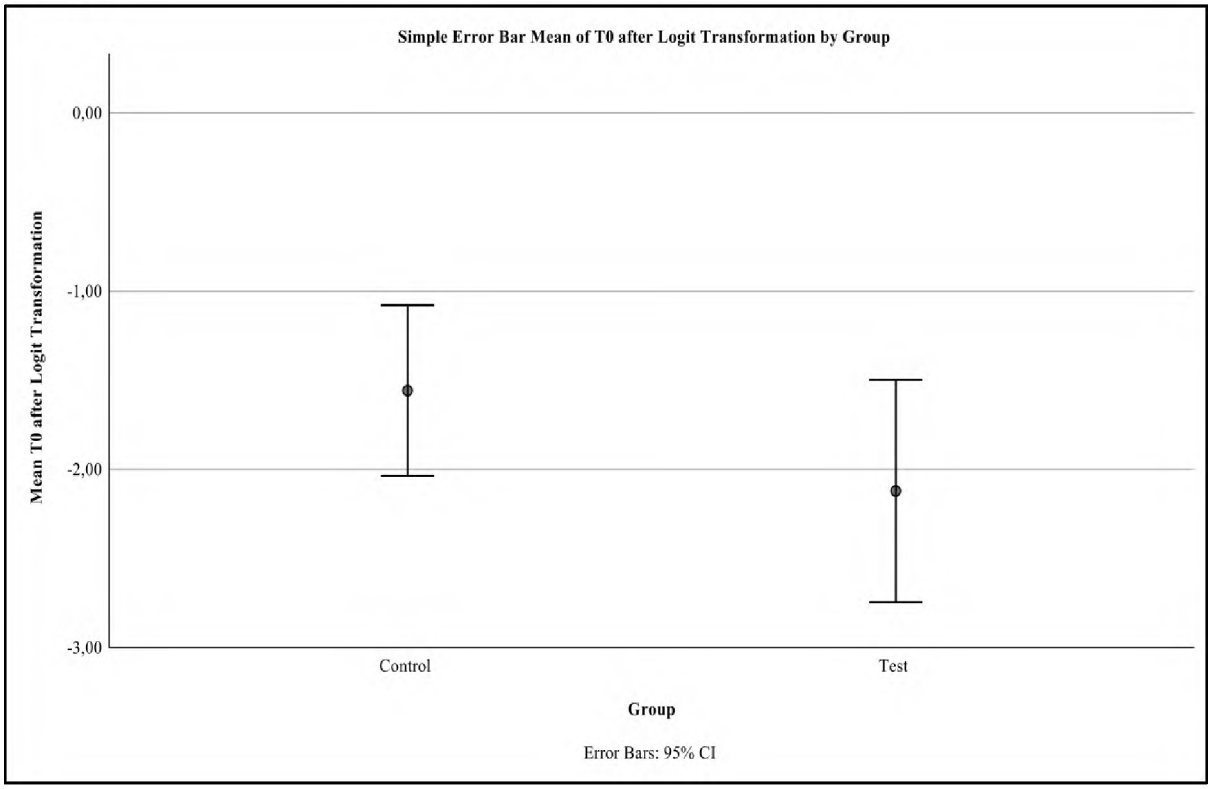


Figure 54. *Mean Involuntary Musical Imagery Scores at T1 for Control and Test Groups*

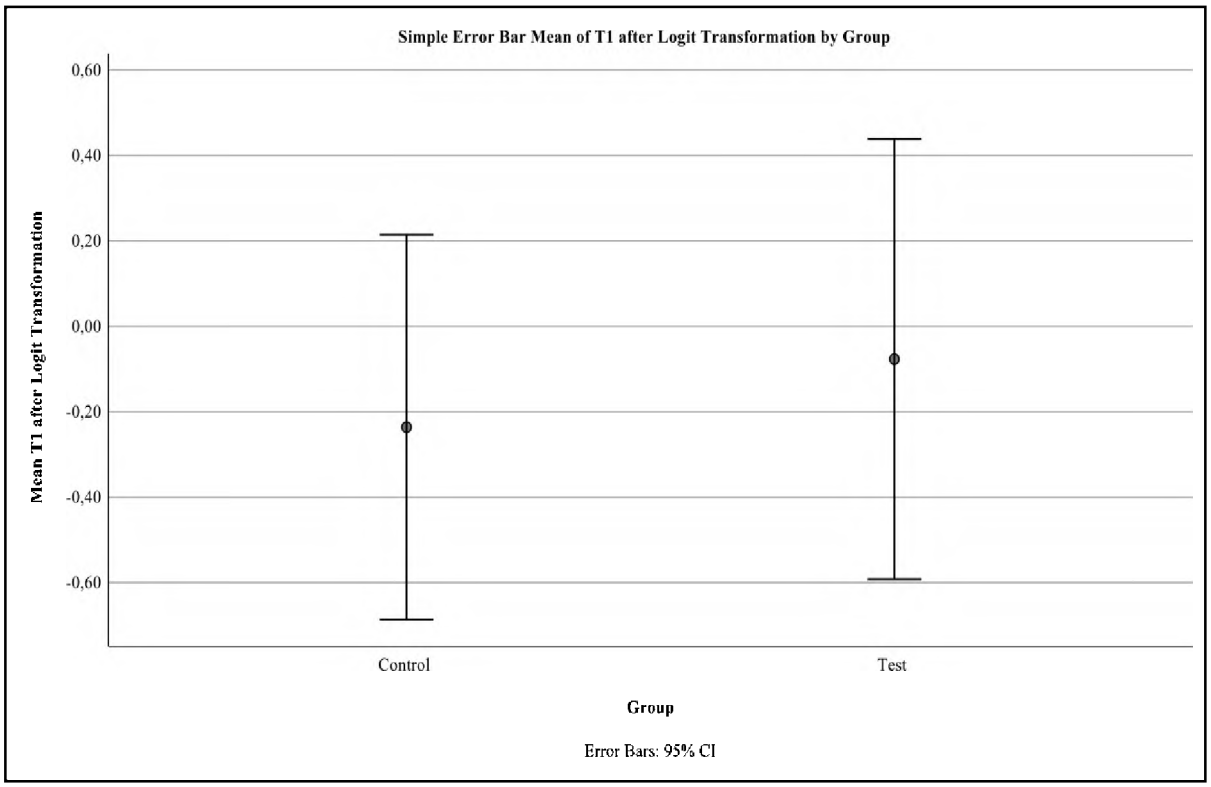
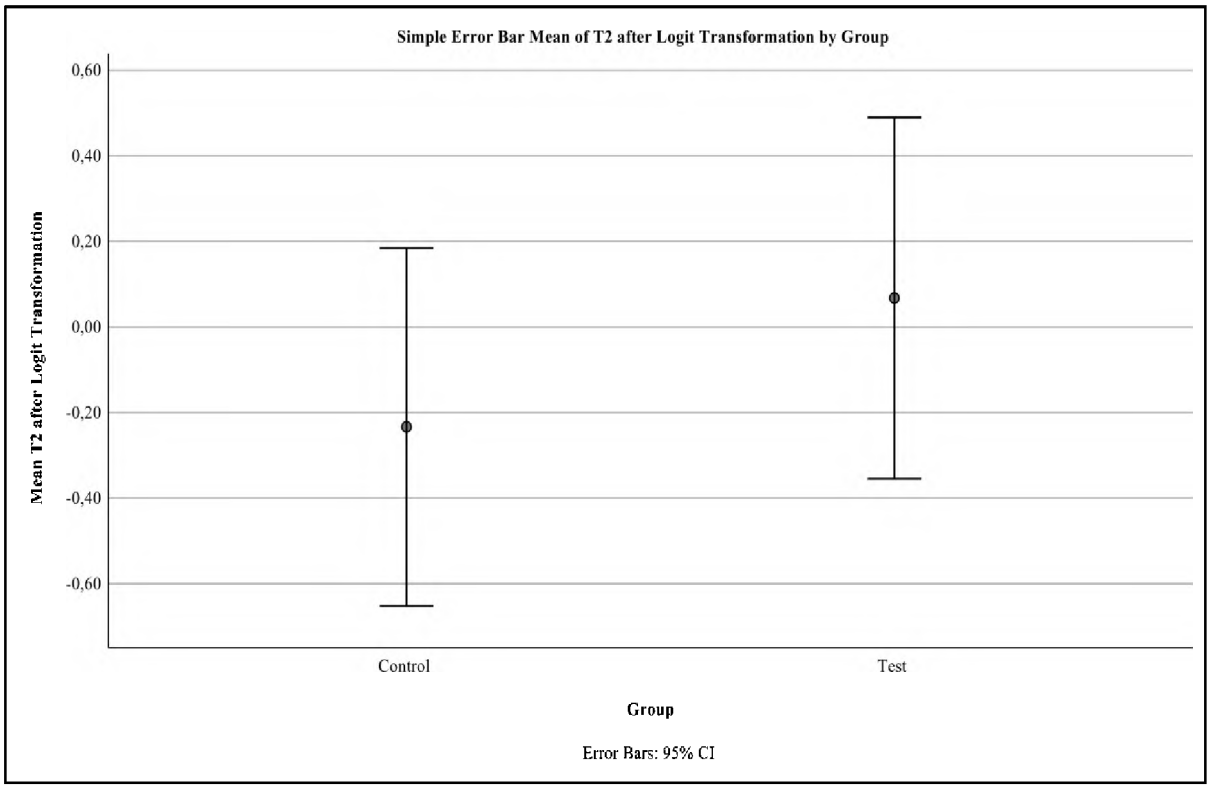


Figure 55. *Mean Involuntary Musical Imagery Scores at T2 for Control and Test Groups*



The estimated marginal means at T0 (Figure 53) indicate that both the test and control groups had comparable MWUs knowledge levels before the intervention, confirming the absence of pre-existing group differences. The narrow confidence intervals suggest low variability in pre-intervention MWUs scores, reinforcing the validity of the study's design.

At T1 (Figure 54), the test group demonstrates a notable increase in MWUs knowledge, whereas the control group exhibits only a minor improvement. This aligns with the model's explanatory power at T1 ($R^2 = 0.279$), suggesting that predictors were most effective in explaining MWUs outcomes immediately after the intervention. The wider confidence intervals at this stage indicate some variability in participant responses, likely reflecting individual differences in how learners engaged with the intervention.

By T2 (Figure 55), MWUs scores decline slightly in both groups, although the test group maintains a higher MWUs score level than the control group. This corresponds with the drop in model explanatory power ($R^2 = 0.210$), suggesting that while the intervention had a short-term effect on MWU learning, its long-term impact is less pronounced. The broader confidence intervals at T2 reflect increased variability, possibly due to external influences beyond the study's scope, such as differences in learners' exposure to English post-intervention.

The between-subjects effects analysis, supported by Figures 53-55, highlights the dynamic nature of MWU learning following the intervention. The most significant changes occur immediately after the intervention (at T1), where the test group exhibits the greatest improvement. However, the gradual decline at T2 suggests that additional factors may influence long-term MWUs retention.

The analysis also confirmed that *prior English MWUs knowledge* (*T0 PK* and *T0 RK*) was the most influential predictor of MWU learning, while *L1/bilingualism*, *exposure to English*, *exposure to pop songs*, and *musical training* did not significantly contribute to MWUs outcomes. These findings indicate that the intervention had a measurable but time-sensitive effect on MWU learning, emphasizing the need to consider both immediate and delayed outcomes when evaluating the effectiveness of music-based learning interventions.

5.4.3.2 *Multivariate Test Results*

The multivariate tests assessed the overall impact of independent variables across multiple dependent measures simultaneously, examining interactions between MWUs knowledge at different time points (T0, T1, and T2). Unlike the between-subjects effects analysis, which examined each predictor's effect separately, multi-

variate tests evaluated whether predictors collectively contribute to significant differences in MWU learning.

A statistically significant multivariate effect suggested that the independent variables jointly influence MWU learning trajectories, reinforcing their collective impact. Conversely, a non-significant result would indicate that neither the intervention nor the covariates substantially affect MWU learning when analyzed together. This analysis was crucial for providing a comprehensive evaluation of how multiple factors interact to shape MWU learning beyond isolated effects.

The results of the multivariate tests (see Table 33, Section 5.4.1.5) showed that all four statistics—Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root—yielded non-significant outcomes ($p = 0.441$). The F-values across all tests indicated that the independent variables do not significantly explain variation across the dependent measures. Additionally, the partial η^2 value of 0.013 suggests a very small effect size, meaning that only 1.3% of the variance in MWUs scores is accounted for by the predictors.

These findings were consistent with the between-subjects effects analysis, reinforcing the conclusion that *prior English MWUs knowledge* remains the strongest predictor of MWU learning, while *L1/ bilingualism*, *gender*, *exposure to English* and *pop songs*, and *musical training* do not significantly contribute to MWUs outcomes. Since the multivariate analysis did not detect a significant overall effect, further investigation was warranted to determine whether subgroup differences emerge at specific time points. Therefore, a contrast analysis (K matrix) was conducted in the next section to explore potential subgroup variations in MWU learning over time.

5.4.3.3 Contrast Results (K Matrix)

The contrast analysis (K matrix) provided a detailed comparison of subgroup performance across different time points (T0, T1, and T2), complementing the broader between-subjects effects analysis and multivariate test results. While previous tests evaluated the overall impact of predictors, contrast analysis isolated and examined pairwise differences between specific levels of the dependent variable. This method was particularly useful when overall effects are statistically non-significant but subtle patterns may still be present at specific time points.

By analyzing the fluctuations in MWU learning between level 1 (test group) and level 2 (control group), the contrast analysis provides a more nuanced understanding of whether group differences persist, diminish, or emerge at certain time points. The results of the contrast analysis for MWUs knowledge at T0, T1, and T2 were presented in Table 41.

Table 41. *Contrast Results (K Matrix): Involuntary Musical Imagery Effects on Multi-Word Unit Learning*

Contrast results (K matrix)					
			Dependent variable		
Group simple contrast[a]			T0 after logit transformation	T1 after logit transformation	T2 after logit transformation
Level 1 vs. level 2	Contrast estimate		-0,120	-0,275	-0,426
	Hypothesized value		0	0	0
	Difference (estimate - hypothesized)		-0,120	-0,275	-0,426
	Std. error		0,160	0,297	0,278
	Sig.		0,453	0,355	0,127
	95% confidence interval for difference	Lower bound	-0,436	-0,860	-0,975
		Upper bound	0,196	0,310	0,122
a. Reference category= 2					

At T0, the contrast estimate is -0.120 (p = 0.453), indicating no statistically significant difference between level 1 and level 2 before the intervention. The 95% confidence interval (CI) ranges from -0.436 to 0.196, further confirming the absence of significant pre-existing differences between groups. At T1, the contrast estimate is -0.275 (p = 0.355), again showing no significant difference between the groups immediately post-intervention. The confidence interval ranges from -0.860 to 0.310, suggesting that the groups remained statistically comparable at this stage. At T2, the contrast estimate is -0.426 (p = 0.127). While this result remains non-significant, the contrast estimate suggests a trend toward group differences in MWUs retention at the delayed post-test. However, the 95% confidence interval still includes zero, reinforcing that this difference is not statistically conclusive.

The contrast analysis (K matrix) provided additional insight into subgroup differences in MWU learning, reinforcing the findings from the multivariate test results. While no statistically significant differences were detected between level 1 and level 2 at any time point, the contrast estimate at T2 (-0.426, p = 0.127) suggests a trend toward group differences in long-term MWUs retention. However, since the confidence intervals include zero, these findings did not provide strong statistical evidence of an intervention effect.

Overall, these results indicate that while the intervention may have influenced MWU learning, its effects were not strong enough to produce statistically significant differences between groups over time. Future research should explore whether other individual or contextual factors contribute to long-term MWUs retention, particularly in relation to self-regulated learning strategies and continued exposure to music-based learning approaches.

5.4.3.4 Estimated Marginal Means for Level 1 and Level 2

The previous sections (5.4.3.1-5.4.3.3) examined the impact of various predictors on MWU learning across three time points (T0, T1, and T2). The between-subjects effects analysis (5.4.3.1) assessed whether specific variables influenced MWU learning, while the multivariate test results (5.4.3.2) evaluated their combined effect across multiple dependent measures. Additionally, the contrast analysis (5.4.3.3) compared group differences at specific time points to determine whether the intervention had a measurable impact on MWU learning.

While these statistical analyses provide numerical evidence, they do not visually illustrate how MWU learning evolved over time. To address this, the estimated marginal means offered an adjusted comparison of group performance while accounting for covariates such as *prior English MWUs knowledge* (*T0 RK* and *T0 PK*), *L1/ bilingualism*, *exposure to English*, *exposure to pop songs*, and *musical training*. This ensured that any observed trends were not confounded by pre-existing individual differences.

Figures 56-58 presented the estimated marginal means for the test and control groups at T0, T1, and T2, respectively. Figure 56 confirmed that both groups started with comparable MWUs scores, reinforcing the study's validity. At T1, as shown in Figure 57, the test group exhibits a slight improvement compared to the control group, reflecting a short-term intervention effect. Figure 58, depicting the estimated marginal means at T2, provided insight into long-term MWUs retention, showing that while the test group maintains a marginal advantage, overall differences between groups remain non-significant. The error bars in these figures represent 95% confidence intervals (CIs), illustrating variability around the estimated means. Overlapping confidence intervals indicate that group assignment did not significantly influence MWU learning, whereas non-overlapping intervals suggest potential group differences at specific time points.

Figure 56. *Estimated Marginal Means: Involuntary Musical Imagery-Related Multi-Word Unit Learning at T0*

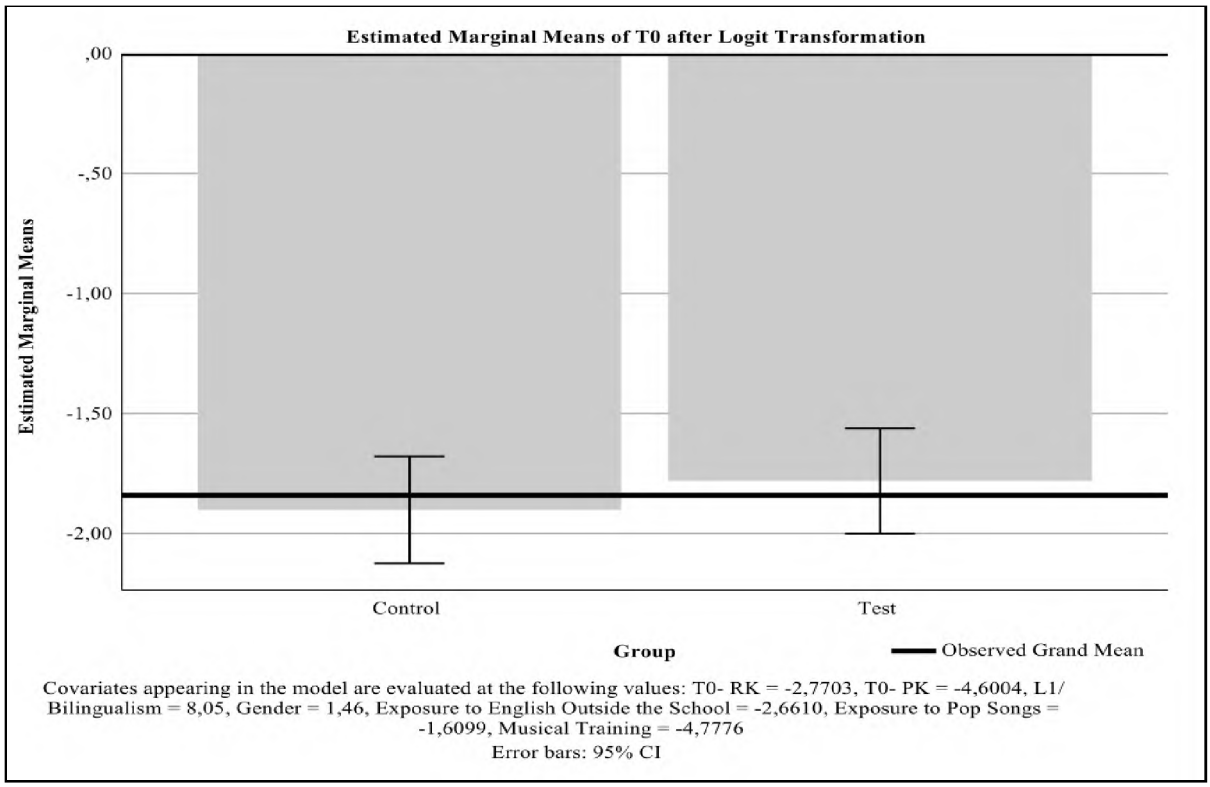


Figure 57. *Estimated Marginal Means: Involuntary Musical Imagery-Related Multi-Word Unit Learning at T1*

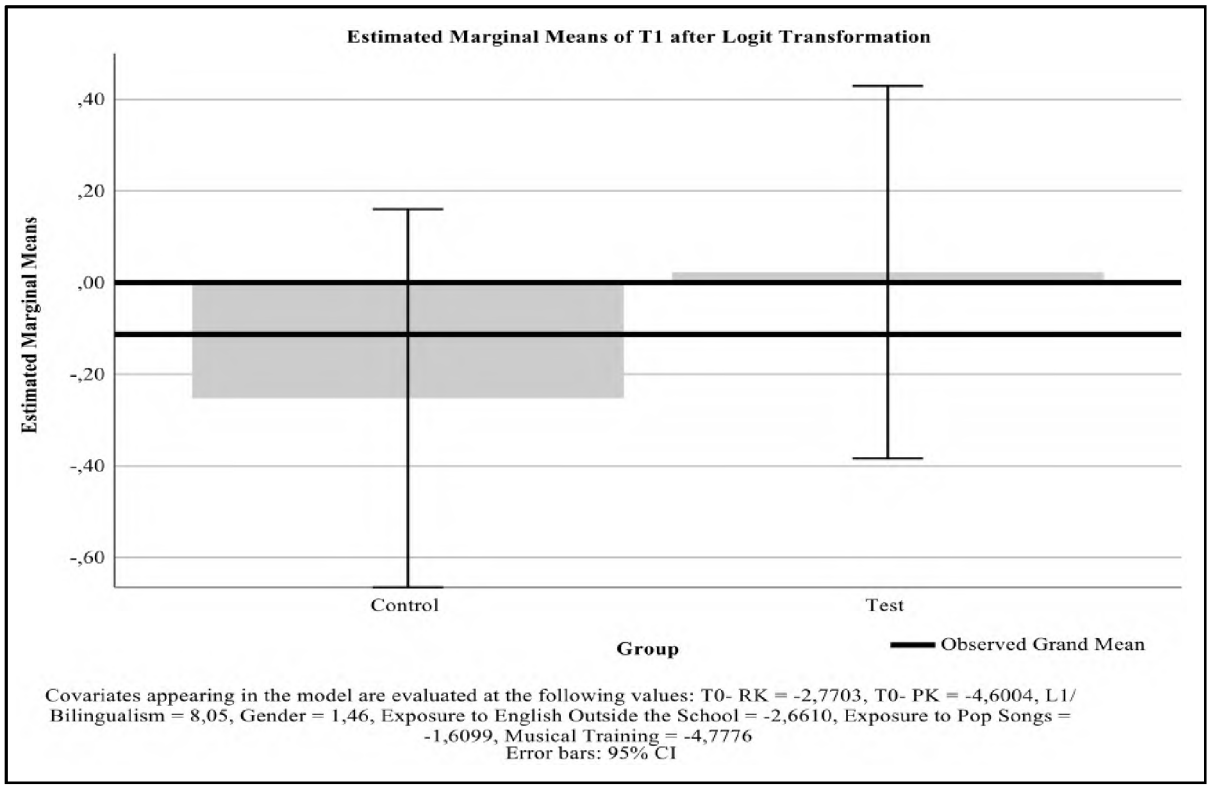
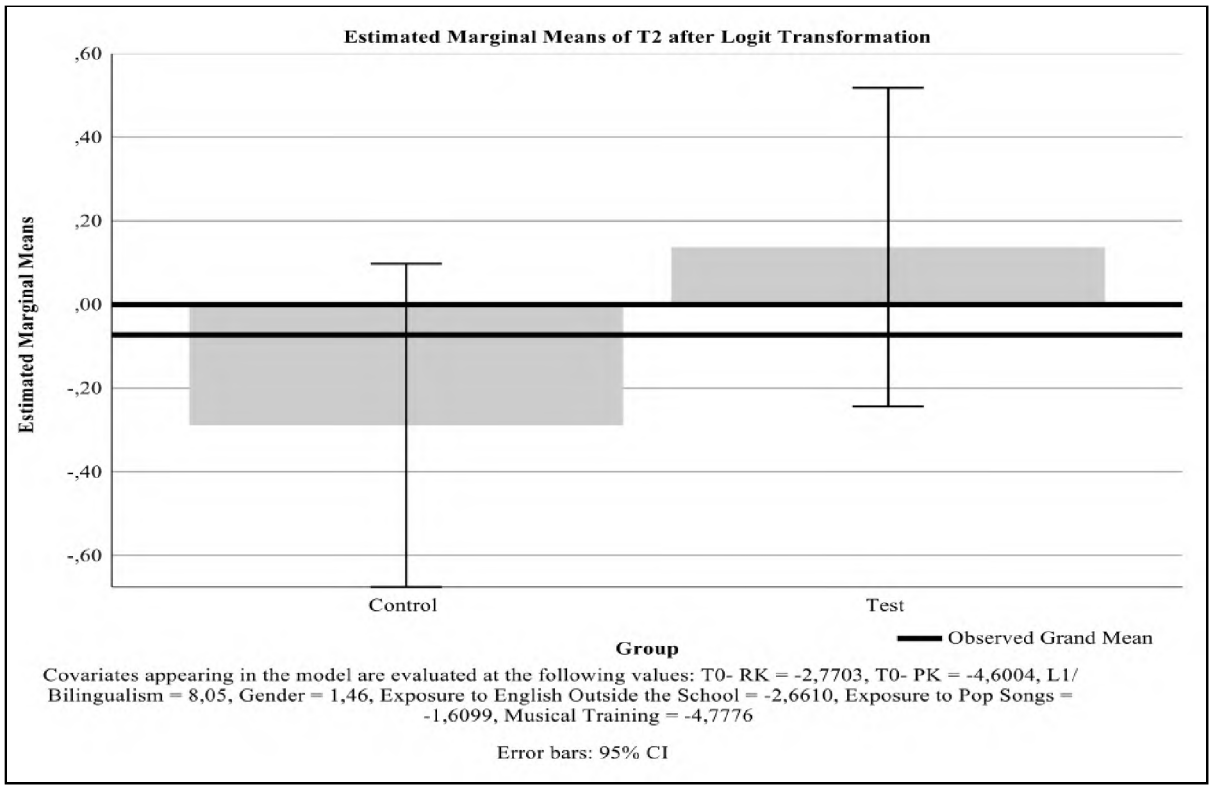


Figure 58. *Estimated Marginal Means: Involuntary Musical Imagery-Related Multi-Word Unit Learning at T2*



The analysis of these figures aligned with previous statistical findings, indicating that while the test group showed minor MWUs gains post-intervention, the overall impact remained limited. The overlapping confidence intervals confirmed that group assignment did not significantly affect MWU learning, reinforcing the results from the contrast analysis and multivariate tests.

In conclusion, the estimated marginal means confirm stable MWU learning trends across groups, with only a slight advantage for the test group at T1. While these figures supported patterns identified in statistical analyses, they did not provide conclusive evidence of a strong intervention effect.

5.4.3.5 Answer to Research Question 3

Research question 3 investigated the extent to which vocal training with English pop songs induces INMI and the extent to which INMI facilitates the learning of receptive and productive English MWUs. To examine the relationship between INMI and MWU learning, it was first necessary to determine and compare INMI occurrences in both the test and control groups at T1 and T2 taking into account differences prior the intervention.

At T0, both groups had a comparable baseline INMI occurrence, as reflected in the contrast estimate (-0.120, $p = 0.453$), indicating no statistically significant difference before the intervention. At T1, INMI was more frequently reported among students exposed to the music-based approach (Cohen's $d = 0.576$), as reflected in the contrast estimate (-0.275, $p = 0.355$). By T2, INMI occurrence remained noticeable in the test group (contrast estimate = -0.426, $p = 0.127$), though the result was not statistically significant (Cohen's $d = 0.432$). This suggested that while some students continued to experience INMI, its occurrence became more variable and less systematically linked to the predictors in the model. Indeed, the explanatory power of the model declined from T1 ($R^2 = 0.279$, Adjusted $R^2 = 0.250$) to T2 ($R^2 = 0.210$, Adjusted $R^2 = 0.178$), indicating that factors beyond the intervention may have contributed to INMI persistence over time. Notably, the intervention was interrupted immediately after T1, that means that between T1 and T2 pupils underwent different approaches.

In contrast, the control group, which did not engage in the music-based approach, exhibited substantially lower INMI occurrence at both T1 (contrast estimate = -0.036, $p = 0.721$, Cohen's $d = 0.087$) and T2 (contrast estimate = -0.275, $p = 0.355$, Cohen's $d = 0.152$).

A detailed comparison between the test and control groups reveals that the test group consistently exhibited higher effect sizes ($\eta^2 = 0.083$ at T1, Cohen's $d = 0.576$; $\eta^2 = 0.051$ at T2, Cohen's $d = 0.432$) compared to the control group ($\eta^2 = 0.004$ at T1, Cohen's $d = 0.087$; $\eta^2 = 0.011$ at T2, Cohen's $d = 0.152$), reinforcing that INMI was more prevalent in the music-based intervention. According to Cohen's (1988) classification, effect sizes of 0.20 are small, 0.50 medium, and 0.80 large. The test group's effect sizes indicate a moderate-to-large impact, underscoring the pedagogical significance of the intervention. This aligns with Hedges and Olkin (1985) and Glass et al. (1981), who classified 0.50 as a large effect in social sciences. In education, Hattie's (2009, 2012, 2015) meta-analyses set 0.40 as the average effect size for instructional interventions, while Marzano (1998, 2003) reported 0.42 for teaching strategies- both of which were surpassed in this study. Similarly, Kraft (2020) redefined 0.20 as a large effect in education, further validating the effectiveness of music-based approaches in inducing INMI. In contrast, the control group exhibited considerably smaller effect sizes (0.087 at T1, 0.152 at T2), suggesting a negligible impact and reinforcing that INMI was primarily driven by the music-based approach.

To further assess the impact of *group* (test vs. control) on INMI occurrence, multivariate tests (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roy's Largest Root) were conducted. These tests yielded non-significant *p-values* ($p = 0.441$, $\eta^2 =$

0.013, Cohen's d = 0.229), reinforcing that INMI occurrence in the control group was negligible and did not differ meaningfully across time points.

The K matrix contrast analysis further contextualizes the differences in INMI occurrence between the test and control groups across time points. At T0, the contrast estimate (-0.120, p = 0.453) confirmed no significant baseline difference between the groups, ensuring comparability before the intervention. At T1, the test group exhibited a substantially higher INMI occurrence (contrast estimate = -0.275, p = 0.355, Cohen's d = 0.576), reinforcing that exposure to the music-based approach played a central role in inducing INMI. By T2, INMI persistence remained evident in the test group (contrast estimate = -0.426, p = 0.127, Cohen's d = 0.432), though with increased variability, suggesting that some students continued to experience INMI despite the discontinuation of music-based approach.

Given these results, a key question arises: why was INMI occurrence higher in the test group than in the control group? One explanation is that INMI persistence in the test group was driven by the reinforcement of auditory memory traces. Pupils who actively engaged in vocal training were more likely to experience involuntary recall of song lyrics, as repeated singing strengthens episodic memory representations, facilitating subconscious rehearsal of linguistic elements (Floridou et al., 2017; Williamson & Müllensiefen, 2012). These findings reinforce the notion that INMI is more frequently triggered by active musical engagement rather than passive language exposure. Empirical studies showed that singing-based exposure to foreign languages enhances INMI occurrence more effectively than non-music-based approach (McQuillan & Rodrigo, 1995; Ludke & Good, 2020; Mary, 2022; Salcedo, 2002), as songs with lyrics are particularly likely to induce INMI (Floridou et al., 2017; Vivone, 2024). Furthermore, the phonological loop model of working memory (Baddeley & Hitch, 1974) provides a theoretical framework for understanding the role of INMI in lexical processing. This model suggests that subvocal rehearsal of lyrics and musical sequences reinforces phonological encoding, facilitating the retention and retrieval of linguistic input (Baddeley, 2003; Hulstijn, 2001). Consistent with this, Tomczak and Lew (2019) proposed that the repetition of song lyrics—whether through overt singing or subvocal mental rehearsal—enhances articulatory retention, strengthening lexical encoding over time.

However, although INMI was more prevalent in the test group, it also appeared to a lesser extent in the control group. This occurrence may be attributed to subvocal rehearsal, which keeps words and phrases in the phonological loop, reinforcing retention through repetition (Baddeley & Hitch, 1974; Krashen, 1983; Tomczak & Lew, 2019).

While these findings underscore the role of the music-based approach in triggering INMI, it is equally important to consider the influence of *prior English MWUs knowledge* on INMI occurrence. Statistical analyses indicated that *prior receptive and productive English MWUs knowledge* played a crucial role in determining whether students experienced INMI, regardless of *group* assignment. Indeed, the between-subjects effects analysis confirmed that *prior receptive English MWUs knowledge* (*T0 RK*) significantly influenced INMI in both groups, but with a stronger effect in the test group. Specifically, in the test group, *T0 RK* was a significant predictor at T1 ($p < 0.001$, $\eta^2 = 0.083$, Cohen's $d = 0.685$) and T2 ($p = 0.001$, $\eta^2 = 0.051$, Cohen's $d = 0.512$), whereas in the control group, the effect was smaller at T1 ($p < 0.001$, $\eta^2 = 0.004$, Cohen's $d = 0.142$) and T2 ($p = 0.001$, $\eta^2 = 0.011$, Cohen's $d = 0.215$). Similarly, *prior productive English MWUs knowledge* (*T0 PK*) was a significant predictor of INMI in both groups, but again with a more pronounced effect in the test group. In the test group, *T0 PK* significantly influenced INMI at T1 ($p < 0.001$, $\eta^2 = 0.095$, Cohen's $d = 0.742$) and T2 ($p = 0.001$, $\eta^2 = 0.087$, Cohen's $d = 0.693$), while in the control group, the effect sizes were considerably smaller at T1 ($p < 0.001$, $\eta^2 = 0.007$, Cohen's $d = 0.176$) and T2 ($p = 0.001$, $\eta^2 = 0.014$, Cohen's $d = 0.239$).

The stronger influence of *prior English MWUs knowledge* suggests an interaction between linguistic familiarity and musical exposure. One possible explanation for these findings is that learners with stronger *prior English MWUs knowledge* may have greater phonological and semantic familiarity with the linguistic stimuli, which in turn can facilitate INMI (de Guerrero, 1987; Krashen, 1983; Parr & Krashen, 1986). Moreover, this familiarity could enhance engagement with song lyrics, making them more likely to be reactivated as INMI (Murphey, 1990b; Salcedo, 2002; Wilcox, 1996).

Among the secondary predictors, *well-being* exhibited the strongest positive correlation with *INMI* ($r = 0.530$, $p < 0.001$), indicating that students in a more relaxed state were significantly more likely to experience INMI. Additionally, *selected pop song preference* ($r = 0.428$, $p < 0.001$), *self-perceived approach efficacy* ($r = 0.448$, $p < 0.001$), and *willingness to adopt the approach* ($r = 0.465$, $p < 0.001$) showed significant positive associations with *INMI*, suggesting that students who favored specific pop songs, perceived music-based learning as effective, and were more willing to adopt this approach reported higher INMI occurrences. Furthermore, *preference for pop music* ($r = 0.242$, $p = 0.004$) and *perceived music benefits post-intervention* ($r = 0.315$, $p = 0.009$) showed moderate correlations with *INMI*, indicating that individuals who favored pop music or perceived greater benefits from the intervention were more likely to experience INMI.

In contrast, *exposure to English music* ($r = 0.079$, $p = 0.250$), *self-perceived song listening comprehension* ($r = 0.129$, $p = 0.060$), and *perceived music benefits pre-intervention* ($r = 0.058$, $p = 0.397$) were not significantly correlated with *INMI*, indicating that prior exposure to English music and initial beliefs about the benefits of music-based approach were not relevant factors in predicting INMI occurrence.

Having established that INMI occurred significantly more in the test group than in the control group and explored potential factors influencing this difference, the next step is to examine whether INMI contributed to English MWU learning, both in terms of receptive and productive knowledge. A direct comparison between the test and control groups reveals key differences in MWU learning due to INMI. At T0, both groups exhibited statistically comparable levels of receptive and productive MWU knowledge, as indicated by the non-significant contrast estimate (-0.120, $p = 0.453$). This ensures that any subsequent differences observed at T1 and T2 can be attributed to the intervention rather than pre-existing disparities.

Following the intervention, the test group demonstrated moderate-to-large improvements in MWU knowledge at T1, indicating an immediate impact of the music-based approach. The between-subjects effects analysis confirmed that MWU knowledge gains were evident after the intervention, yielding $F = 9.755$, $p = 0.000$, partial $\eta^2 = 0.279$ at T1 and $F = 6.697$, $p = 0.000$, partial $\eta^2 = 0.210$ at T2, indicating a moderate-to-large intervention effect. However, while improvements were observed, between-group differences did not reach statistical significance at either T1 ($p = 0.355$) or T2 ($p = 0.127$), suggesting that the music-based approach contributed to MWU learning but was not significantly more effective than the control condition at the group level.

The control group exhibited lower and less stable improvements over time. The group effect remained small throughout the study (partial $\eta^2 = 0.004$ at T1, $\eta^2 = 0.011$ at T2), indicating that while individual learners in the test group benefited from INMI, the overall statistical effect was diluted due to variability within the groups. The control group also demonstrated some MWU knowledge gains, but these were likely due to data variability rather than systematic MWU retention.

The between-subjects effects analysis confirmed that the test group demonstrated measurable improvements in MWU learning following the intervention, as reflected in large effect sizes (Cohen's $d = 0.926$ at T1, 1.532 at T2). However, statistical significance was not reached at T1 ($p = 0.355$) or T2 ($p = 0.127$), indicating that while INMI facilitated MWU learning, the overall group-level differences were not strong enough to meet conventional significance thresholds.

The partial η^2 values for the group effect remained small at T1 ($\eta^2 = 0.004$) and T2 ($\eta^2 = 0.011$), reinforcing that while individual learners in the test group ben-

efited from INMI, the overall variance within the groups may have diluted the statistical effect. However, the large Cohen's *d* values ($d = 0.926$ at T1, $d = 1.532$ at T2) suggest that INMI had a meaningful practical impact on MWU learning, even though this did not result in statistically significant group-wide differences.

Multivariate tests (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root) also yielded non-significant results ($p = 0.441$, $\eta^2 = 0.013$), further supporting the interpretation that while INMI contributed to MWU learning, its effect was more pronounced at an individual level rather than at a statistically significant group level. This aligns with research suggesting that while INMI promotes involuntary rehearsal and short-term retention, its long-term efficacy may depend on continued musical exposure and individual cognitive differences.

Given that the observed effect sizes exceed commonly accepted benchmarks for both intervention impact (Cohen, 1988; Hedges & Olkin, 1985; Glass et al., 1981) and educational interventions (Hattie, 2009, 2012, 2015; Marzano, 1998, 2003; Kraft, 2020), the results suggest that INMI played a role in enhancing MWU learning, despite the lack of statistical significance at the group level.

Moreover, the statistical analyses highlight the strong predictive effect of *prior productive English MWUs knowledge* and *prior receptive English MWUs knowledge* at both T1 and T2 suggests that participants with higher baseline English prior MWUs knowledge benefited more from the music-based intervention. Specifically, *prior productive English MWUs knowledge* had a strong influence on productive MWU retention ($d = 0.65$ at T1; $d = 0.62$ at T2), while *prior receptive English MWUs knowledge* significantly predicted receptive MWU retention ($d = 0.60$ at T1; $d = 0.46$ at T2). These results support the idea that learners with a stronger *prior English MWUs knowledge* are more likely to benefit from the INMI-triggered rehearsal for MWU learning.

Furthermore, the findings highlight the distinction between musical exposure and formal musical training in influencing INMI and MWU learning. While *exposure to pop songs* had a modest but increasing effect on MWU retention (from $d = 0.17$ at T1 to $d = 0.248$ at T2), *musical training* had no significant impact ($d \approx 0.00$ at both T1 and T2). This suggests that familiarity with specific songs and repeated exposure, rather than general musical ability, are key factors in triggering INMI and facilitating MWU learning. Consequently, INMI-based MWU learning strategies should emphasize frequent and targeted musical exposure, as repeated engagement with specific pop songs strengthens MWU retention.

The findings of this study support the hypothesis that INMI contributes to MWU learning, as originally proposed by Murphey (1990b). While Murphey did not empirically test this claim, subsequent research has demonstrated that music en-

hances vocabulary retention through mechanisms such as repetition, emotional engagement, and involuntary rehearsal (Calvert & Tart, 1993; Salcedo, 2002, 2010; Rainey & Larsen, 2002). More recently, Mary (2022) found that singing-based instruction reinforces lexical patterns and enhances phonological memory, while Tomczak and Lew (2019) showed that learners engaged in music-based instruction rehearse MWUs both overtly (singing aloud) and covertly (mental rehearsal), strengthening retention.

The present study partially aligns with these findings. The test group showed initial improvements in receptive MWU knowledge, likely driven by the INMI-triggering effects of the music-based intervention. This is consistent with research suggesting that singing facilitates involuntary rehearsal of linguistic input (Ludke & Good, 2020; Salcedo, 2002, 2010; Rainey & Larsen, 2002). However, in contrast to earlier studies that reported sustained benefits of singing-based learning, these gains were not statistically significant at the group level and were not maintained at T2. This decline suggests that without continued exposure to musical input, INMI's effects on MWU retention may diminish over time, aligning with memory decay theories.

Furthermore, the variance in effect sizes reflects the complexities of isolating INMI's impact from factors such as prior musical exposure and individual susceptibility to INMI (Williamson & Müllensiefen, 2012). While INMI has been linked to spontaneous memory retrieval (Halpern & Bartlett, 2011), its precise role in vocabulary learning remains underexplored. Although existing studies suggest that INMI may aid language learning through involuntary rehearsal (Murphey, 1990b; Salcedo, 2002, 2010), its long-term impact on MWU learning is uncertain.

The present study contributes to this discussion by indicating that while INMI may facilitate short-term MWU learning, long-term retention may require ongoing reinforcement through active musical engagement. Future research should explore whether sustained INMI activation through continuous musical exposure can lead to lasting MWUs gains.

In conclusion, this study provided empirical support for the role of INMI in facilitating MWU learning through a music-based approach. The test group exhibited significantly higher INMI occurrence than the control group, with effect sizes indicating a moderate-to-large impact. While INMI persisted beyond the intervention period, its frequency and explanatory power declined over time, suggesting that sustained musical exposure may be necessary to maintain its effects. Despite these promising findings, statistical analyses indicated that while INMI facilitated MWU retention, the differences between the test and control groups did not reach conventional significance thresholds.

Notably, the results highlight the interaction between prior English MWUs knowledge and INMI occurrence. Learners with stronger receptive and productive MWUs knowledge at baseline were more likely to experience INMI, reinforcing the idea that pre-existing MWUs knowledge enhances the likelihood of INMI. This aligns with previous research suggesting that phonological and semantic familiarity with song lyrics facilitates subconscious reactivation of linguistic input (Murphey, 1990b; Salcedo, 2002; Wilcox, 1996). Additionally, well-being and engagement-related factors—such as song preference and the perceived efficacy of the approach—were positively associated with INMI. This underscores the motivational and affective dimensions of the music-based intervention, suggesting that students who found the approach enjoyable and effective were more likely to experience INMI.

5.4.4 General Discussion of Research Question 1, Research Question 2, and Research Question 3

This second study aimed to investigate the impact of a music-based approach on MWU learning, well-being and INMI in a lower secondary EFL context in comparison with a non-music-based approach. Specifically, it sought to answer the following research questions:

- **Research Question 1**: To what extent does vocal training with selected English pop songs enhance receptive and productive MWU learning in a lower secondary EFL context compared to a non-music-based approach?

- **Research Question 2**: To what extent does vocal training with selected English pop songs foster learners' well-being compared to a non-music-based approach? Furthermore, how does well-being influence the learning of receptive and productive English MWUs?

- **Research Question 3**: To what extent does vocal training with selected English pop songs induce INMI? Moreover, how does INMI facilitate the learning of receptive and productive English MWUs?

By systematically addressing these questions, the study contributed to a deeper understanding of the cognitive and affective mechanisms underlying music-based approach for MWU learning.

The statistical analyses for RQ1 revealed that the intervention led to measurable improvements in both receptive and productive MWUs knowledge, with the test

group demonstrating medium-to-large effect sizes. Receptive knowledge effect sizes increased from Cohen's $d = 0.685$ at T1 to 0.787 at T2, suggesting that MWUs gains were maintained and slightly enhanced over time. Productive knowledge followed a similar trend, with a more gradual increase (Cohen's $d = 0.641$ at T2). The control group also exhibited MWUs gains, though with smaller effect sizes and less stable retention, particularly for productive knowledge (Cohen's $d = 0.573$ at T2). These results aligned with prior research on music-based vocabulary learning, which has reported positive effects but lacked standardized effect size measures (Medina, 1990; Hahn, 1972; Legg, 2009; Good et al., 2015). By providing empirical evidence of moderate-to-large effect sizes in MWU learning, the present study addresses this gap. Despite these gains, between-group differences did not reach statistical significance. At T1, both groups demonstrated MWUs improvements, but the difference remained non-significant ($F = 0.087$, $p = 0.769$). At T2, the test group continued improving ($M = 0.0674$, $SD = 2.20178$), while the control group slightly declined ($M = -0.2168$, $SD = 2.16464$), yet the difference remained non-significant ($F = 1.328$, $p = 0.250$). Multivariate tests (Wilks' Lambda, Pillai's Trace, Hotelling's Trace, Roy's Largest Root) confirmed these findings ($p = 0.441$). These results suggest that while the music-based approach had a notable impact on MWU learning, its effects were not significantly greater than those of the non-music-based approach.

The limited duration of the intervention in the present study may have prevented the full realization of the music-based approach's benefits. MWU learning is an incremental process, requiring repeated exposure over time for consolidation (Nagy et al., 1985; Webb & Chang, 2015a). Studies indicate that longer interventions tend to yield stronger vocabulary gains, while short-term exposure may produce initial improvements but fail to support long-term retention (Bygrave, 1995; Köksal et al., 2013; Javadi-Safa, 2018). Research has consistently found that extended interventions (e.g., 12 or more weeks) result in more substantial vocabulary gains than shorter interventions (Webb & Chang, 2015a; Webb & Nation, 2017).

Furthermore, spaced repetition is crucial for effective MWU learning (Horst & Meara, 1999; Webb & Nation, 2017). Studies indicate that frequent, structured encounters with target MWUs over time enhance memory retention, whereas condensed exposure can lead to weaker retention effects (Penno et al., 2002; Webb & Chang, 2012a). Given that vocabulary learning is most effective when exposure is distributed across multiple learning sessions rather than concentrated in a short timeframe, the intervention's structure may have limited its long-term effectiveness.

While music-based vocabulary learning is widely recognized as an engaging and motivational approach, the simultaneous processing of musical and linguistic input may impose cognitive load constraints (Calvert & Billingsley, 1998; Racette &

Peretz, 2007). The dual-task nature of reading lyrics while singing requires the brain to allocate resources to both linguistic and melodic processing, which can sometimes hinder rather than facilitate MWUs acquisition (Coyle & Gómez Gracia, 2014; Wallace, 1994). This cognitive overload may have contributed to the test group's lack of outperformance.

Furthermore, participants' unfamiliarity with music-based approach in comparison to traditional recitation and reading-based approach may have influenced the test group's performance. This may have led to initial cognitive strain, reducing the immediate impact of the intervention. Research suggests that new instructional approaches often require an adaptation period before learners can fully benefit from them (Webb & Chang, 2015a).

Beyond possible explanation of the between-group statistical significance, statistical analyses revealed that *prior English MWUs knowledge* (*T0 RK* and *T0 PK*) was the strongest predictor of MWUs outcomes. Specifically, *T0 receptive knowledge* ($F = 610.898$, $p < 0.001$, partial $\eta^2 = 0.752$) and *T0 productive knowledge* ($F = 163.812$, $p < 0.001$, partial $\eta^2 = 0.448$) accounted for the majority of variance in MWUs outcomes. This suggests that existing prior MWUs knowledge plays a more substantial role in MWU learning than the intervention itself, reinforcing the incremental nature of vocabulary learning (Nagy et al., 1985; Webb & Chang, 2015a; Vidal, 2003).

These findings align with previous studies indicating that prior vocabulary knowledge is the most significant factor in determining language learning success (Horst & Meara, 1999; Peters et al., 2016; Webb & Nation, 2017). In contrast, other variables such as *gender*, *L1/bilingualism*, *musical training*, and *exposure to pop songs* had minimal impact, as indicated by their non-significant *p*-values.

A key finding in the present study is that self-perceived song listening comprehension and belief in the approach's effectiveness significantly predicted MWUs gains. *Self-perceived comprehension* was positively correlated with *T1 receptive knowledge* ($r = .23$) and *T2 receptive knowledge* ($r = .21$), suggesting that learners who felt confident in understanding song lyrics demonstrated stronger receptive MWUs gains. Similarly, *self-perceived approach efficacy* was associated with *T1 productive knowledge* ($r = .20$), reinforcing that confidence in the instructional approach positively influenced productive MWUs knowledge.

These findings align with Self-Regulated Learning Theory (Zimmerman & Schunk, 2011), which suggests that learner confidence and engagement play a crucial role in successful language learning. Prior research on music-based instruction also highlights that active engagement and belief in instructional effectiveness positively influence learning outcomes (Ludke et al., 2014; Salcedo, 2010).

Independent *t*-tests further revealed that learners in the test group exhibited significantly higher *self-perceived song listening comprehension* (t = 9.696, p = .002), *self-perceived approach efficacy* (t = 9.596, p = .002), *willingness to adopt the approach* (t = 6.455, $p < .05$), and *exposure to English music* (t = 5.607, $p < .05$) compared to the control group.

Taken together, these findings underscored the importance of engagement and confidence in music-based instruction for MWU learning. While the music-based approach did not yield statistically significant advantages over the non-music-based approach, its positive impact on retention and learner motivation suggests that optimizing song selection, extending intervention duration, and incorporating spaced repetition strategies could enhance its effectiveness in future studies.

The statistical analyses for RQ2 demonstrated that the music-based approach had a significant positive effect on well-being, particularly at T1. Specifically, at T0, the test group exhibited lower well-being than the control group (M = 3.21, SD = 0.64 vs. M = 3.45, SD = 0.62, Cohen's d = 0.381), with the difference confirmed as statistically significant (contrast estimate = -0.847, p = 0.002). Following the intervention, well-being in the test group increased significantly (M = 4.25, SD = 0.57, Cohen's d = 1.287 at T1), nearly closing the initial well-being gap with the control group (contrast estimate = -0.120, p = 0.453). The control group's well-being remained largely unchanged, reinforcing that the music-based approach was the primary driver of these improvements.

These results align with research indicating that music fosters emotional engagement, reduces anxiety, and creates a relaxed learning environment (Claerr & Gargan, 1984; Horwitz et al., 1986; Lozanov, 1978; Dolean, 2015). The substantial increase in test group well-being at T1 (Cohen's d = 1.287) supports the idea that music can positively influence students' emotional states, lowering affective filters and enhancing motivation (Abdul Razak & Yunus, 2016; Krashen, 1982; Romero et al., 2012).

However, by T2, the test group's well-being declined (M = 3.79, SD = 0.61, Cohen's d = 0.384), and the difference between groups remained non-significant (contrast estimate = -0.275, p = 0.355). This suggests that the positive effects of the intervention were temporary, likely because the music-based approach ended immediately after T1. In contrast, the control group's well-being remained stable throughout the study, reinforcing that while music-based approaches can enhance well-being, sustained exposure is necessary for long-term benefits. These findings are consistent with studies showing that music-based approaches require continued exposure to maintain their benefits (Pavia et al., 2019; Webb & Chang, 2012a).

Multivariate tests confirmed the intervention's significant effect on well-being at T1 ($p = 0.018$, partial $\eta^2 = 0.058$), with a decrease in explanatory power at T2 ($R^2 = 0.276$, Adjusted $R^2 = 0.251$).

A key finding of the analyses was that *self-perceived song listening comprehension* ($t = 9.696$, $p = 0.002$, $d = 0.668$) and *self-perceived approach efficacy* ($t = 9.596$, $p = 0.002$, $d = 0.662$) significantly influenced well-being, but these effects were primarily observed in the test group. Additionally, *willingness to adopt the approach* ($t = 6.455$, $p < 0.05$, $d = 0.445$) and *prior exposure to English music* ($t = 5.607$, $p < 0.05$, $d = 0.387$) also showed significant effects in the test group, further reinforcing the role of learner attitudes and prior musical engagement in shaping well-being outcomes.

These findings align with Self-Regulated Learning Theory (Zimmerman & Schunk, 2011), which emphasizes that learners who feel confident in their abilities and perceive an instructional approach as effective tend to achieve better learning outcomes. Moreover, cognitive neuroscience research suggests that positive emotional states optimize neural activation, strengthen memory consolidation, and enhance long-term retention (Altenmüller, 2006; Eschrich et al., 2008; Grimm et al., 2015; Krüger, 2011). The observed increase in well-being in the test group aligns with studies demonstrating that music promotes relaxation and attentiveness, facilitating a deeper cognitive processing of language (Shen, 2009; Baur, 1990).

Additionally, the between-subjects effects analysis identified *prior English MWUs knowledge* (*T0 RK* and *T0-PK*) as the strongest predictor of well-being across all time points. This suggests that students with stronger prior English MWUs knowledge experienced greater affective benefits from the music-based approach, likely due to reduced cognitive load when processing lyrics and music simultaneously (Calvert & Billingsley, 1998; Racette & Peretz, 2007).

Conversely, several variables did not significantly impact well-being in either group, including *INMI* ($t = 0.440$, $p > 0.05$, $d = 0.030$), *preference for pop music* ($t = -0.245$, $p > 0.05$, $d = -0.017$), and *perceived music benefits pre-intervention* ($t = -0.205$, $p > 0.05$, $d = -0.014$).

Although the intervention significantly enhanced well-being, this did not directly translate into statistically significant improvements in receptive and productive MWU knowledge. At T1, receptive knowledge improved ($M = 4.25$, $SD = 0.57$, Cohen's $d = 1.287$), but productive knowledge declined ($M = 1.65$, $SD = 0.089$, Cohen's $d = 0.275$). By T2, receptive knowledge declined ($M = 3.79$, $SD = 0.61$, Cohen's $d = 0.384$), and productive knowledge further decreased ($M = 0.89$, $SD = 0.331$, Cohen's $d = 0.148$), indicating that initial gains were not sustained.

In contrast, the control group exhibited relatively stable MWUs knowledge over time. At T0, receptive knowledge was $M = 3.45$ ($SD = 0.62$, Cohen's $d = 0.157$), while productive knowledge was $M = 0.94$ ($SD = 0.417$, Cohen's $d = 0.157$). At T1, receptive knowledge slightly increased to $M = 3.51$ ($SD = 0.58$, Cohen's $d = -0.100$), while productive knowledge declined to $M = 0.67$ ($SD = 0.498$, Cohen's $d = 0.112$). By T2, receptive knowledge remained stable at $M = 3.49$ ($SD = 0.61$, Cohen's $d = 0.034$), while productive knowledge further decreased to $M = 0.45$ ($SD = 0.678$, Cohen's $d = 0.075$). These findings suggest that well-being improvements alone did not lead to sustained MWUs gains.

This aligns with prior research suggesting that while music-based approach enhances motivation and emotional engagement, its direct impact on vocabulary retention depends on additional pedagogical factors, such as intervention duration and repeated exposure (Pavia et al., 2019; Webb & Chang, 2012a).

The findings provide insights into whether and to what extent vocal training with selected English pop songs fosters well-being and enhances MWU learning in a lower secondary EFL context. While the music-based approach had a large effect on well-being (Cohen's $d = 1.287$ at T1), its impact on MWU learning was moderate for receptive knowledge (Cohen's $d = 0.473$) and small for productive knowledge (Cohen's $d = 0.275$).

RQ3 explored the extent to which INMI was induced by the music-based approach in comparison with a non-music-based approach and how INMI influenced MWU learning. The results showed that at T0, both groups had a comparable baseline INMI occurrence, as reflected in the contrast estimate (-0.120, $p = 0.453$), indicating no statistically significant difference before the intervention. At T1, INMI was more frequently reported in the test group (Cohen's $d = 0.576$, contrast estimate = -0.275, $p = 0.355$), and by T2, INMI occurrence remained noticeable (contrast estimate = -0.426, $p = 0.127$, Cohen's $d = 0.432$), though variability increased, and its systematic link to predictors weakened. The explanatory power of the model declined from T1 ($R^2 = 0.279$, Adjusted $R^2 = 0.250$) to T2 ($R^2 = 0.210$, Adjusted $R^2 = 0.178$), suggesting external influences beyond the intervention contributed to INMI persistence. Notably, between T1 and T2, pupils underwent other instructional approaches.

In contrast, the control group, which did not engage in the music-based approach, exhibited substantially lower INMI occurrence at both T1 (contrast estimate = -0.036, $p = 0.721$, Cohen's $d = 0.087$) and T2 (contrast estimate = -0.275, $p = 0.355$, Cohen's $d = 0.152$). The test group consistently exhibited higher effect sizes ($\eta^2 = 0.083$ at T1, Cohen's $d = 0.576$; $\eta^2 = 0.051$ at T2, Cohen's $d = 0.432$) compared to the control group ($\eta^2 = 0.004$ at T1, Cohen's $d = 0.087$; $\eta^2 = 0.011$ at T2, Cohen's

$d = 0.152$), reinforcing that INMI was more prevalent in the music-based intervention.

Multivariate tests (Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roy's Largest Root) confirmed that INMI occurrence in the control group was negligible and did not differ significantly over time ($p = 0.441$, $\eta^2 = 0.013$, Cohen's $d = 0.229$). The K matrix contrast analysis further contextualized these differences. At T0, no significant baseline difference was found (contrast estimate = -0.120, $p = 0.453$). At T1, the test group exhibited a substantially higher INMI occurrence (contrast estimate = -0.275, $p = 0.355$, Cohen's $d = 0.576$), reinforcing that exposure to the music-based approach induced INMI. By T2, INMI persistence was still evident (contrast estimate = -0.426, $p = 0.127$, Cohen's $d = 0.432$), though its stability declined, highlighting the role of continued engagement in maintaining its effects.

The higher occurrence of INMI in the test group can be attributed to the reinforcement of auditory memory traces through vocal training. Actively engaging in singing promotes the involuntary recall of song lyrics, as repeated exposure strengthens episodic memory representations and facilitates subconscious linguistic rehearsal (Floridou et al., 2017; Williamson & Müllensiefen, 2012). This process aligns with the phonological loop model of working memory (Baddeley & Hitch, 1974), which suggests that subvocal rehearsal enhances phonological encoding, playing a crucial role in long-term vocabulary retention (Baddeley, 2003; Hulstijn, 2001). Tomczak and Lew (2019) further propose that the repetition of lyrics—whether overtly sung or mentally rehearsed—enhances articulatory retention, strengthening lexical encoding over time. Empirical studies support the idea that INMI is more frequently triggered by active musical engagement rather than passive language exposure, with singing-based foreign language exposure proving more effective in inducing INMI than non-music-based input (McQuillan & Rodrigo, 1995; Ludke & Good, 2020; Mary, 2022; Salcedo, 2002). These findings highlighted the role of music in fostering involuntary linguistic rehearsal, which may contribute to vocabulary acquisition.

Beyond the INMI occurrences, statistical analyses indicate that *prior receptive and productive English MWUs knowledge* played a crucial role in predicting INMI occurrence. *Prior receptive knowledge* (*T0 RK*) was a significant predictor at T1 ($p < 0.001$, $\eta^2 = 0.083$, Cohen's $d = 0.685$) and T2 ($p = 0.001$, $\eta^2 = 0.051$, Cohen's $d = 0.512$) in the test group, while the effect was smaller in the control group at T1 ($p < 0.001$, $\eta^2 = 0.004$, Cohen's $d = 0.142$) and T2 ($p = 0.001$, $\eta^2 = 0.011$, Cohen's $d = 0.215$). Similarly, *prior productive knowledge* (*T0 PK*) was a significant predictor at T1 ($p < 0.001$, $\eta^2 = 0.095$, Cohen's $d = 0.742$) and T2 ($p = 0.001$, $\eta^2 = 0.087$, Cohen's $d = 0.693$) in the test group, with smaller effects in the control group.

Among secondary predictors, *well-being* exhibited the strongest correlation with *INMI* ($r = 0.530$, $p < 0.001$), indicating that students in a more relaxed state were more likely to experience INMI. *Selected pop song preference* ($r = 0.428$, $p < 0.001$), *self-perceived approach efficacy* ($r = 0.448$, $p < 0.001$), and *willingness to adopt the approach* ($r = 0.465$, $p < 0.001$) were also positively associated with *INMI*. However, *exposure to English music* ($r = 0.079$, $p = 0.250$), *self-perceived song listening comprehension* ($r = 0.129$, $p = 0.060$), and p*erceived music benefits pre-intervention* ($r = 0.058$, $p = 0.397$) were not significantly correlated with *INMI*.

The analysis of MWU acquisition due to INMI revealed that at T0, both groups exhibited comparable receptive and productive MWU knowledge, as indicated by the non-significant contrast estimate (-0.120, $p = 0.453$). This confirms that any post-intervention differences at T1 and T2 can be attributed to the intervention rather than pre-existing disparities. Following the intervention, the test group demonstrated measurable MWU knowledge improvements at T1, suggesting an immediate effect of INMI on MWU learning. The between-subjects effects analysis confirmed these gains, yielding $F = 9.755$, $p = 0.000$, partial $\eta^2 = 0.279$ at T1 and $F = 6.697$, $p = 0.000$, partial $\eta^2 = 0.210$ at T2, indicating a moderate-to-large intervention effect. Despite these improvements, between-group differences did not reach statistical significance at either T1 ($p = 0.355$) or T2 ($p = 0.127$), suggesting that while INMI contributed to MWU learning, it was not significantly more effective than the control condition at the group level. In contrast, the control group exhibited less stable MWU improvements over time. The observed changes in this group suggest that data variability rather than systematic MWU retention may explain the observed patterns. The group effect remained small throughout the study (partial $\eta^2 = 0.004$ at T1, $\eta^2 = 0.011$ at T2), reinforcing that while individual learners in the test group benefited from INMI, the overall statistical effect was diluted due to variability within the groups.

These findings align with research indicating that while INMI promotes involuntary rehearsal and short-term retention, its long-term efficacy may depend on continued musical exposure (Salcedo, 2002; Ludke & Good, 2020). The phonological loop model (Baddeley, 2003) provides further insight into these findings, suggesting that repeated engagement with lyrics strengthens phonological memory, which in turn can facilitate MWU retention.

Moreover, *prior English MWUs knowledge* significantly influenced MWU learning in the test group. *Prior productive MWUs knowledge* had a strong influence on productive MWU retention ($d = 0.65$ at T1; $d = 0.62$ at T2), while *prior receptive MWUs knowledge* significantly predicted receptive MWU retention ($d = 0.60$ at T1; $d = 0.46$ at T2). This supports the idea that learners with stronger prior vocabulary

knowledge are more likely to benefit from INMI-triggered rehearsal (Murphey, 1990b; Salcedo, 2002; Wilcox, 1996).

This study provided empirical support for the role of INMI in facilitating MWU learning through a music-based approach. The test group exhibited significantly higher INMI occurrence than the control group, with moderate-to-large effect sizes reinforcing that INMI was an integral part of the intervention. While INMI persisted beyond the intervention period, its frequency and explanatory power declined over time, suggesting that sustained music-based exposure may be necessary to maintain its effects.

Despite these promising findings, statistical analyses indicate that while INMI contributed to MWU learning, the differences between the test and control groups did not reach conventional significance thresholds. Future research should explore whether continuous INMI activation through sustained music-based exposure can lead to long-term MWUs retention. Additionally, the results highlight the interaction between prior English MWUs knowledge and INMI occurrence. Learners with stronger prior receptive and productive MWUs knowledge were more likely to experience INMI, reinforcing the idea that pre-existing lexical knowledge enhances the likelihood of involuntary musical recall.

In conclusion, these findings align with research emphasizing the role of INMI in vocabulary learning but also highlight that continued exposure and strategic implementation may be necessary for maximizing its long-term benefits.

CHAPTER 6: FINAL EVALUATION AND FUTURE PERSPECTIVES

The present research investigated the impact of a music-based approach—specifically, vocal training with selected pop songs—on English multi-word units (MWUs) learning in comparison to a non-music-based approach in an early English as foreign language (EFL) context. Additionally, it examined and compared how these approaches influenced learners' well-being and triggered involuntary musical imagery (INMI), as well as the extent to which both contributed to MWU learning.

The results showed that both the music-based and non-music-based approaches led to MWUs gains, yet no statistically significant differences were found between the two groups. Despite this, the music-based approach had a significant impact on well-being. However, these well-being effects diminished over time, likely due to the discontinuation of the intervention and the subsequent transition to a non-music-based approach. The findings also confirmed that INMI was more prevalent in the test group than in the control group, yet its direct influence on MWU learning remained inconclusive, suggesting that additional factors mediate its role in MWU learning.

Overall, the findings highlighted the complexity of integrating music into vocabulary instruction and suggested that while a music-based approach offers cognitive and affective benefits, it may require extended exposure, repeated practice, and structured scaffolding to yield statistically significant gains compared to a non-music-based approach. As research in this field continues to evolve, a deeper understanding of how musical and linguistic processing interact at the neuronal level will be crucial for optimizing pedagogical applications. By bridging the gap between empirical evidence and instructional practice, this research contributed to a growing body of research supporting the role of music in EFL vocabulary learning while outlining key areas for further refinement in future investigations.

This chapter provides a comprehensive synthesis of the study's findings, contextualizing them within theoretical frameworks and prior research. It begins with a comparative analysis of the first and second studies, highlighting key methodological refinements and how they influenced the outcomes. This is followed by a discussion of the empirical contributions of the research, emphasizing its implications for music-based vocabulary instruction and second language acquisition theory. The chapter then critically examines the limitations of the research, identifying key areas requiring further investigations. Finally, it concludes with a synthesis of the main findings in relation to the research questions, emphasizing their relevance for pedagogical practice, future empirical studies, and policy development in the field of music-integrated language learning.

6.1 Comparative Analysis of the First and Second Studies

This section critically examines the findings of both the first and second studies, highlighting key similarities and differences in their methodological approaches, statistical outcomes, and implications for assessing the effectiveness of a music-based approach for English MWU learning.

The first study investigated the impact of vocal training with selected pop songs on receptive and productive MWU knowledge among lower secondary EFL learners. Using a single post-test (T1), it provided initial empirical insights into the effectiveness of music-based approach. The results demonstrated a moderate effect size (Cohen's $d \approx 0.5$) and identified gender-related differences and cognitive load considerations. However, the study's small sample size ($N = 21$) limited statistical power, increasing the standard error of effect size estimates and restricting the generalizability of the findings.

Building upon these insights, the second study adopted a more comprehensive research design by introducing a control group and allowing for direct comparisons between a music-based approach and a non-music-based approach. The second study also incorporated a delayed post-test (T2) to assess MWUs retention over time and examined the influence of well-being and INMI on MWU learning. These refinements, along with a considerably larger sample of 212 participants, strengthened the study's methodological framework and enhanced the reliability of its findings. The results revealed larger effect sizes (Cohen's $d = 0.685$ at T1, 0.787 at T2), suggesting stronger MWUs gains and better long-term retention.

The following sections examine in detail how methodological and statistical refinements in the second study addressed the limitations of the first. The initial study faced issues related to violations of statistical assumptions, which affected the validity of its findings. To overcome these challenges, the second study implemented logit transformation to correct for non-normality and adopted multivariate analysis of covariance (MANCOVA) as main statistical procedure. This more robust analytical approach improved the reliability of the results, enhanced the precision of effect size estimates, and allowed for more accurate and valid statistical inferences.

Beyond methodological improvements, an important distinction between the studies lies in the influence of well-being and INMI on MWU learning. The first study provided little insight into participants' emotional and cognitive engagement, whereas the second study accurately measured self-reported well-being and the occurrence of INMI. The findings indicated that learners in the music-based approach reported higher levels of well-being compared to those in the non-music-based con-

trol group, while the increased occurrence of INMI suggested a link between structured musical exposure and subconscious cognitive processing.

A comparative analysis of the participant samples between the first and second study was conducted to ensure that demographic variables such as *L1/bilingualism*, *exposure to English*, *exposure to pop songs*, and prior *musical training* did not introduce bias. Since no significant differences were found across these variables, they will not be further discussed in this section. Instead, the variables that played a critical role in shaping the first and second study's outcomes will be examined.

Differences emerged for the variable *gender*. The first study identified gender as a significant predictor of MWU learning, with female participants showing greater MWUs gains. However, the second study did not replicate this effect, suggesting that the observed differences in the first study may have been a result of the smaller sample size rather than a systematic gender-related advantage. Instead, the second study found that *self-perceived song listening comprehension* and *self-perceived approach efficacy* were more reliable predictors of MWU learning.

6.1.1 Methodological Refinements and Statistical Adjustments

The first and second studies employed different statistical methodologies to evaluate the effectiveness of vocal training with selected pop songs in enhancing MWU learning. While both studies aimed to measure MWUs gains, the second study implemented a more refined statistical approach to address the limitations observed in the first study and improve the reliability and validity of its findings.

One of the primary methodological refinements in the second study was addressing statistical assumption violations. The first and second studies encountered significant violations of normality, homogeneity of variances, and homogeneity of regression slopes. To address these issues, the second study implemented a logit transformation to correct for non-normality in the data. Table 42 summarizes the assumption violations encountered in the first study and the corrective measures applied in the second study:

Table 42. *Statistical Assumption Violations and Adjustments*

Statistical assumption	First study	Second study
Normality	Violated at T0 (skewness = 1.68, kurtosis = 2.22)	Addressed using logit transformation
Homogeneity of variances	Violated (Levene's test p = 0.041)	Controlled via between-subjects effects analysis

Statistical assumption	First study	Second study
Homogeneity of regression slopes	Violated (interaction p = 0.0001)	Addressed using MANCOVA

A key methodological enhancement in the second study was the introduction of multivariate statistical techniques to better capture the complexity of MWU learning. Unlike the first study, which did not incorporate multivariate analyses, the second study applied Wilks' lambda, Pillai's trace, Hotelling's trace, Roc's largest root to assess the combined effects of predictor variables across multiple outcome measures. MANCOVA allowed for a more comprehensive analysis of multiple dependent variables while controlling for covariates.

Additionally, the second study improved the precision of effect size calculations by leveraging its larger sample size. While both studies used Cohen's *d* to quantify intervention effects, the second study's effect size estimates were more reliable due to the increased statistical power. Furthermore, the second study incorporated contrast analysis (K matrix) to examine subgroup differences, whereas the first study's subgroup analysis focused only on gender differences. Table 43 below provides an overview of the statistical methods used in each study:

Table 43. *Comparison of Statistical Methods: First Study vs. Second Study*

Statistical method	First study	Second study
Inferential tests	Paired *t*-test	Between-subjects effects analysis
Covariate control	ANCOVA	MANCOVA
Multivariate analysis	None	Multivariate tests (Wilks' lambda, Pillai's trace, Hotelling's trace, Roc's largest root)
Effect size calculation	Cohen's *d*	Cohen's *d* (improved precision due to larger sample)
Subgroup analysis	Gender differences	Contrast analysis (K matrix)

These methodological advancements in the second study were not arbitrary but were driven by the need to enhance statistical accuracy and account for the increased complexity of the research design. The inclusion of a larger sample from 21 to 212 participants, a control group with a no musical-based approach, and a delayed post-test measurement (T2, two weeks after the T1) necessitated the use of more robust statistical techniques. Furthermore, the transition from ANCOVA to MANCOVA allowed for the simultaneous evaluation of multiple dependent variables, improving the validity of the findings.

Overall, the second study's refined methodology resulted in more reliable and unbiased estimates of intervention effects, addressing the limitations of the first study while providing a more comprehensive assessment of the role of music-based approach for MWU learning.

6.1.2 Comparative Findings on Multi-Word Unit Learning: Effectiveness and Retention

The first study demonstrated a statistically significant improvement in MWUs ($\Delta T = 13.69$, $t(20) = 3.91$, $p = 0.006$) with a medium effect size (Cohen's $d \approx 0.5$), confirming that vocal training with selected English pop songs enhanced MWU learning among lower secondary EFL learners. Given that effect sizes above 0.40 are considered pedagogically meaningful (Hattie, 2009, 2012, 2015; Marzano, 1998, 2003; Kraft, 2020), these results provided empirical support for the potential of music-based approach for MWU learning. Building on these findings, the second study addressed methodological limitations of the first by expanding the sample size ($N = 212$) and refining statistical analyses. These enhancements resulted in stronger effect sizes (Cohen's $d = 0.685$ at T1 and 0.787 at T2), further supporting the effectiveness of music-based approach in MWU learning.

Given the first study's medium effect size and established educational research benchmarks, an increase in effect size within the medium-to-large range (Cohen's d = 0.5-0.8) was anticipated in the second study. This expectation was grounded in several methodological refinements designed to strengthen the intervention's impact. Despite its small sample size ($N = 21$) and within-subject design—which typically yields inflated effect sizes due to reduced individual variability—the first study still produced only a moderate effect. In contrast, the second study incorporated improvements in instructional strategies, enhanced exposure conditions, and tighter control of confounding variables, all of which were expected to amplify the intervention's effectiveness. Previous research on music-based vocabulary learning (Legg, 2009; Salcedo, 2010) has similarly reported moderate-to-large effect sizes when interventions are systematically designed. Therefore, given the suboptimal

conditions of the first study, the expectation of an increased effect size ($d \approx 0.7$-0.8) in the second study was both methodologically and empirically justified.

The observation that the effect size at T2 ($d = 0.787$) exceeded that at T1 ($d = 0.685$) indicated that the music-based approach had a lasting impact on MWUs retention. This outcome supported the notion that vocal training with pop songs and well-being state may enhance the acquisition of MWUs, while INMI may contribute to their consolidation over time.

Beyond the learning effects themselves, the increase in effect size also reflects a more rigorous and reliable estimation process. The second study benefited from several methodological enhancements, including a larger sample size, the inclusion of a control group, and more advanced statistical modeling. Although these factors do not inherently increase the magnitude of the effect, they reduce standard error and enhance the validity and precision of the measurement, thus allowing for greater confidence in the robustness of the observed outcomes.

The introduction of a control group in the second study further strengthened its internal validity. In contrast to the first study, which focused solely on within-group gains, the second study directly compared the music-based intervention to a non-music-based approach. This design enabled clearer attribution of MWUs gains to the specific effects of the music-based methodology, rather than to general language exposure or practice effects.

A final factor contributing to the more robust findings in the second study was the refinement of the statistical analysis. While the first study employed ANCOVA, violations of key assumptions—such as homogeneity of variances (Levene's test: $p = 0.041$) and homogeneity of regression slopes (interaction: $p = 0.0001$)—limited the interpretability of results. To address these issues, the second study applied a logit transformation prior to conducting a MANCOVA. These analytic refinements yielded a more rigorous and unbiased estimate of the intervention's effectiveness.

Despite the overall increase in effect size, it is important to note that the effect did not exceed Cohen's $d = 0.8$, remaining within the moderate-to-large range. While this aligns with initial expectations, it suggests that additional factors may have constrained the potential impact of the intervention. One key factor influencing this outcome was the difference in statistical procedures between the first and second study. The first study employed a paired *t*-test to assess pre-post MWU gains within the same participants, inherently controlling for individual differences and yielding a clearer within-subject effect size estimate. In contrast, the second study's between-group comparisons, employing MANCOVA and between-subjects effects analysis, introduced additional variability due to individual learner characteristics, which may have contributed to the slightly lower observed effect size than initially anticipated.

Additionally, sample size and participant heterogeneity played a crucial role. The larger sample in the second study (N = 212) increased statistical power and improved the precision of effect size estimation. However, it also introduced greater participant heterogeneity, including variations in cognitive abilities, prior MWUs knowledge, musical background, and engagement with the intervention. This diversity likely diluted the overall intervention effect. In contrast, the first study (N = 21), which involved a smaller and relatively homogeneous sample, exhibited less variability in responses, potentially leading to an inflated effect size estimate.

A particularly notable finding in the second study was that *prior English MWUs knowledge* (*T0 PK* and *T0 RK*) emerged as the strongest predictor of MWU learning accounting for a substantial proportion of variance across time points. This suggests that learners with higher initial MWU proficiency levels derived greater benefits from the intervention, whereas those with lower MWU proficiency levels exhibited more modest gains. Consequently, this increased variability in learning outcomes and slightly constrained the overall effect size. These findings are consistent with previous research highlighting the critical role of prior knowledge in vocabulary acquisition and learning (Anderson & Freebody, 1983; Hulstijn, 2001; Webb & Nation, 2017).

At the same time, the extent to which the intervention influenced different aspects of MWUs knowledge varied. In the first study, receptive knowledge exhibited a modest increase following the intervention, as evidenced by a statistically significant improvement in mean receptive knowledge scores ($\Delta T = 3.66$, $t(20) = 2.63$, $p = 0.0151$). However, the effect size was small (Cohen's $d = 0.365$), indicating that while the intervention had a measurable effect, its impact on receptive knowledge was relatively limited.

The second study largely confirmed this trend but introduced important nuances. While within-group gains in receptive knowledge were observed in both the test and control groups ($p < 0.00001$), the between-group differences at T1 and T2 did not reach statistical significance. This suggests that although the music-based approach supported receptive knowledge development, it did not result in significantly greater gains than the non-music-based approach. For the test group, the effect size for receptive knowledge was Cohen's $d = 0.685$ at T1 and increased to $d = 0.787$ at T2, indicating not only retention but a slight improvement over time. The control group also demonstrated receptive knowledge gains, though to a lesser extent ($d = 0.602$ at T1 and $d = 0.573$ at T2). These findings suggest that both instructional approaches were effective, but the test group achieved stronger MWUs receptive long-term retention ($d = 0.787$ vs. $d = 0.573$).

In contrast, the second study revealed that receptive knowledge gains were more substantial and more stable over time than productive knowledge gains. Specifically, the test group's effect size for productive knowledge at T2 was $d = 0.641$—moderate and meaningful, yet lower than the corresponding receptive effect size ($d = 0.787$). These results suggested that while both receptive and productive MWUs knowledge improved as a result of the intervention, receptive knowledge benefitted more consistently from the music-based approach in this study.

Although the first study showed a moderate effect size for productive knowledge (Cohen's $d = 0.541$, $p = 0.0142$), the second study provides stronger evidence for the intervention's impact on receptive MWUs knowledge. The observed increase in effect size for receptive knowledge from T1 to T2 suggests sustained retention, while the effect size for productive knowledge remained lower and did not show a comparable upward trend.

These findings align with previous research emphasizing the role of rhythm and melody in supporting lexical recognition and memory consolidation (Thaut et al., 2005; Tegge, 2015). Receptive knowledge, which involves recognizing MWUs in varied and often unfamiliar contexts, can benefit from repeated exposure through song lyrics. In contrast, productive knowledge tasks, which require recall and articulation in a structured sequence, may require more explicit support and rehearsal for long-term gains.

Beyond differences in receptive and productive knowledge, *gender* emerged as a significant predictor in the first study but not in the second. Indeed, in the first study, female participants demonstrated substantially greater improvements in MWU acquisition than their male counterparts ($\Delta T = 23.84$ vs. $\Delta T = 6.28$). A paired t-test with bootstrapping (1,000 samples) confirmed a statistically significant increase in total MWUs scores following the intervention ($\Delta T = 13.69$, 95% CI [7.25, 20.65], $t(20) = 3.91$, $p = 0.006$), supporting the overall effectiveness of the music-based approach. To account for covariates and further evaluate the effect of gender, a mixed factorial ANCOVA was conducted. The analysis revealed a significant interaction between gender and intervention ($F(1, \text{N-2}) = 6.907$, $p = 0.021$, $\eta^2 = 0.347$), indicating a medium-to-large effect size. However, Levene's test for homogeneity of variances was significant ($F(1, \text{N-2}) = 4.44$, $p = 0.041$), suggesting that variance differed between gender groups, potentially introducing heteroscedasticity. Additionally, the homogeneity of regression slopes assumption was violated ($F(1, \text{N-2}) = 23.13$, $p = 0.0001$), implying that pre-intervention MWUs knowledge influenced post-test MWUs scores differently across gender groups. Despite these methodological concerns, the observed intervention effect remained statistically robust, particularly favoring female participants. Given the relatively small sample size ($N = 21$)

and the assumption violations, these results required further validation in a larger study to determine whether the observed gender effect was consistent and generalizable.

However, the second study did not replicate this effect, as the interaction between gender and intervention was not statistically significant across multiple analyses. The between-subjects effects analysis revealed that gender did not significantly influence MWUs gains at any time point (all $p > 0.05$), confirming that the differences observed in the first study did not persist in the larger sample (N = 212). MANCOVA results confirmed that gender was not a significant predictor of MWU gains at either T1 or T2, with all p-values exceeding .05. The associated multivariate statistics—Pillai's trace, Wilks' lambda, Hotelling's trace, and Roy's largest root—likewise yielded non-significant outcomes ($p = .441$), indicating no meaningful overall effect across the dependent variables. Further statistical validation using contrast analyses (K matrix) confirmed that gender-related differences remained statistically non-significant at all three time points (T0, T1, and T2), with p-values of 0.453, 0.355, and 0.127, respectively. The confidence intervals for these contrasts also included zero, reinforcing the conclusion that gender-related variations in MWU learning were likely due to chance rather than systematic differences between groups.

Several methodological and contextual factors may explain the absence of gender differences in the second study. First, the larger sample size (N = 212) increased statistical power and reduced the likelihood of spurious effects. In smaller samples, individual differences in motivation and cognitive styles can disproportionately influence results, potentially inflating the gender effect observed in the first study. With a larger, more representative sample, variability was better accounted for, and potential gender-related learning differences were averaged out. Second, the intervention protocol was refined to ensure more structured MWUs exposure and improved assessment instruments. These adjustments may have reduced the differential advantage previously observed in female learners by creating a more balanced learning environment. Finally, the second study found that *self-perceived listening comprehension* and *self-perceived approach efficacy* were significant predictors of MWU learning. Given that motivation and engagement play critical roles in vocabulary learning outcomes, these factors may have overshadowed any potential gender-based discrepancies. If both male and female learners perceived the intervention as effective and felt confident in their listening abilities, gender disparities in MWU learning outcomes would have been further minimized.

In summary, while the first study suggested a gender-related advantage in MWU learning, the second study, with a larger sample and improved methodological design, found no evidence of such differences. The results from multiple statistical

tests—between-subjects effects analysis, MANCOVA, multivariate tests, and effect size calculations—consistently indicated that gender was not a predictor of MWU learning. Instead, factors such as *self-perceived approach efficacy*, *self-perceived song listening comprehension* exerted a stronger influence on MWU learning outcomes. These findings suggest that gender effects observed in smaller samples may not generalize when methodological controls are enhanced, reinforcing the importance of considering motivational and cognitive factors in future research on music-based vocabulary learning interventions.

6.1.3 Occurrences of Well-Being and Involuntary Musical Imagery

Participants' well-being during the intervention differed across the two studies, revealing notable trends related to the effectiveness of the music-based approach in fostering participant's well-being. In the first study, self-reported well-being ratings indicated a moderate level of emotional comfort, but a considerable proportion of participants expressed discomfort. Specifically, 28.5% of participants reported feeling highly comfortable, 47.6% remained neutral, and 23.8% experienced discomfort. These findings indicate that, while the music-based approach enhanced learner well-being, a notable proportion of students nonetheless experienced discomfort, potentially stemming from novelty effects, performance anxiety, or unfamiliarity with the pedagogical approach.

In the second study, which expanded the sample size and refined the intervention design, well-being levels among the test group showed a substantial improvement. The average well-being score in this group increased, with a higher proportion of participants reporting positive experiences. Specifically, 42.8% of students in the test group rated their well-being as high (≥75 on a 100-point scale), 51.4% expressed neutrality (scores between 50 and 75), and only 5.8% reported discomfort (scores below 50). The trend indicated that improvements to the intervention design and greater familiarity with the music-based approach had helped foster a more positive well-being state among learners in the second study. In the first study, participants may have experienced cognitive overload due to the introduction of 10 MWUs per session, which may have exceeded their processing capacity and led to reported discomfort. Additionally, the 10-minute timeframe allocated for MWUs presentation and related tasks (fill-in-the-gap and writing tasks) may have been insufficient, potentially increasing time pressure and learner anxiety. Moreover, many participants faced difficulties in completing the tasks due to insufficient scaffolding in the task formats, which increased cognitive strain. Additionally, the first study introduced new task formats (fill-in-the-gap and writing tasks) that were unfamiliar to some par-

ticipants. As a result, they had to learn new MWUs while also adjusting to the task formats, which likely increased cognitive load and may have negatively affected their well-being.

To address challenges identified in the first study, the second study introduced several key modifications. The number of MWUs per session was reduced from 10 to 5 to allow for repeated exposure and reduce cognitive load. A pre-intervention familiarization session was added to introduce the task formats in advance, easing initial adjustment. The presentation phase was extended, and scaffolding tools such as structured prompts and "Help Cards" were incorporated to support learners. Together, these adjustments created a more manageable and supportive learning experience, particularly for the test group. The higher well-being scores observed in the second study suggest that reducing cognitive load, offering scaffolding, and improving instructional clarity can enhance learner comfort and emotional engagement—factors that may, over time, strengthen MWU learning outcomes. Another factor contributing to improved well-being outcomes was the larger sample size, which helped balance individual variations. In contrast to the first study, where well-being scores varied widely due to the small cohort, the second study's expanded sample produced a more stable and representative distribution, minimizing the influence of outliers.

A direct comparison between the test and control groups further supported these findings. In the second study, 42.8% of students in the test group reported high levels of well-being, compared to just 25.6% in the control group. Likewise, only 5.8% of test group participants expressed discomfort, versus 16.6% in the control group, indicating that the music-based approach fostered a more emotionally supportive learning experience.

Summing up, three key trends emerge when comparing well-being results across both studies. First, the test group in the second study reported significantly greater emotional comfort than in the first study, reflecting the benefits of intervention refinements. Second, the music-based approach consistently yielded higher well-being scores than the non-music-based approach. Third, discomfort levels declined in the test group of the second study but remained high in the control group and in the first study overall. These trends reinforced the role of music in supporting learner well-being.

Overall, the findings highlighted that music-based interventions enhance not only MWUs acquisition but also learners' well-being. Improvements from the first to the second study suggest that refining instructional design can significantly increase affective benefits. The significantly higher well-being scores in the test group confirm music's potential to reduce stress and foster a more engaging learning environment.

Comparative analysis of INMI across the two studies revealed distinct patterns in its frequency. In the first study, which exclusively examined the test group receiving the music-based approach, reports of INMI were relatively low. Nearly half of the participants (48%) indicated that they did not experience INMI, while 24% reported that they did. An additional 28% provided uncertain responses, such as "probably" or "no clue," suggesting that some participants lacked awareness of INMI, found it difficult to recognize its occurrence, or did not completely understand the question.

The low frequency of reported INMI in this study can likely be attributed to several key factors. First, the limited exposure time may have influenced the low frequency of INMI occurrences. With a two-week intervention, participants had only 56 minutes of vocal training and 80 minutes of engagement with pop songs, providing relatively few opportunities for INMI to develop naturally. The shorter duration of musical exposure may have limited the reinforcement of auditory patterns, reducing the likelihood of spontaneous mental replay of the song's lyrics or segments thereof.

Additionally, cognitive load appears to have played a significant role. Participants were required to focus on a high number of MWUs per session (10), which may have increased cognitive strain and made it more difficult for musical sequences to be unconsciously processed and retained. Moreover, the novelty of both the intervention and the selected pop songs may have affected the results. Since participants were unfamiliar with the music-based approach and the songs themselves, their initial engagement may have been limited, reducing the likelihood of INMI emergence.

The second study, which introduced key refinements to the intervention, demonstrated a substantial increase in INMI occurrences in the test group compared with the control group, reinforcing the impact of the music-based approach. A significant 66.6% of participants in the test group reported experiencing INMI, with scores exceeding 33.33%, while 19.9% expressed uncertainty, indicating partial INMI occurrences. Only 13.5% of participants reported no INMI at all, suggesting that the structured modifications contributed to a more pronounced activation of INMI.

The significant increase in INMI reports in the second study compared to the first highlighted several key factors that likely contributed to this effect. Enhanced familiarity with the approach, played a crucial role, as participants underwent a structured pre-intervention familiarization phase with the music-based approach. This preparatory stage may have increased their familiarity with the approach and deepened their engagement with the approach, making INMI more likely to occur. Additionally, reducing the number of MWUs per session from 10 to 5 may have lowered

cognitive load, freeing up mental resources for processing and retaining the musical sequences. This reduction likely facilitated the emergence of INMI by enabling deeper auditory encoding.

In contrast, within the control group (non-music-based approach), INMI occurrences were considerably lower. Only 36.5% of participants reported experiencing INMI, while 29.2% provided uncertain responses, and 34.3% indicated no INMI at all.

This substantial difference suggested that the absence of an explicit music-based intervention significantly reduced INMI occurrence, reinforcing the hypothesis that active engagement with music, as well as musical training, enhance INMI. The findings further indicate that structured exposure to music, repetition, and reduced cognitive strain are critical factors in facilitating INMI.

A notable finding of this study is that INMI was reported even within the control group, suggesting that repetitive and rhythmic patterns in the non-music-based approach may have unconsciously triggered the phenomenon. While the control group did not engage with music explicitly, the tempo, dynamics, and structured rhythmic patterns present in the spoken recitation of the song lyrics may have activated cognitive processes similar to those induced by vocal training. Murphey (1990b) firstly proposed that even minimal exposure to rhythmic and repetitive structures can prompt INMI, providing a plausible explanation for why some participants in the control group experienced this effect despite the absence of direct music-based intervention. Supporting this idea, Halpern and Bartlett (2011) and Liikkanen (2012a) found that INMI can emerge not only from explicit musical engagement but also from implicit exposure to rhythmic stimuli that share structural similarities with music. This suggests that rhythmic patterns in spoken language, particularly when characterized by repetitive stress patterns and predictable cadence, may act as unconscious triggers for INMI. Similarly, Williamson and Müllensiefen (2012) emphasized that predictability and repetition in auditory input are critical factors in INMI activation. Their research highlights that structured rhythmic repetition, even in speech, can be sufficient to induce INMI, reinforcing the notion that non-music-based auditory experiences can evoke similar cognitive responses as musical stimuli. Further evidence for this phenomenon comes from Fotidzis et al. (2018), who examined rhythmic and metrical predictions in language acquisition. Their findings suggest that aligning internal neural oscillators with external rhythmic stimuli optimizes auditory processing, supporting the idea that structured rhythmic speech—when consistent in tempo and dynamics—may activate similar neural mechanisms as music. Moreover, the Dynamic Attending Theory (DAT) (Bower, 1970) provides a theoretical framework for understanding this occurrence. DAT posits that attention is natu-

rally guided by rhythmic structures, with external rhythms influencing cognitive engagement and memory retrieval. Applying this theory to the present findings, it becomes plausible that the repetitive and rhythmic elements embedded in the non-music-based intervention may have unintentionally facilitated INMI by directing participants' auditory attention toward predictable rhythmic cues, similar to how music operates in cognitive processing. Finally, the slight presence of INMI in the control group may be attributed to participants recognizing the original song through the lyrics and possibly recalling it from prior exposure outside the intervention. In this regard, Floridou et al. (2017) suggest that the familiarity with lyrics alone—without actual music—can contribute to INMI. This supports the idea that recognizing a song's lyrics during the intervention could have triggered INMI in the participant's mind of the control group. Taken together, these findings suggested that INMI was not exclusively dependent on explicit music-based exposure but can also arise from structured rhythmic patterns within non-music-based contexts. This insight is significant, as it expands the understanding of how rhythm, repetition, and auditory predictability—whether in music or speech—can influence involuntary cognitive responses. Future research should further explore the extent to which subtle rhythmic cues in non-music-based settings contribute to INMI activation and whether this phenomenon can be leveraged as a pedagogical tool in language learning environments.

In summary, the findings indicate a substantial increase in INMI in the second study's test group, rising from 24% in the first study to 66.6%. This suggests that refining the intervention structure, particularly through enhanced repetition and structured scaffolding, facilitated deeper memory consolidation and made song lyrics more accessible to involuntary recall. Conversely, the significantly lower INMI occurrence in the second study's control group reinforces the role of music in triggering INMI, as participants with the non-music-based approach experienced fewer occurrences of INMI. Additionally, the second study showed greater consistency in INMI reports, with fewer uncertain responses compared to the first study, likely due to increased familiarity with the music-based approach and improved question formulation.

Overall, these findings confirm that a structured music-based approach, which optimizes cognitive load, significantly increases the likelihood of INMI, whereas the absence of music leads to fewer occurrences. This highlights the importance of refining intervention design to enhance both cognitive processing and emotional engagement in music-based vocabulary learning.

6.1.4 The Predictive Role of Prior Knowledge and Learner Perceptions in Multi-Word Unit Learning

This section examines the predictive role of *prior English MWUs knowledge* and learner perceptions—such as *self-perceived listening comprehension* and *self-perceived approach efficacy*—in shaping MWU learning across both studies.

Findings from both the first and second studies consistently confirmed that *prior English MWUs knowledge* (both receptive and productive) was the strongest predictor of MWU learning outcomes. However, while the first study provided initial insights into its influence, the second study conducted a more comprehensive statistical assessment, offering a clearer understanding of its role in comparison to the intervention itself. In the first study, the small sample size ($N = 21$) limited statistical power, restricting the ability to fully assess the impact of *prior English MWUs knowledge*. Nevertheless, the results indicated a moderate correlation between *prior English MWUs knowledge* and post-test scores (T1), suggesting that learners with higher initial proficiency in English MWUs benefited more from the intervention. Despite these findings, the lack of a control group prevented a direct evaluation of how *prior English MWUs knowledge* compared to other predictors in shaping MWU learning outcomes.

By contrast, the second study, which featured a significantly larger sample (N = 212) and introduced a control group, allowed for a more robust analysis of the predictive strength of *prior English MWUs knowledge*. A between-subjects effects analysis confirmed that *prior English MWUs receptive knowledge* (*T0 RK*) and *prior English MWUs productive knowledge* (*T0 PK*) were the most significant predictors of MWUs gains at all time points (T1 and T2), far exceeding the impact of the intervention itself. Specifically, *T0 RK* remained the strongest predictor across all statistical models, explaining a substantial proportion of variance at T0 (partial $\eta^2 = .752$, $p < .001$), T1 (partial $\eta^2 = .083$, $p < .001$), and T2 (partial $\eta^2 = .051$, $p = .001$). Similarly, *T0 PK* had a significant impact, with effect sizes of partial $\eta^2 = .448$ ($p < .001$ at T0), .095 ($p < .001$ at T2), and .087 ($p < .001$ at T2).

These results indicated that learners who entered the intervention with a stronger prior English MWUs knowledge demonstrated significantly greater MWUs gains, regardless of whether they belonged to the test or control group. Importantly, the second study also confirmed that the strength of this predictor and its effect remained statistically significant at both T1 and T2. This underscores the enduring role of pre-existing MWUs knowledge in determining vocabulary acquisition and retention.

Additionally, the second study enabled a direct comparison of *prior English MWUs knowledge* as a predictor across the test and control groups. The analysis revealed that *T0 RK* and *T0 PK* exerted an equally strong influence in both groups, with no statistically significant differences in their predictive strength. The statistical comparisons further illustrate this pattern: At T0 no significant differences were found between the groups ($F = 0.564$, $p = .453$, partial $\eta^2 = .003$), confirming that participants had comparable initial English MWUs knowledge. At T1 both groups demonstrated significant MWUs improvement, yet the difference between the test and control groups remained non-significant ($F = 0.859$, $p = .355$, partial $\eta^2 = .004$). At T2 the test group exhibited slightly better MWUs retention, but the effect of group assignment remained statistically insignificant ($F = 2.350$, $p = .127$, partial $\eta^2 = .011$).

These findings highlighted that, while the test group showed slightly stronger MWUs retention, the primary factor driving MWU learning was not the intervention itself but rather the learners' prior English MWUs knowledge. In other words, regardless of the instructional approach (music-based vs. non-music-based), learners with higher pre-existing MWUs knowledge exhibited greater long-term MWUs retention.

However, while prior MWUs knowledge played a dominant role, other factors also shaped the effectiveness of the intervention, particularly learners' perceptions of the approach and song listening comprehension.

Although *song listening comprehension* was not assessed in the first study, limiting direct comparisons, *self-perceived approach efficacy* showed a notable shift between the two studies. In the first study, test group responses were largely inconclusive, with many participants expressing uncertainty about the intervention's effectiveness. This ambiguity may have resulted from the lack of a structured familiarization phase and the substantial quantity of MWUs, which may have prevented learners from fully recognizing approach's benefits. By contrast, in the second study, a significantly higher proportion of participants reported perceiving greater learning gains through the music-based approach compared to the non-music-based approach (57.1%), while fewer participants remained uncertain or perceived no improvement. This shift suggests that refinements in the intervention—such as reduced cognitive load and structured scaffolding-enhanced participants' ability to assess and benefit from the music-based approach.

A comparison between the test and control groups in the second study further underscored the role of music-based approach in shaping perceived learning effectiveness. While some improvement was reported in both groups, responses in the control group were more evenly distributed, with a higher proportion of participants

expressing uncertainty. This indicates that music-based approach played a crucial role in strengthening perceptions of the intervention's efficacy. These results aligned with prior research on self-perception in MWUs acquisition, which highlights the strong link between learners' beliefs about their abilities and their actual learning success (Bandura, 1997; Dörnyei, 2005; Graham, 2006; Oxford, 2016; Pajares, 1996; Zimmerman, 2000).

In addition to *self-perceived approach efficacy*, participants' attitudes toward the benefits of music-based learning and their willingness to continue using the approach evolved between the two studies. In the first study, p*erceived music benefits pre-intervention* data revealed considerable ambiguity among participants: 33.3% (7 pupils) selected "no clue," and 23.8% (5 pupils) selected "no," reflecting a lack of awareness or uncertainty regarding music's benefits for learning. However, 23.8% (5 pupils) already perceived potential benefits ("most likely"), indicating that some pupils held positive preconceptions prior to the intervention. Post-intervention responses demonstrated a shift toward more favorable attitudes. A notably higher proportion of pupils (47.6%, 10 pupils) endorsed the music-based approach as "most likely" beneficial, while the number of "no clue" responses dropped to zero. This trend suggests that structured exposure to the approach helped clarify its perceived benefits. Pupils who initially reported uncertainty (e.g., "no clue" or "probably") showed the greatest change, with several moving to more affirmative categories. Overall, the proportion of positive or neutral perceptions rose from 61.9% to 71.4% post-intervention—an increase of 9.5%. Nevertheless, these findings should be interpreted cautiously due to the small sample size. The results informed refinements in questionnaire design for the second study, allowing for more reliable assessment of students' self-perceptions music benefits. In the second study, perceived music benefits were evaluated more rigorously using a validated scale administered at both pre- and post-intervention timepoints across a large sample (N = 212). Descriptive statistics indicated a substantial increase in positive perception: the mean score rose from –0.205 (SD = 6.068) pre-intervention to –4.913 (SD = 5.747) post-intervention. Although the negative direction of the scale should be clarified contextually (e.g., higher absolute values reflecting stronger endorsement), the shift suggests improved self-perceptions of music's benefits for learning.

A similar pattern was observed in participants' *willingness to adopt the music-based approach*. In the first study, responses were mostly ambiguous, suggesting hesitancy in integrating the approach into their future learning routines. In contrast, the second study showed a substantial increase in willingness to implement the approach, with many test group participants reporting high endorsement levels (66.66%-100%). Meanwhile, responses in the control group were more varied, with

a significant proportion rating their willingness at 33.33% or lower, indicating that the non-music-based intervention did not generate the same level of endorsement.

Although *self-perceived music benefits* and *willingness to continue using the approach* did not significantly impact immediate MWU learning, they may serve as meaningful predictors of sustained engagement and autonomous learning in longer-term interventions. These findings suggest that optimizing intervention design and providing structured support can strengthen learners' self-perceived approach efficacy, potentially enhancing both cognitive and affective outcomes over an extended period.

6.1.5 Summary and Implications

The comparative analysis of the first and second studies confirms that methodological refinements, increased sample size, and improved statistical controls significantly enhanced the validity and reliability of the findings. While both studies demonstrated the effectiveness of vocal training with pop songs for MWU learning, the second study showed stronger MWUs gains (Cohen's d = 0.685 at T1, 0.787 at T2) and better long-term retention. These outcomes were likely driven by refined instructional strategies, while the larger and more representative sample—together with the inclusion of a control group using a non-music-based approach—enhanced the reliability and generalizability of the findings.

The second study identified key predictors of MWU learning, confirming that *prior English MWUs knowledge*, *self-perceived approach efficacy*, and *self-perceived listening comprehension* played a stronger role than *gender*, which was found to be a significant predictor in the first study but not in the second. These findings reinforce that prior English MWUs knowledge, motivation, and confidence in the learning approach are critical determinants of MWU learning success.

The second study also confirmed the positive effects of music-based interventions on well-being and INMI. Participants in the test group reported significantly higher well-being levels and more frequent occurrences of INMI, suggesting that music-based approach fosters both cognitive and emotional engagement. Additionally, participants in the test group exhibited a marked increase in their perception of music's benefits and willingness to integrate the approach into their future learning practices, reinforcing the long-term potential of music-based vocabulary instruction.

Overall, the results underscore the necessity of optimizing cognitive load, integrating motivational factors, and ensuring methodological rigor when implementing music-based vocabulary interventions. These insights contribute to refining mu-

sic-based vocabulary instruction and provide empirical support for its broader application in educational contexts.

6.2 Overview of Key Contributions: Advancements in Research, Theory, and Pedagogy

This section outlines the principal contributions of the present research, which span three interrelated domains: theoretical advancement, empirical validation, and pedagogical innovation. By clearly delineating these dimensions, the research provides a comprehensive account of how music-based approach can enrich current understandings of MWU learning, enhance instructional practice, and expand methodological approaches within early EFL contexts.

From a theoretical perspective, this study made significant contributions to models of MWU learning situated at the intersection of music, memory, and vocabulary acquisition. It refined existing frameworks and extended several core hypotheses. First, it offered empirical support for music-language interaction models by demonstrating the value of a multimodal approach in facilitating the learning of MWUs. Through structured vocal training and repeated exposure to musical input, the findings underscore the role of integrated musical and linguistic stimuli in supporting vocabulary development, with particular emphasis on the synergistic processing of melody, rhythm, and language. Second, the study empirically validates and theoretically extends Murphey's (1990b) hypothesis that music-induced INMI—defined by him as "song stuck in my head phenomenon"—facilitates subconscious vocabulary learning. It provided robust evidence that INMI is not only a measurable phenomenon but also significantly correlated with MWU gains, thereby positioning INMI as a plausible mechanism for implicit lexical consolidation. Third, the study identified individual-level cognitive and affective predictors of INMI, including *prior MWUs knowledge*, learner *well-being*, and *self-perceived song listening comprehension*, and *self-perceived approach efficacy*. These insights contributed to advancing models of subconscious language processing by integrating learner-specific variables into explanations of how musical memory supports vocabulary retention. Lastly, the study foregrounds the theoretical relevance of well-being in lexical development. While enhanced well-being (Cohen's d = 1.287 at T1) did not consistently predict long-term MWU retention, the observed patterns highlight a complex and non-linear relationship between emotional state and lexical outcomes. This finding calls for more nuanced theoretical models that account for both immediate and sustained affective influences in second language acquisition.

Empirically, the study provided compelling evidence for the cognitive, affective, and implicit learning benefits of a music-based approach to MWU learning in early EFL contexts. Statistically significant learning gains were recorded in the test group, with effect sizes of Cohen's $d = 0.787$ for receptive knowledge and $d = 0.641$ for productive knowledge at delayed post-test (T2), exceeding established instructional benchmarks (Hattie, 2009; Marzano, 1998, 2003). Notably, delayed retention testing revealed that the test group not only maintained but slightly improved MWU knowledge over time—particularly for receptive knowledge—while the control group exhibited a decline in both receptive and productive MWU knowledge. Although between-group differences did not reach statistical significance ($p > 0.05$), within-group patterns strongly suggest that the intervention supports long-term MWUs retention. The study also establishes empirical benchmarks for music-based instruction that can inform future meta-analyses and facilitate cross-study comparability. Additionally, several key predictors of MWU learning were identified: *Prior MWUs knowledge* emerged as the strongest predictor (partial $\eta^2 = 0.752$ for receptive; $\eta^2 = 0.448$ for productive), followed by *self-perceived listening comprehension* ($F = 17.121$, $p < 0.001$ at T1; $F = 9.696$, $p = 0.002$ at T2), and *perceived approach efficacy* ($F = 9.596$, $p = 0.002$). Affective and motivational variables—such as *well-being* ($r = 0.530, p < 0.001$), *willingness to adopt the approach* ($r = 0.465, p < 0.001$), and *song preference* ($r = 0.428, p < 0.001$)—were likewise positively associated with MWU learning.

The study also contributed original empirical findings concerning the occurrence and pedagogical role of INMI. Quantitative analysis revealed that INMI was significantly more prevalent in the test group than in the control group (Cohen's $d = 0.576$ at T1; $d = 0.432$ at T2), indicating that vocal training with songs effectively triggers INMI. Notably, INMI persisted beyond the intervention period. Learners who reported experiencing INMI also demonstrated substantially larger MWUs gains (Cohen's $d = 0.926$ at T1; $d = 1.532$ at T2), reinforcing the hypothesis that INMI facilitates vocabulary learning through subconscious, repeated mental rehearsal. Predictors of INMI included *prior MWUs knowledge* ($\eta^2 = 0.083$–0.095), *well-being*, *perceived efficacy of the approach* ($r = 0.448$), *song preference*, and *willingness to adopt the approach*. These findings emphasized the interconnectedness of cognitive, emotional, and motivational factors in activating and sustaining INMI.

From a pedagogical standpoint, the study addresses key practical challenges associated with vocabulary instruction for young EFL learners. It delivers replicable, curriculum-aligned, and research-informed instructional materials, thereby enhancing the feasibility of music-based approaches in classroom settings. A theoretically grounded and empirically validated corpus of 56 authentic English pop songs was

developed based on rigorous linguistic, curricular, and musical criteria. Songs were systematically selected using WordSmith Tools and a MATLAB-based classification model, which assessed lexical complexity, speech rate, repetition, and musical structure. This process bridged the gap between corpus linguistics and classroom applicability.

The instructional materials were integrated within a pedagogical framework rooted in Nation's (2008) Four Strands—meaning-focused input/output, language-focused learning, and fluency development—as well as his three vocabulary learning processes: noticing, retrieval, and creative use (Nation, 2001). MWUs were thus introduced and reinforced through multimodal learning opportunities across listening, speaking, reading, and writing. A custom-designed MWUs assessment tool (MWUs test) was also developed, featuring both cloze and productive writing tasks aligned with Nation's (2013a) multidimensional model. The scoring rubric evaluated MWU knowledge across form, meaning, and use—including morphological accuracy, collocational appropriateness, grammatical function, and referential clarity. The test was aligned with both CEFR descriptors and legal assessment standards in North Rhine-Westphalia (Germany).

To support implementation and replication, the study provided two fully developed, open-access lesson series (Boxes 3 and 7), available both in the Appendix K and online (https://osf.io/n9jdf/overview?view_only=87c40431df2342179b5a78370a927b51). These include lesson plans for eight sessions per box, differentiated worksheets, gap-fill tasks, writing prompts, help cards for lower-performing students, fast finisher materials, music videos with lyrics (test group), audio story recordings with transcripts (control group), MWUs presentation cards, and assessment rubrics. By responding directly to previously documented teacher concerns regarding licensing, sourcing, and preparation time (Engh, 2013; Werner & Tegge, 2021), this study lowered practical barriers to adoption while ensuring high pedagogical integrity.

In sum, the present study offered a triangulated contribution to the field of music-based vocabulary instruction. It advances theoretical models of music-mediated language learning, provides empirical benchmarks that support the efficacy of music-based approaches in enhancing MWU learning, and delivers scalable, teacher-friendly resources aligned with curricular and assessment standards. Together, these contributions establish a replicable and theoretically robust instructional model for integrating music and language learning in early EFL education.

6.3 Limitations of the Research

Several limitations of this study warrant careful consideration, particularly concerning the duration of the intervention, cognitive load, individual variability, material selection, prior exposure to the materials, and the design and structure of the pre- and post-intervention questionnaires. These constraints may have influenced the findings and should be addressed in future research to strengthen the validity and generalizability of music-based vocabulary instruction.

The primary limitation of this research was the short duration of the intervention, which spanned two weeks with a total of 360 minutes—56 minutes dedicated to vocal training and 24 minutes for listening to the songs in the warm-up phase. While this timeframe was carefully chosen based on educational and neuroscientific evidence, as well as findings from the first study and practical constraints, it may have restricted the extent of MWU learning. The decision to implement a two-week intervention, comprising eight English classes, was guided by previous research indicating that shorter interventions, such as the four-day exposure in Medina's (1993) study, failed to produce significant vocabulary gains. In contrast, studies employing a two-week duration (Good et al., 2015; Kuśnierek, 2016; Alipour et al., 2012) demonstrated positive learning outcomes, reinforcing the feasibility of this timeframe. Additionally, findings from the first study further supported this decision, with results indicating a statistically significant improvement in MWU learning ($\Delta T = 13.69$, Cohen's $d \approx 0.5$). This moderate effect size aligns with established benchmarks in educational research, where values above 0.4 are considered pedagogically relevant (Hattie, 2009, 2012, 2015; Marzano, 1998, 2003; Kraft, 2020). Furthermore, neuroscientific research suggests that two weeks of musical training can induce neural changes. Lappe et al. (2008) found that musical training over this duration led to modifications in event-related potentials (ERPs), supporting the hypothesis that structured musical exposure over two weeks could facilitate MWU learning.

In addition to theoretical and empirical considerations, practical constraints played a decisive role in determining the intervention's length. Extending the duration beyond two weeks would have posed significant logistical challenges, given the need to align with school curricula, maintain instructional coherence, and minimize disruptions to academic schedules. The intervention was designed to fit within these parameters while maximizing pedagogical impact.

While the two-week intervention effectively facilitated MWU learning, extending its duration could have resulted in more robust and durable outcomes, including enhanced MWU retention and consolidation, longer-lasting well-being im-

provements, and more pronounced INMI effects that may further reinforce implicit learning.

This hypothesis was supported by several key predictors identified in the study, including statistical trends, effect size progression over time, group-based retention differences, and insights from previous research. First, the continuous increase in effect size highlights the gradual nature of MWUs consolidation. For receptive knowledge, the effect size for the test group grew from Cohen's $d = 0.685$ at T1 to 0.787 at T2, while productive knowledge, though exhibiting a smaller increase, also improved (Cohen's $d = 0.594$ at T1 to 0.641 at T2). These findings suggest that MWU learning does not plateau within two weeks but continues to develop.

Furthermore, retention patterns indicated the potential benefits of prolonged training. The test group demonstrated stable and slightly increasing MWUs retention at T2, while the control group experienced a decline in mean scores (from -0.1498 to -0.2168 for receptive knowledge). Similarly, productive knowledge in the control group declined from T1 to T2, whereas the test group exhibited sustained retention. This stability and slight improvement in test group scores at T2 indicate that extending the intervention might have reinforced MWUs consolidation and long-term retention.

The results of the research question 1 addressing MWU learning gains further supports this interpretation. The test group exhibited significant MWUs improvements at both T1 (partial $\eta^2 = 0.279$) and T2 (partial $\eta^2 = 0.210$), with consistently high effect sizes (Cohen's $d = 0.926$ at T1 and 1.532 at T2). Moreover, INMI occurrences were significantly higher in the test group than in the control group at both T1 and T2. Despite the intervention concluding at T1, INMI persisted at T2, suggesting that prolonged exposure could maintain or even amplify its effects. Had the intervention continued beyond T1, it is likely that INMI occurrences would have further increased at T2, potentially enhancing long-term MWUs retention.

Findings from previous studies corroborate the effectiveness of extended interventions in vocabulary learning. Research consistently indicates that longer interventions enhance recall more effectively than shorter ones (Hahn, 1972; Bygrave, 1985; Heidari & Araghi, 2015; Javadi-Safa, 2018; Köksal et al., 2013). Additionally, repeated exposure over an extended period is associated with higher vocabulary gains (Pavia et al., 2019; Webb & Chang, 2012a, 2015a; Webb, 2007a), with significant improvements only emerging after prolonged engagement (Abidin et al., 2011; Bygrave, 1995). The principle of spaced repetition further supports the need for extended intervention periods, as multiple exposures over time optimize MWUs retention (Webb & Chang, 2012a, 2015a; Webb & Nation, 2017).

Beyond MWU learning, extending the intervention duration would likely have increased familiarity with song structures, which has been shown to enhance vocabulary acquisition by segmenting words into meaningful units (Coyle & Gómez Gracia, 2014; Deutsch, 1999; Purnell-Webb & Speelman, 2008; Wallace, 1994). Familiarity with musical structures facilitates chunking, a cognitive process that supports linguistic memory and retrieval, allowing for more effective MWU learning.

In addition to cognitive and linguistic benefits, a longer intervention would have fostered sustained emotional engagement and well-being, further enhancing MWU learning. Research indicates that reducing anxiety strengthens memory and enhances cognitive processing (Calvert & Tart, 1993; Dolean, 2016; Dolean & Dolean, 2014; Eschrich et al., 2008; Krashen, 1985a; Lozanov, 1978; Luckner, 2007; Overmann, 2005). In the current study, well-being increased significantly at T1 (Cohen's $d = 1.287$), suggesting a strong immediate effect of the intervention. However, as exposure to the music-based approach ceased, well-being declined at T2 (Cohen's $d = 0.384$), indicating that sustained engagement is necessary to maintain these benefits.

Moreover, extended exposure to the intervention is likely to enhance MWUs consolidation by repeated INMI occurrences. Prolonging the intervention would improve the likelihood of involuntary recall episodes, thereby strengthening memory consolidation of target MWUs (McQuillan & Rodrigo, 1995; Murphey, 1990b; Salcedo, 2002, 2010; Wilcox, 1996). Notably, the persistence of INMI at T2—despite the intervention concluding at T1—suggests that longer exposure to musical stimuli could have further amplified this implicit retrieval mechanism.

In summary, while the two-week intervention effectively demonstrated the efficacy of a music-based approach, the findings suggest that a longer duration might have yielded even greater benefits. An extended intervention could have supported more substantial MWU learning outcomes, sustained improvements in well-being, and prolonged INMI occurrences. Nevertheless, the two-week timeframe was purposefully chosen to balance practical feasibility, curricular constraints, and research-informed design.

Beyond the duration of the intervention, another potential limitation lies in the cognitive demands imposed by the quantity of MWUs introduced. While singing has been associated with enhanced encoding through dual-hemisphere processing and the slower pace of sung language is believed to support vocabulary retention, the introduction of 40 MWUs within two weeks may have exceeded learners' cognitive capacity, likely contributing to a cramming effect, resulting in processing strain rather than effective learning. The absence of sufficient repetition cycles in this study may partially explain why statistically significant differences between test and con-

trol groups were not observed. Future interventions should integrate distributed practice models to promote gradual, reinforced learning, rather than relying on short-term immersion.

Moreover, this research underscores the risk of cognitive overload in music-based approaches, as learners have to simultaneously process lyrics and vocal execution. This dual-task demand has been shown to increase processing strain and may have hindered MWU learning rather than facilitating it (Calvert & Billingsley, 1998; Racette & Peretz, 2007).

Furthermore, the unfamiliarity of participants with a music-based approach may have further exacerbated this strain, as they had to adapt to a novel instructional approach distinct from reading- or recitation-based approaches. To mitigate cognitive overload, future interventions should incorporate preparatory sessions that gradually acclimate learners to the music-based approach, fostering a smoother transition and enhancing instructional efficacy.

Another limitation concerns the lexical and syntactic complexity of the selected pop songs, which may have posed challenges for lower-proficiency learners like the participants of the intervention. Research suggests that adequate lexical coverage (95-98%) is necessary for text comprehension (Tegge, 2017), a threshold difficult to achieve with pop songs, as they generally contain figurative language, irregular stress patterns, and complex syntax (Richards, 1969; Webb & Nation, 2017).

Moreover, selecting older and not up-to-date pop songs risks lower learner engagement, highlighting the challenge of balancing linguistic accessibility with learner's interest. Future interventions should consider lexically simplified song adaptations or use carefully curated playlists to ensure that musical material aligns with learners' proficiency levels and interest.

Additionally, research suggests that unfamiliar melodies can act as cognitive distractors until they become familiar (Wallace, 1994; Purnell-Webb & Speelman, 2008). The short duration of this study may have prevented learners from developing familiarity with the selected melodic lines, potentially reducing intervention effectiveness.

Moreover, observations from teachers in control groups suggested that some pupils had prior exposure to certain songs through home listening and social media. This familiarity could have positively influenced MWU learning in the control group, as prior exposure facilitates lexical recall and ease of processing (Tegge, 2017). However, this also introduces a potential confound, as learners with pre-existing exposure to the songs may demonstrate greater MWUs gains independent of the intervention. Future research should carefully assess the extent of prior exposure to the music materials and account for its effects on MWU learning outcomes.

From a methodological point of view, although the study employed MANCOVA models to control for covariates, unmeasured variables such as learner motivation and engagement may have influenced the results. This necessity is evident from the declining predictive power of the models over time (T1 → T2) in all the analyses.

Additionally, significant variability within participant groups was observed, reflected in high standard deviations across T1 and T2. Key individual differences, such as *prior English MWUs knowledge*, *musical training*, and *self-perceived approach efficacy* played a determinant role in shaping learning outcomes. The decline in adjusted *R*-squared values across assessment points indicates that unmeasured variables contributed to variance, suggesting the need for further exploration of moderating variables. Future studies should adopt larger sample sizes and conduct hierarchical regression analyses to better understand learner-specific variables influencing vocabulary learning.

Furthermore, reliance on one post-intervention measures at T1 and T2 for well-being and INMI presents a potential measurement constraint, as self-reports—especially among younger participants—are prone to bias and may not accurately capture longitudinal changes. Implementing repeated measures at multiple time points would improve measurement reliability and offer a more comprehensive picture of the intervention's impact regarding well-being and INMI.

A further limitation concerns the structure and design of the pre-intervention questionnaire. Despite its overall reliability, minor issues were noted during administration. In question 3, the term "mother language" may have been misinterpreted literally as "the language spoken by one's mother," rather than "first language." Similarly, Question 4 also posed potential challenges. It reads: "Wie viele Sprachen kannst du außerhalb deiner Muttersprache gut genug sprechen, um dich mit deiner Familie, Freunden und Bekannten zu unterhalten? Welche Sprache(n)?" ("Outside your mother tongue, how many languages can you speak well enough to communicate with family, friends, and acquaintances? Which language(s)?"). This question combines two requests—one quantitative and one qualitative—within a single sentence and uses complex phrasing that may have been cognitively demanding for 12-year-old pupils. Some students may have struggled to determine whether both components required full answers or may have answered only partially, reducing the validity of the responses.

Questions 5 through 13, which focus on the variable of English exposure, were grouped into three thematic subsections, each using a different response scale. The first subsection (questions 5-8) employed a five-point Likert scale ranging from 0 ("never") to 4 ("daily"), asking how frequently pupils interacted with English-speak-

ing people, read English texts, watched English- language media, or used English online (Baker, 2011; Fishman, 1972; Gudykunst, 2005; Oksaar, 2018; Oxford, 1990; Thorne & Black, 2011; Warschauer & Grimes, 2007). Questions 9 and 10 asked whether students had visited an English-speaking country during the 2023 school summer holidays (from June 22 to August 4, 2023 since the intervention took place in the school year 2023/2024) and requested the name of the country. The second question served as a verification tool, allowing the researcher to correct inaccurate answers—such as incorrectly listing non-English-speaking countries like the Netherlands—which could compromise data accuracy (Baker & Prys Jones, 1998; Byram, 1997; Krashen, 1981).

The next subsection (questions 11 and 12) focused on the frequency and duration of visits to English-speaking countries. However, the wording of these questions may have resulted in problematic or exaggerated answers. For instance, a student might interpret "how many times" literally and respond "42" if they considered each individual day of a six-week trip as a separate visit. In turn, the question on length of stay required pupils to report their answer in weeks, which could lead to loss of precision for shorter visits of only a few days. For consistency and reliability, it is recommended that future research use a Likert scale format for both of these questions. For statistical analysis, responses were standardized by converting the duration to a 1-6 scale (with one week as the minimum and six weeks as the maximum, corresponding to the full summer holiday). The final question in this section (question 13) assessed the frequency with which pupils spoke English during their stay abroad. It used a Likert scale from 1 ("rarely") to 5 ("several times a day") to capture the degree of English use during these trips.

To create a composite score for English exposure, the questionnaire responses across all three subsections were normalized. The total points a student scored in each subsection were divided by the maximum possible score and then multiplied by 100. The three resulting values were then averaged to produce a final exposure score ranging from 0 to 100, providing a robust and interpretable metric of exposure to English.

The dimension of music exposure, particularly to English pop songs, was addressed in question 15, which used a Likert scale from 0 ("never") to 4 ("more than once a day") to assess the frequency of listening to English-language music. Additional items also contributed to this variable. Question 14 explored general music interest and listening behavior not limited to pop music. Question 16 gauged students' comprehension of English lyrics, while question 17 asked about their preference for the pop genre and familiarity with internationally known artists (DeNora, 2000; Summer, 2010).

One specific challenge arose in question 23, which read: "Ich habe ein nicht beeinträchtigtes Gehör" ("I have unimpaired hearing"). This formulation confused several students during the survey administration, and teachers had to clarify its meaning in multiple cases. To improve comprehension in future studies, the phrasing should be revised or accompanied by a brief explanation.

The final set of questions (questions 19 to 22) assessed the variable of musical training. Questions 19, 20, and 21 were scaled from 0 ("never") to 3 ("regularly"). Question 19 inquired whether students were currently enrolled in music lessons—either privately or at a music school- and for how many years they had participated (Amunts et al., 1997; Bangert et al., 2006; Besson & Faita, 1995; Gaser & Schlaug, 2003; Schlaug et al., 1995a; Schön et al., 2004). Question 20 asked how frequently students attended musical events such as concerts, operas, or ballet performances (Bangert et al., 2006; Gaser & Schlaug, 2003). Question 21 collected data on which instruments students played and how often, offering frequency options from "1-2 times per year" to "daily" (Jentschke, 2018; Magne et al., 2006). Question 22 posed a related but temporally retrospective question: "How old were you when you had your first music lesson outside of school?" While potentially informative, this question was excluded from the composite score calculation, as it does not account for continued or current training. A pupil who had brief lessons at age six would receive the same score as one with ongoing weekly instruction, thereby reducing the precision of the metric. In contrast, question 19 provided a more consistent and direct measure of current training intensity and duration (Altenmüller & Schlaug, 2015; Chan et al., 1998; Ho et al., 2003; Moreno et al., 2001; Sommer, 2016).

In sum, while the pre-intervention questionnaire was a reliable and comprehensive tool aligned with best practices in educational survey design, minor issues related to question formulation, scale design, and data interpretation emerged. These were addressed during data cleaning and should inform revisions for future research. Nevertheless, the overall structure of the instrument provided valid, reliable, and nuanced insights into the key variables shaping students' linguistic and musical learning profiles.

Finally, the post-intervention questionnaire presented several design-based limitations. One primary issue concerns the sequencing of items related to students' psychophysical well-being and relaxed wakefulness—key constructs addressed in RQ2. Questions 1, 2, 3, and 7 all explore this domain using a four-point Likert scale ranging from 0 ("never") to 3 ("always"). Although each item targets a slightly different aspect of the learner's emotional and cognitive state, they all relate to the overarching theme of well-being during the intervention. However, these questions are currently distributed across different parts of the questionnaire. Grouping them se-

quentially in future iterations would improve internal coherence, reduce the cognitive load for respondents, and facilitate more streamlined data analysis.

A second limitation pertains to the assessment of pupils' willingness to adopt the approach—an important construct for understanding pedagogical acceptance and motivational engagement. This is addressed in questions 9, 10, and 11. Question 9 ("I would like to learn new English words and phrases through pop songs in the future") and Question 11 ("I would like to have more English lessons using pop songs") both refer to the medium of pop songs in general but omit reference to the act of singing, which was central to the test group's experience. In contrast, question 10 specifically mentions singing: "I would like to learn new English words and phrases by singing pop songs in the future." This specificity is essential, as pop songs can serve a variety of instructional purposes—such as passive listening, reading lyrics, or watching videos—that do not necessarily involve singing. Without explicitly referencing singing, questions 9 and 11 risk conflating general exposure with the targeted intervention technique, thereby weakening construct validity. For future applications, aligning the wording across these items to consistently reference singing would yield more accurate insights into student willingness to adopt the specific instructional approach under study.

A further limitation involves question 6, which—alongside question 8—was designed to evaluate students' perceived learning gains through the intervention. Unlike question 8, which used a standard Likert format, question 6 omits a baseline "zero" category indicating an absence of learning. While the lowest response option ("I learned significantly fewer words and phrases than usual") was intended to capture minimal perceived gains, the lack of a "none" or "not at all" option restricts the ability to identify students who felt they learned nothing at all during the intervention. This omission may have led to an underreporting of non-learning experiences. As suggested by Dörnyei and Taguchi (2010), comprehensive response scales must allow respondents to express both positive and null effects to avoid skewed results. Including a "0" response category in future versions would allow for a more nuanced and complete understanding of participants' perceptions.

Finally, question 12 posed potential challenges related to conceptual clarity and item interpretation. The item—"I believe that music lessons outside of school, such as private tutoring or music schools, can positively impact other areas of my life, such as learning, concentration, or relaxation"—was designed to capture post-intervention attitudes toward musical training, complementing the pre-intervention equivalent. However, inconsistencies in the data suggest possible misinterpretation. Some pupils who strongly affirmed the value of pop songs for vocabulary acquisition in earlier questions selected "unlikely" or "neutral" in response to this item. This

contradiction indicates that learners may not equate classroom-based singing of pop songs with the concept of formal music education, such as instrumental training or structured lessons at music schools (Bangert & Altenmüller, 2003; Benz et al., 2016; Bhide et al., 2013; Chan et al., 1998; Dittinger et al., 2016; Dörnyei & Ushioda, 2011; François et al., 2013; Hallam, 2010; Lightbown & Spada, 2013; Macmillan, 2013; Nation, 2001; Peretz & Zatorre, 2005; Schön et al., 2004, 2008; Schön & François, 2011; Summer, 2010; Thompson et al., 2004). To address this ambiguity, future studies should consider rephrasing the item to explicitly distinguish between formal musical training and classroom-based singing activities to ensure clearer alignment with respondents' experiential understanding.

In summary, while the study demonstrated robust methodological design and generated compelling results regarding the impact of a music-based intervention on MWU learning, several limitations emerged across the implementation, cognitive, material, and measurement domains. These include the brevity of the intervention, cognitive load, the complexity of materials, prior exposure to music content, and specific challenges in questionnaire construction. Addressing these limitations in future research will enhance the reliability, generalizability, and pedagogical applicability of music-based language learning interventions.

6.4 Future Research

Building on the limitations identified in the previous section, future research should refine and expand upon the findings to enhance the effectiveness of music-based MWU learning approaches. Key areas for improvement include extending the duration of interventions, optimizing instructional design to manage cognitive load, incorporating a broader range of learner-specific predictors, refining material selection, and employing more comprehensive assessment methodologies.

The two-week intervention in the current study was likely insufficient to achieve enduring improvements and sustained gains in well-being, INMI, and, ultimately, MWU learning when comparing the test and control groups. Research suggests that meaningful retention effects only emerge after sustained musical training, with durations ranging from 20 intervention days (Moreno et al., 2011) to 30 weeks (Bygrave, 1995). Future interventions should extend beyond two weeks (8 English classes: 360 minutes of 56 minutes dedicated to vocal training and 24 minutes for listening to the songs in the warm-up phase) to allow for deeper processing, integrating spaced repetition techniques to enhance MWU learning efficiency (Harry et al., 1993; Horst & Meara, 1999; Penno et al., 2002; Webb & Chang, 2012a, 2015a; Webb & Nation, 2017).

Moreover, the simultaneous processing of melody, lyrics, and vocal training could have imposed cognitive demands, potentially hindering MWU learning (Calvert & Billingsley, 1998; Racette & Peretz, 2007), particularly because the music-based approach and songs were unfamiliar to learners. To mitigate this, future research should incorporate preparatory training to help learners acclimate to the approach and consider the role of familiarity with the music materials. Indeed, familiarity with songs played a crucial role in reducing cognitive strain and may enhance MWU learning, INMI, and well-being (Coyle & Gómez Gracia, 2014; Purnell-Webb & Speelman, 2008; Wallace, 1994; Williamson & Müllensiefen, 2012). Future studies should assess learners' familiarity with music materials beforehand and empirically compare the effects of familiar and unfamiliar songs on MWU learning, INMI, and well-being.

Selecting appropriate music materials is essential for balancing linguistic accessibility and learner engagement. Pop songs often contain complex lexical and syntactic structures that may challenge lower-proficiency learners, as effective comprehension requires a lexical coverage of 95-98% (Tegge, 2017). To mitigate cognitive load and optimize learning outcomes, future research should explore a wider range of musical genres with simpler lyrical structures, such as folk, country, reggae, gospel, and soft rock. Additionally, interventions could incorporate lexically simplified adaptations or carefully curated playlists that align with learners' proficiency levels and learner's interest at the same time. Providing students with the opportunity to select songs from a predefined playlist or submit their preferences for teacher approval could further enhance pedagogical relevance and emotional engagement, fostering a more personalized and motivating learning experience (Schellenberg & Weiss, 2012; Leggieri et al., 2019; Livesey et al., 2012).

Furthermore, the integration of kinesthetic activation alongside musical training could further support MWU learning. Research suggests that coupling music with physical movements positively influences vocabulary retention (Hahn, 1972). Future studies could explore the potential of multimodal approaches incorporating movement, gesture, and rhythm-based reinforcement strategies.

From a methodological perspective, statistical analyses of this study highlight the need to incorporate additional predictors to enhance the explanatory power of future models. Variables such as *self-perceived approach efficacy* and *self-perceived song comprehension* emerged as significant predictors, suggesting their potential for improving model accuracy. Despite modest explanatory power at T1, a substantial proportion of variance remains unexplained, reinforcing the necessity of refining models to include additional factors that could account for observed outcomes at subsequent stages.

Moreover, to overcome the limitations of self-reported measures, future research should incorporate physiological assessments such as heart rate variability or cortisol levels alongside self-reports to provide a more comprehensive understanding of the intervention's impact regarding well-being. This approach could mitigate the biases inherent in self-reported measures, particularly among younger participants.

Longitudinal neuroimaging studies could provide valuable insights into INMI and the neural mechanisms underlying music-based MWUs approaches. Techniques such as fMRI could be used to examine structural and functional brain changes resulting from musical training (Bangert & Altenmüller, 2003; Schlaug et al., 2005) and to analyze how different brain regions are activated through INMI. Particularly, investigating changes in auditory and motor regions would deepen our understanding of the interaction between music and language processing.

Additionally, comparative studies contrasting musicians with non-musicians could shed light on the musician advantage and its role in vocabulary and language learning. Examining how musical ability influences linguistic outcomes would help determine whether and how prior musical experience facilitates vocabulary acquisition. Furthermore, identifying subgroup-specific (e.g., instrumentalists versus singers) effects of musical training could provide deeper insights into its impact on vocabulary processing.

In conclusion, future research should incorporate extended intervention periods, structured scaffolding, refined instructional design, learner-specific predictors, and enhanced measurement strategies to optimize the effectiveness of music-based MWU learning. Implementing these improvements will allow for a deeper investigation into the role of music-based approach in MWU learning and contribute to more effective, engaging, and pedagogically sound instructional practices.

6.5 Conclusions

This present research investigated the impact of a music-based approach—specifically, vocal training with pop songs—on the learning of MWUs in comparison to a non-music-based approach. Additionally, it examined how this approach influences learners' well-being and the occurrence of INMI, as well as the extent to which these factors contribute to MWU learning. To achieve these objectives, the research was guided by the following research questions:

- **Research Question 1**: To what extent does vocal training with selected English pop songs enhance receptive and productive MWU learning in a lower secondary EFL context compared to a non-music-based approach?

- **Research Question 2**: To what extent does vocal training with selected English pop songs foster learners' well-being compared to a non-music-based approach? Furthermore, how does well-being influence the learning of receptive and productive English MWUs?

- **Research Question 3**: To what extent does vocal training with selected English pop songs induce INMI? Moreover, how does INMI facilitate the learning of receptive and productive English MWUs?

Findings revealed that vocal training with pop songs significantly enhanced MWU learning, with moderate-to-large effect sizes in the test group. However, between-group differences were not statistically significant, suggesting that while music-based approach supported MWU learning, it was not conclusively more effective than a non-music-based approach. Additionally, prior English MWUs knowledge emerged as the strongest predictor of MWU gains, reinforcing the incremental nature of vocabulary learning.

Beyond linguistic outcomes, the intervention enhanced participant's well-being, particularly at T1, demonstrating music's role in fostering emotional engagement and reducing anxiety. However, these effects declined by T2, suggesting that sustained exposure is necessary to maintain well-being benefits. The study also provided empirical evidence of INMI as a cognitive reinforcement mechanism, with the test group exhibiting higher INMI occurrences than the control group. While INMI occurrences were significantly associated with MWUs retention, between-group differences in MWUs gains were not statistically significant, indicating that additional factors may mediate its long-term impact.

This study filled key research gaps in music-based MWU learning, particularly in EFL instruction. While previous studies have examined music's role in vocabulary learning (e.g., Medina, 1990; Salcedo, 2010; Legg, 2009), the effects of vocal training with authentic pop songs on MWU learning had remained neglected. By systematically investigating how structured vocal training enhances MWU learning, this study provides a novel contribution to pedagogical methodologies, which have traditionally focused on isolated vocabulary items rather than MWUs.

Methodologically, this study enhanced research rigor by incorporating a control group, delayed post-tests, and multivariate statistical analyses, ensuring a robust experimental design. Unlike prior research focusing on passive music exposure, this study introduced an intensive vocal training component, highlighting the role of active musical engagement in MWU learning.

Despite its contributions, this study has several limitations, including a short intervention duration, cognitive load constraints, and prior exposure variability. Future research should explore longer interventions, structured scaffolding, and distributed practice models to further enhance MWU learning alongside INMI and well-being. Additionally, comparative studies examining musician versus non-musician differences and neuroimaging research on INMI mechanisms would provide deeper insights into the neurological underpinnings of music-based MWU learning. Future research should also expand investigations on learner-specific predictors, the role of INMI, and the long-term effects of musical training to refine music-based interventions for MWU learning.

Beyond its research contributions, this study offered implications for educational policy and curriculum development by highlighting the value of music as a structured and evidence-based tool for vocabulary learning. As music continues to gain recognition in pedagogical practice, educators and policymakers are encouraged to adopt approaches that support cognitive and linguistic development while also enhancing learner motivation and well-being. Future research and policy efforts should prioritize sustainable integration strategies to ensure that music-enhanced instruction can be effectively adapted across diverse educational contexts.

REFERENCES

Abbott, M. (2002). Using music to promote L2 learning among adult learners. *TESOL Journal, 11*(1), 10–17. https://doi.org/10.1002/j.1949-3533.2002.tb00061.x

Abdul Razak, N. A. N., & Md Yunus, M. (2016). Using action songs in teaching action words to young ESL learners. *International Journal of Language Education and Applied Linguistics, 4*, 15–24. https://doi.org/10.15282/ijleal.v4.482

Abidin, M. J. Z., Pour-Mohammadi, M., Singh, K. K. B., Kaur, K., Azman, R., & Souriyavongsa, T. (2011). The effectiveness of using songs in YouTube to improve vocabulary competence among upper secondary school students. *Theory and Practice in Language Studies, 1*(11), 1488–1496. https://doi.org/10.4304/tpls.1.11.1488-1496

Ahissar, M., Nahum, M., Nelken, I., & Hochstein, S. (2009). Reverse hierarchies and sensory learning. *Philosophical Transactions of the Royal Society B: Biological Sciences, 364*(1515), 285–299. https://doi.org/10.1098/rstb.2008.0253

Ahlers, M. (2019). "Kollegah the Boss": A case study of persona, types of capital, and virtuosity in German gangsta rap. *Popular Music, 38*(3), 457–480. https://doi.org/10.1017/S0261143019000473

Aiello, R., & Sloboda, A. (1994). Music performance: Expression and the development of excellence. In R. Aiello (Ed.), *Musical perceptions, 1*, 152–169. Oxford University Press. https://philpapers.org/rec/AIEMP

Aitchison, J. (1994). *Words in the mind: An introduction to the mental lexicon* (2nd ed.). Blackwell. https://content.e-bookshelf.de/media/reading/L-592780-7b1f5eefb8.pdf

Aitchison, J. (2003). *Words in the Mind. An Introduction to the Mental Lexicon* (3rd ed.). Blackwell.

Alabau, I., Bonnet, G., de Bot, K., Bramsbye, J., Dauphin, L., Erickson, G., Etelälahti, A., Evers, R., Hesse, H., Ibsen, E., Kühnbach, O., Lagergren, T., Levasseur, J., Nielsen, L., de Quay, P., Tuokko, E., & Vrignaud, P. (2002). *The assessment of pupils' skills in English in eight European countries: A European project.* European Network of Policy Makers for the Evaluation of Educational Systems.

Albaladejo Albaladejo, S., Coyle, Y., & de Larios, J. R. (2018). Songs, stories, and vocabulary acquisition in preschool learners of English as a foreign language. *System, 76*, 116–128. https://doi.org/10.1016/j.system.2018.05.002

Alexander, J. A., Wong, P. C. M., & Bradlow, A. R. (2005). Lexical tone perception in musicians and non-musicians. *Proceedings of Interspeech 2005*, 397–400. https://doi.org/10.21437/Interspeech.2005-271

Alipour, M., Gorjian, B., & Zafari, I. (2012). The effects of songs on EFL learners' vocabulary recall and retention: The case of gender. *Advances in Digital Multimedia, 1*(3), 140–143.

Alisaari, J., & Heikkola, L. M. (2016). Increasing fluency in L2 writing with singing. *Studies in Second Language Learning and Teaching, 6*(2), 271–292. https://doi.org/10.14746/ssllt.2016.6.2.5

Allen, L. S., & Gorski, R. A. (1991). Sexual dimorphism of the anterior commissure and massa intermedia of the human brain. *Journal of Comparative Neurology, 312*(1), 97–104. https://doi.org/10.1002/cne.903120108

Almurshed, H. M., & Aljuaythin, W. (2019). Does high anxiety decrease motivation for learning English as a foreign language? *International Journal of Applied Linguistics & English Literature, 8*(2), 113. https://doi.org/10.7575/aiac.ijalel.v.8n.2p.113

Alonso-Nanclares, L., Gonzalez-Soriano, J., Rodriguez, J. R., & DeFelipe, J. (2008). Gender differences in human cortical synaptic density. *Proceedings of the National Academy of Sciences, 105*(38), 14615–14619. https://doi.org/10.1073/pnas.0803652105

Altarriba, J., & Knickerbocker, H. (2011). Acquiring second language vocabulary through the use of images and words. In P. Trofimovich & K. McDonough (Eds.), *Applying priming methods to L2 learning, teaching and research: Insights from psycholinguistics* (pp. 21–48). John Benjamins. https://doi.org/10.1075/lllt.30.06alt

Altenmüller, E. O. (2003). How many music centres are in the brain? In I. Peretz & R. Zatorre (Eds.), *The cognitive neuroscience of music* (pp. 346–353). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198525202.003.0022

Altenmüller, E. (2006). Musikwahrnehmung und Amusier. In H. O. Karnath & P. Thier (Eds.), *Neuropsychologie* (pp. 425–436). Springer.

Altenmüller, E., Schürmann, K., Parlitz, D., & Behne, K. E. (1997). Brain activation patterns during music processing reveal emotion-related hemispheric differences. In A. Gabrielsson (Ed.), *Proceedings of the third triennial ESCOM conference* (pp. 675–680). Uppsala University Press.

Altenmüller, E., Bangert, M., Liebert, G., & Gruhn, W. (2000). Mozart in us: How the brain processes music. *Medical Problems of Performing Artists, 15*(1). https://doi.org/10.21091/mppa.2000.3020

Altenmüller, E., & Schlaug, G. (2015). Apollo's gift: New aspects of neurologic music therapy. In *Progress in Brain Research*, *217*, 237–252. Elsevier. https://doi.org/10.1016/bs.pbr.2014.11.029

Altrichter, H., & Posch, P. (1998). *Lehrer erforschen ihren Unterricht: Eine Einführung in die Methoden der Aktionsforschung* (3rd ed.). Julius Klinkhardt.

Amunts, K., Schlaug, G., Jancke, L., Steinmetz, H., Schleicher, A., & Zilles, K. (1997). Hand skills covary with the size of motor cortex: A macrostructural adaptation. *Human Brain Mapping, 5*(3), 206–215. https://doi.org/10.1002/(SICI)1097-0193(1997)5:3

Anderson, R. C., & Freebody, P. (1983). Vocabulary knowledge. In B. Hutson (Ed.), *Advances in reading/language research*, *2*, 231–250. JAI Press.

Anshel, A., & Kipper, D. (1988). The influence of group singing on trust and cooperation. *Journal of Music Therapy, 25*(3), 145–155. https://doi.org/10.1093/jmt/25.3.145

Anthony, L. (2014). *AntWordProfiler* (Version 1.4.1) [Computer software]. Waseda University. https://www.laurenceanthony.net/software/antwordprofiler/

Anthony, L. (2018). *Introducing English for Specific Purposes*. Routledge.

Anthony, L., & Nation, P. (2017). *Picture Vocabulary Size Test* (Version 1.2.0) [Computer software]. Waseda University. https://www.laurenceanthony.net/software/pvst/releases/PVST120/help.pdf?utm_source=chatgpt.com

Anton, R. J. (1990). Combining singing and psychology. *Hispania, 73*(4), 1166–1170. https://doi.org/10.2307/344326

Anvari, S. H., Trainor, L. J., Woodside, J., & Levy, B. A. (2002). Relations among musical skills, phonological processing, and early reading ability in preschool children. *Journal of Experimental Child Psychology, 83*(2), 111–130. https://doi.org/10.1016/S0022-0965(02)00124-8

Aquil, R. (2012). Revisiting songs in language pedagogy. *Journal of the National Council of Less Commonly Taught Languages*, *11*, 75–95.

Arbib, A. M., Gasser, B., & Barrès, V. (2013). Language is handy but is it embodied? *Neuropsychologia, 55*(1). https://doi.org/10.1016/j.neuropsychologia.2013.11.004

Arndt, J., & Sambanis, M. (2017). *Didaktik und Neurowissenschaften: Dialog zwischen Wissenschaft und Praxis*. Narr.

Arnold, J. L., & Herrick, E. (Eds.). (2017). *New ways in teaching with music*. TESOL Press.

Arnon, I., & Snider, N. (2010). More than words: Frequency effects for multi-word phrases. *Journal of Memory and Language, 62*(1), 67–82. https://doi.org/10.1016/j.jml.2009.09.005

Arnon, I., & Clark, E. V. (2011). Why "brush your teeth" is better than "teeth": Children's word production is facilitated in familiar sentence frames. *Language Learning and Development, 7*(2), 107–129. https://doi.org/10.1080/15475441.2010.505489

Arnon, I., & Priva, U. C. (2014). Time and again: The changing effect of word and multiword frequency on phonetic duration for highly frequent sequences. *Mental Lexicon, 9*(3), 377–400. https://doi.org/10.1075/ml.9.3.01arn

Ashby, F. G., Isen, A. M., & Turken, A. U. (1999). A neuropsychological theory of positive affect and its influence on cognition. *Psychological Review, 106*(3), 529–550. https://doi.org/10.1037/0033-295X.106.3.529

Ashtiani, F. T., & Zafarghandi, A. M. (2015). The effect of English verbal songs on connected speech aspects of adult English learners' speech production. *Advances in Language and Literary Studies, 6*(1), 212–226. https://doi.org/10.7575/aiac.alls.v.6n.1p.212

Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: A proposed system and its control processes. In K. W. Spence & J. T. Spence (Eds.), *The psychology of learning and motivation, 2* (pp. 89–195). Academic Press.

Augurzky, P. (2006). *Attaching relative clauses in German: The role of implicit and explicit prosody in sentence processing, 77.* MPI Series in Human Cognitive and Brain Science.

Aviad-Levitzky, T., Laufer, B., & Goldstein, Z. (2019). The new Computer Adaptive Test of Size and Strength (CATSS): Development and validation. *Language Assessment Quarterly, 16*(3), 345–368. https://doi.org/10.1080/15434303.2019.1649409

Ayotte, S. (2004). *The acquisition of verb forms through song* (Publication No. 3356A). Michigan State University. ProQuest Dissertations and Theses Global.

Azaryad Shechter, D. (2018). Overcoming the grammar barrier in foreign language learning: The role of television series. *Journal of Language and Education, 4*(2), 92–104. https://doi.org/10.17323/2411-7390-2018-4-2-92-104

Bachman, L. F., & Palmer, A. S. (1996). *Language testing in practice: Designing and developing useful language tests*. Oxford University Press.

Baddeley, A. D. (2000). The episodic buffer: A new component of working memory? *Trends in Cognitive Sciences, 4*(11), 417–423. https://doi.org/10.1016/S1364-6613(00)01538-2

Baddeley, A. D. (2003). Working memory: looking back and looking forward. *Nature Reviews Neuroscience, 4*(10), 829-839. https://doi.org/10.1038/nrn1201

Baddeley, A. D., & Hitch, G. J. (1974). Working memory. In G. A. Bower (Ed.), *The psychology of learning and motivation, 8*, pp. 47–89. Academic Press. https://doi.org/10.1016/S0079-7421(08)60452-1

Baddeley, A. D., Hitch, G. J., & Allen, R. J. (2009). Working memory and binding in sentence recall. *Journal of Memory and Language, 61*(3), 438–456. https://doi.org/10.1016/j.jml.2009.05.004

Baez, S., Flichtentrei, D., Prats, M., Acevedo, J., Lipina, S. J., & Manes, F. (2017). Men, women…who cares? A population-based study on sex differences and gender roles in empathy and moral cognition. *PLoS ONE, 12*(6), e0179336. https://doi.org/10.1371/journal.pone.0179336

Baills, F., Zhang, Y., Cheng, Y., Bu, Y., & Prieto, P. (2021). Listening to songs and singing benefitted initial stages of second language pronunciation but not recall of word meaning. *Language Learning, 71*(2), 369–413. https://doi.org/10.1111/lang.12442

Baker, C. (2011). *Foundations of bilingual education and bilingualism* (5th ed.). Multilingual Matters.

Baker, W. (2015). *Culture and identity through English as a lingua franca*. De Gruyter. https://doi.org/10.1515/9781501502149

Baker, C., & Prys Jones, S. (1998). E*ncyclopedia of bilingualism and bilingual education*. Multilingual Matters.

Balenović, K., & Prorokovic, J. (2023). Foreign language vocabulary development: Media–driven learning in the informal context. *Suvremena Lingvistika, 49*(96), 175–201. https://doi.org/10.22210/suvlin.2023.096.01

Banai, K., Hornickel, J., Skoe, E., Nicol, T., Zecker, S., & Kraus, N. (2009). Reading and subcortical auditory function. *Cerebral Cortex, 19*(11), 2699–2707. https://doi.org/10.1093/cercor/bhp024

Bancroft, W. J. (1985). Music therapy and education. *Journal of the Society for Accelerative Learning and Teaching, 10*(1), 3–19. ERIC Document Reproduction No. ED 285 414.

Bandura, A. (1997). *Self-efficacy: The task of control.* W. H. Freeman.

Bangert, M., & Altenmüller, E. (2003). Funktionelle und dysfunktionelle Plastizität bei Musikern. *Musikphysiologie und Musikermedizin, Neuroforum, 10*(3). https://doi.org/10.1515/nf-2003-0202

Bangert, M., Peschel, T., Schlaug, G., Rotte, M., Drescher, D., Hinrichs, H., Heinze, H. J., & Altenmüller, E. (2006). Shared networks for auditory and motor processing in professional pianists: Evidence from fMRI conjunction. *NeuroImage, 3*(3), 917–926. https://doi.org/10.1016/j.neuroimage.2005.10.044

Bannard, C., & Matthews, D. (2008). Stored word sequences in language learning: The effect of familiarity on children's repetition of four-word combinations. *Psychological Science, 19*(3), 241–248. https://doi.org/10.1111/j.1467-9280.2008.02075.x

Barber, E. J. W. (1980). Language acquisition and applied linguistics. *ADFL Bulletin, 12*(2), 26–32. https://doi.org/10.1632/adfl.12.1.26

Barcroft, J. (2007). Effects of opportunities for word retrieval during second language vocabulary learning. *Language Learning, 57*(1), 35–56. https://doi.org/10.1111/j.1467-9922.2007.00401.x

Bare, L. C., & Dundes, L. (2004). Strategies for combating dental anxiety. *Journal of Dental Education, 68*(11), 1172–1177. https://doi.org/10.1002/j.0022-0337.2004.68.11.tb03862.x

Barlow, D. H. (2011). *Unified protocol for transdiagnostic treatment of emotional disorders: Therapist guide.* Oxford University Press.

Barnard, H. (1961). A test of PUC students' vocabulary in Chotanagpur. *Bulletin of the Central Institute of English, 1*, 90–100. https://doi.org/10.1177/00336882880190020

Barsalou, L. W. (1999). Perceptual symbol systems. *Behavioral and Brain Sciences, 22*(4), 577–609. https://doi.org/10.1017/S0140525X99002149

Basso, K. (1996). Wisdom sits in places: Notes on Western Apache landscape. In S. Feld & K. Basso (Eds.), *Senses of place* (pp. 53-90). School of American Research Press.

Bates, E., Reilly, J., Wulfeck, B., Dronkers, N., Opie, M., Fenson, J., et al. (2001). Differential effects of unilateral lesions on language production in children and adults. *Brain and Language, 79*(2), 223–265. https://doi.org/10.1006/brln.2001.2482

Baumert, J., Maaz, K., Gresch, C., McElvany, N., Anders, N., Jonkmann, K., Klingebiel, F., Kropf, M., Kurtz, T., Maaz, K., McElvany, N., Milek, A., Nagy, G., Neumann, M., Schnitger, D., Szczesny, M., Trautwein, U., Watermann, R. (2010). *Der Übergang von der Grundschule in die weiterführende Schule: Leistungsgerechtigkeit und regionale, soziale und ethnisch-kulturelle Disparitäten– Zusammenfassung der zentralen Befunde*. Bundesministerium für Bildung und Forschung (BMBF).

Baur, S. R. (1990). *Superlearning und Suggestopädie: Grundlagen, Anwendung, Kritik, Perspektiven. Fremdsprachenunterricht in Theorie und Praxis*. Langenscheidt.

Beaman, C. P., & Williams, T. I. (2010). Earworms ("stuck song syndrome"): Towards a natural history of intrusive thoughts. *British Journal of Psychology, 101*(4), 637–653. https://doi.org/10.1348/000712609X479636

Beck, H., Anastasiadou, S., & Meyer zu Reckendorf, C. (2016). *Faszinierendes Gehirn: Eine bebilderte Reise in die Welt der Nervenzellen*. Springer Spektrum.

Bedford, D. A. (1985). Spontaneous playback of the second language: A descriptive study. *Foreign Language Annals, 18*(4), 279–287.

Behrens, H. (2009). Usage-based and emergentist approaches to language acquisition. *Linguistics, 47*(2), 383–411. https://doi.org/10.1515/LING.2009.014

Bell, J., & Gower, R. (1998). Writing course materials for the world: A great compromise. In B. Tomlinson (Ed.), *Materials development in language teaching* (pp. 116–129). Cambridge University Press.

Bell, E. C., Willson, M. C., Wilman, A. H., Dave, S., & Silverstone, P. H. (2006). Males and females differ in brain activation during cognitive tasks. *NeuroImage, 30*(2), 529–538. https://doi.org/10.1016/j.neuroimage.2005.09.049

Bengtsson, S. L., Nagy, Z., Skare, S., Forsman, L., Forssberg, H., & Ullén, F. (2005). Extensive piano practicing has regionally specific effects on white matter development. *Nature Neuroscience, 8*(9), 1148–1150. https://doi.org/10.1038/nn1516

Benítez-Burraco, A., & Nikolsky, A. (2023). The (co)evolution of language and music under human self-domestication. *Human Nature, 34*(2), 229–275. https://doi.org/10.1007/s12110-023-09447-1

Benson, P. (2011). Language learning and teaching beyond the classroom: An introduction to the field. In P. Benson & H. Reinders (Eds.), *Beyond the language classroom* (pp. 7–16). Palgrave Macmillan.

Benz, S., Sellaro, R., Hommel, B., & Colzato, L. S. (2016). Music makes the world go round: The impact of musical training on non-music-based cognitive functions-A review. *Frontiers in Psychology, 6*, Article 2003. https://doi.org/10.3389/fpsyg.2015.02003

Bermudez, P., Lerch, J. P., Evans, A. C., & Zatorre, R. J. (2009). Neuroanatomical correlates of musicianship as revealed by cortical thickness and voxel-based morphometry. *Cerebral Cortex, 19*(7), 1583–1596. https://doi.org/10.1093/cercor/bhn196

Berridge, K. C., & Robinson, T. E. (1998). What is the role of dopamine in reward: Hedonic impact, reward learning, or incentive salience? *Brain Research Reviews, 28*(3), 309–369. https://doi.org/10.1016/S0165-0173(98)00019-8

Besson, M., & Faïta, F. (1995). An event-related potential (ERP) study of musical expectancy: Comparison of musicians with non-musicians. *Journal of Experimental Psychology: Human Perception and Performance, 21*(6), 1278–1296. https://doi.org/10.1037/0096-1523.21.6.1278

Besson, M., Faïta, F., Czternasty, C., & Kutas, M. (1997). What's in a pause: Event-related potential analysis of temporal disruptions in written and spoken sentences. *Biological Psychology, 43*(3), 3–23. https://doi.org/10.1016/S0301-0511(96)05215-5

Besson, M., Chobert, J., & Marie, C. (2011). Transfer of training between music and speech: Common processing, attention, and memory. *Frontiers in Psychology, 2*, Article 94. https://doi.org/10.3389/fpsyg.2011.00094

Bhide, A., Power, A., & Goswami, U. (2013). A rhythmic musical intervention for poor readers: A comparison of efficacy with a letter-based intervention. *Mind, Brain, and Education, 7*(2), 113–123. https://doi.org/10.1111/mbe.12016

Bialystok, E. (1999). Cognitive complexity and attentional control in the bilingual mind. *Child Development, 70*(3), 636–644. https://doi.org/10.1111/1467-8624.00046

Bialystok, E. (2001). *Bilingualism in development: Language, literacy, and cognition*. Cambridge University Press.

Bialystok, E. (2014). Language experience changes language and cognitive ability: Implications for social policy. In B. Spolsky, O. Inbar-Lourie, & M. Tanenbaum (Eds.), *Challenges for language education and policy: Making space for people* (pp. 259–269). Routledge.

Bialystok, E., Craik, F. I. M., & Luke, G. (2008). Cognitive control and lexical access in younger and older bilinguals. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 34*(4), 859–873. https://doi.org/10.1037/0278-7393.34.4.859

Bialystok, E., Craik, F. I. M., Green, D. W., & Gollan, T. H. (2009). Bilingual minds. *Psychological Science in the Public Interest, 10*(3), 89–129. https://doi.org/10.1177/1529100610387084

Bialystok, E., & Barac, R. (2013). Cognitive effects. In F. Grosjean & P. Li (Eds.), *The psycholinguistics of bilingualism* (pp. 192–213). Wiley-Blackwell.

Bidelman, G. M., & Krishnan, A. (2010). Effects of reverberation on brainstem representation of speech in musicians and non-musicians. *Brain Research, 1355*, 112–125. https://doi.org/10.1016/j.brainres.2010.07.100

Billows, J. (1975). For a pedagogy of the song-poem. *French Review, 49*(1), 23–31.

Bishop, K. M., & Wahlsten, D. (1997). Sex differences in the human corpus callosum: Myth or reality? *Neuroscience & Biobehavioral Reviews, 21*, 581–601. https://doi.org/10.1016/S0149-7634(96)00042-9

Bleyhl, W., & Timm, J.-P. (Eds.). (1998). Wortschatz und Grammatik im Kontext. In J.-P. Timm (Ed.), *Englisch lernen und lehren: Didaktik des Englischunterrichts* (pp. 259–271). Cornelsen.

Bleyhl, W. (2004). Das Menschenbild als Basis für eine Didaktik des Fremdsprachenunterrichts. *Zeitschrift für Fremdsprachenforschung, 2*(2004), 207–235. https://doi.org/10.1017/CBO9780511997105.008

Blood, A. J., & Zatorre, R. J. (2001). Intensely pleasurable responses to music correlate with activity in brain regions implicated in reward and emotion. *Proceedings of the National Academy of Sciences of the United States of America, 98*(20), 11818–11823. https://doi.org/10.1073/pnas.191355898

Boers, F., Eyckmans, J., Kappel, J., Stengers, H., & Demecheleer, M. (2006). Formulaic sequences and perceived oral proficiency: Putting a lexical approach to the test. *Language Teaching Research, 10*(3), 245–261. https://doi.org/10.1191/1362168806lr195oa

Boers, F., & Lindstromberg, S. (2009). *Optimizing a lexical approach to instructed second language acquisition*. Palgrave Macmillan.

Böttger, H. (2016). *Neurodidaktik des frühen Sprachenlernens: Wo die Sprache zuhause ist*. Julius Klinkhardt.

Bolitho, R., Carter, R., Hughes, R., Ivanic, R., Masuhara, H., & Tomlinson, B. (2003). Ten questions about language awareness. *ELT Journal, 57*(3), 251–259. https://doi.org/10.1093/elt/57.3.251

Bonilla-Salazar, E. M. (2019). Tuning the chords of youth identity: A community-based project focused on music in English. *GiST Education and Learning Research Journal, 18*, 48–67. https://doi.org/10.26817/16925777.485

Borchgrevink, H. (1982). Prosody and musical rhythm are controlled by the speech hemisphere. In M. Clyne (Ed.), *Music, mind, and brain* (pp. 151–157). Plenum Press.

Bornstein, M. H., Hahn, C.-S., & Haynes, O. M. (2004). Specific and general language performance across early childhood: Stability and gender considerations. *First Language, 24*(2), 267–303. http://dx.doi.org/10.1177/0142723704045681

Bostrom, N., & Sandberg, A. (2009). Cognitive enhancement: Methods, ethics, regulatory challenges. *Science and Engineering Ethics, 15*(3), 311–341. https://doi.org/10.1007/s11948-009-9142-5

Botari, S., & Evans, J. (1982). Effects of musical context, type of vocal presentation, and time on the verbal retention abilities of visual-spatially oriented and verbally oriented learning disabled children. *Journal of School Psychology, 20*(4), 324–338. https://doi.org/10.1901/jaba.2011.44-647

Bower, G. H. (1970). Organizational factors in memory. *Cognitive Psychology, 1*, 18–46. https://doi.org/10.1016/0010-0285(70)90003-4

Brademann, S. (2009). Die Bedeutung des Übergangs von der Grundschule in die weiterführenden Schulen: Schulpädagogische Kontroversen und Positionen. In *Landesinstitut für Lehrerfortbildung- Lehrerweiterbildung und Unterrichtsforschung Sachsen-Anhalt (LISA)* (Ed.), *Brücken bauen: Die Gestaltung von Übergängen in der Schule*. Halle, Germany: n. p.http://www.bildung-lisa.de/file/acffa7cd398748da94b20e889f10dea3/Hier.pdf

Brandler, S., & Rammsayer, T. H. (2003). Differences in mental abilities between musicians and non-musicians. *Psychology of Music, 31*, 123–138. https://doi.org/10.1177/0305735603031002290

Brandt, A., Gebrian, M., & Slevc, L. R. (2012). Music and early language acquisition. *Frontiers in Psychology, 3*(327). https://doi.org/10.3389/fpsyg.2012.00327

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brevik, L. M. (2016). The gaming outliers: Does out-of-school gaming improve boys' reading skills in English as a second language? *Educational technology and polycontextual bridging,* pp. 39–61. https://doi.org/10.1007/978-94-6300-645-3_3

Brevik, L. M., & Holm, T. (2022). Affinity and the classroom: Informal and formal L2 learning. *ELT Journal, 76*(1), 12. https://doi.org/10.1093/elt/ccac0

Brewster, J., & Ellis, G. (2003). *The primary English teacher's guide* (New ed., 2nd impression). Penguin.

British Council. (2013). *The English effect: The impact of English, what it's worth to the UK and why it matters to the world.*

Brown, J. D. (1995). *The elements of language curriculum: A systematic approach to program development.* Heinle & Heinle.

Brown, S. (2000). The "musilanguage" model of music evolution. In N. L. Wallin, B. Mercer, & S. Brown (Eds.), *The origin of music* (pp. 271–300). MIT Press.

Brown, D. H. (2004). *Language Assessment: Principles and Classroom Practices.* Longman.

Brown, S., Martinez, M. J., Hodges, D. A., Fox, P. T., & Parsons, L. M. (2004). The song system of the human brain. *Brain Research Cognitive Brain Research, 20*, 363–375. https://doi.org/10.1016/j.cogbrainres.2004.03.001

Brown, S., Martinez, M. J., & Parsons, L. M. (2006). Music and language side by side in the brain: A PET study of the generation of melodies and sentences. *European Journal of Neuroscience, 23*(10), 2791–2803. https://doi.org/10.1111/j.1460-9568.2006.04785.x

Brown, R., Waring, R., & Donkaewbua, S. (2008). Incidental vocabulary acquisition from reading, reading-while-listening, and listening to stories. *Reading in a Foreign Language, 20*(2), 136–163. https://doi.org/10.64152/10125/66816

Burke, K. (1973). *The philosophy of literary form: Studies in symbolic action*. University of California Press.

Burman, D. D., Bitan, T., & Booth, J. R. (2007). Sex differences in neural processing of language among children. *Neuropsychologia, 46*, 1349–1362. https://doi.org/10.1016/j.neuropsychologia.2007.01.021

Busse, V., Jungclaus, J., Roden, I., Russo, F. A., & Kreutz, G. (2018). Combining song- and speech-based language teaching: An intervention with recently migrated children. *Frontiers in Psychology, 9*, 2386. https://doi.org/10.3389/fpsyg.2018.02386

Busse, V., Hennies, C., Kreutz, G., & Roden, I. (2021). Learning grammar through singing? An intervention with EFL primary school learners. *Learning and Instruction, 71*, Article 101372. https://doi.org/10.1016/j.learninstruc.2020.101372

Butzkamm, W. (2002). *Psycholinguistik des Fremdsprachenunterrichts: Vor der Mutter spräche zur Fremdsprache*. UTB.

Bygrave, P. L. (1995). Development of receptive vocabulary skills through exposure to music. *Bulletin of the Council for Research in Music Education, 127*, 28–34. https://www.jstor.org/stable/i40013244

Byne, W., Bleier, R., & Houston, L. (1988). Variations in human corpus callosum do not predict gender: A study using magnetic resonance imaging. *Behavioral Neuroscience, 102*, 222–227. https://doi.org/10.1037/0735-7044.102.2.222

Byne, W., Lasco, M. S., Kemether, E., Shinwari, A., Edgar, M. A., Morgello, S., et al. (2000). The interstitial nuclei of the human anterior hypothalamus: An investigation of sexual variation in volume and cell size, number, and density. *Brain Research, 856*, 254–258. https://doi.org/10.1016/S0006-8993(00)02127-4

Byram, M. (1997). *Teaching and assessing intercultural communicative competence*. Multilingual Matters.

Calabresi, P., Giacomini, P., Centonze, D., & Bernardi, G. (2000). Levodopa-induced dyskinesia: A pathological form of striatal synaptic plasticity? *Annals of Neurology, 47*, 60–69. https://doi.org/10.1002/1531-8249(200001)47:1

Callan, D. E., Tajima, K., Callan, A. M., Kubo, R., Masaki, S., & Akahane-Yamada, R. (2003). Learning-induced neural plasticity associated with improved identification performance after training of a difficult second-language phonetic contrast. *NeuroImage, 19*, 113–124. https://doi.org/10.1016/S1053-8119(03)00020-X

Calvert, S. L., & Tart, M. (1993). Song versus verbal forms for very-long-term, long-term, and short-term verbatim recall. *Journal of Applied Developmental Psychology, 14*, 245–260. https://doi.org/10.1016/0193-3973(93)90035-T

Calvert, S. L., & Billingsley, R. L. (1998). Young children's recitation and comprehension of information presented by songs. *Journal of Applied Developmental Psychology, 19*(1), 97–108. https://doi.org/10.1016/S0193-3973(99)80030-6

Campbell, M. (2006). *The beat goes on: Popular music in America*. Thomson Schirmer.

Carroll, D. (2000). *Psychology of language*. Brooks/Cole/Thomson Learning Asia.

Caspari, D., Klippel, F., Legutke, M. K., & Schramm, K. (Eds.). (2016). *Forschungsmethoden in der Fremdsprachendidaktik: Ein Handbuch*. Narr Francke Attempto Verlag GmbH & Co. KG.

Cassady, J. C., Mohammed, A., & Mathieu, L. (2004). Cross-cultural differences in test perceptions: Women in Kuwait and the United States. *Journal of Cross-Cultural Psychology, 35*, 713–718. https://doi.org/10.1177/0022022104270113

Castro Huertas, I. A., & Navarro Parra, L. J. (2014). The role of songs in first-graders' oral communication development in English. *Profile: Issues in Teachers' Professional Development, 16*(1), 11–28. https://doi.org/10.15446/profile.v16n1.37178

Catterall, J., Chapleau, R., & Iwanaga, J. (1999). Involvement in the arts and human development: General involvement and intensive involvement in music and theatre arts. In E. B. Fiske (Ed.), *Champions of change: The impact of the arts on learning* (pp. 1–18). The President's Committee on the Arts and Humanities and The Arts Education Partnership.

Celce-Murcia, M. (1991). Grammar pedagogy in second and foreign language teaching. *TESOL Quarterly, 25*(3), 459–480. https://doi.org/10.2307/3586980

Cenoz, J. (2003). The additive effect of bilingualism on third language acquisition: A review. *International Journal of Bilingualism, 7*(1), 71–87. https://doi.org/10.1177/13670069030070010 50

Çevikbaş, G., Yumurtacı, N., & Mede, E. (2018). Effects of songs on the development of vocabulary among first grade EFL learners. *Language Teaching and Educational Research, 1*(2), 101–120.

Chambers, C. K. (1980). *Non-lexical vocables in Scottish traditional music* (Unpublished doctoral thesis). University of Edinburgh, Edinburgh.

Chan, A. S., Ho, Y. C., & Cheung, M. C. (1998). Music training improves verbal memory. *Nature, 396*, 128. https://doi.org/10.1038/24075

Charnetski, C. J., Brennan, F. X. Jr., & Harrison, J. F. (1998). Effect of music and auditory stimuli on secretory immunoglobulin A (IgA). *Perceptual and Motor Skills, 87*(3 Pt 2), 1163–1170. https://doi.org/10.2466/pms.1998.87.3f.1163

Chartrand, J. P., & Belin, P. (2006). Superior voice timbre processing in musicians. *Neuroscience Letters, 405*, 164–167. https://doi.org/10.1016/j.neulet.2006.06.053

Chen, A.-H. (2016). Perspectives upon integrating music into freshman English pronunciation training classroom. *Asian Journal of Education and Training, 2*(1), 16–22. https://doi.org/10.20448/journal.522/2016.2.1/522.1.16.22

Chen, I.-S. J. (2020). Music as a mnemonic device for foreign vocabulary learning. *English Teaching & Learning, 44*(4), 377–395. https://doi.org/10.1007/s42321-020-00049-z

Chobert, J., Marie, C., François, C., Schön, D., & Besson, M. (2011). Enhanced passive and active processing of syllables in musician children. *Journal of Cognitive Neuroscience, 23*, 3874–3887. https://doi.org/10.1162/jocn_a_00088

Chobert, J., & Besson, M. (2013). Musical expertise and second language learning. *Brain Sciences, 3*, 923–940. https://doi.org/10.3390/brainsci3020923

Chobert, J., François, C., Velo, J. L., & Besson, M. (2014). Twelve months of active musical training in 8- to 10-year-old children enhances the preattentive processing of syllabic duration and voice onset time. *Cerebral Cortex, 24*, 956–967. https://doi.org/10.3389/978-2-88945-006-0

Christiner, M., & Reiterer, S. M. (2018). Early influence of musical abilities and working memory on speech imitation abilities: Study with pre-school children. *Brain Sciences, 8*(9), Article 169. https://doi.org/10.3390/brainsci8090169

Christiner, M., Gross, C., Seither-Preisler, A., & Schneider, P. (2021). The melody of speech: What the melodic perception of speech reveals about language performance and musical abilities. *Languages, 6*(3), Article 132. https://doi.org/10.3390/languages6030132

Christov-Moore, L., Simpson, E. A., Coudé, G., et al. (2014). Empathy: Gender effects in brain and behavior. *Neuroscience and Biobehavioral Reviews, 46*(4), 604–627. DOI: 10.1016/j.neubiorev.2014.09.001

Claerr, T., & Gargan, R. (1984). The role of songs in the foreign language classroom. *OMLTA Journal*, 28–32. In B. Snyder (Ed.), *Look out world, here we come!* (ERIC Document Reproduction No. ED 254 104).

Coats, G. (2016). Analyzing song lyrics as an authentic language learning opportunity. In A. J. Moeller (Ed.), *Fostering connections, empowering communities, celebrating the world: 2016 report of the Central States Conference on the Teaching of Foreign Languages* (pp. 1–22). Terry.

Cobb, T. (2007). Computing the vocabulary demands of L2 reading. *Language Learning & Technology, 11*(3), 181–200. https://doi.org/10.64152/10125/44117

Coe, N. (1972). What use are songs in FL teaching? *International Review of Applied Linguistics in Language Teaching, 10*(4), 357–360. http://dx.doi.org/10.5539/elt.v6n2p113

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Coleman, R. (2014). Exploratory practice: Researching the impact of songs on EFL learners' verbal memory. *Journal of Second Language Teaching and Research, 3*(1).

Conklin, K., & Schmitt, N. (2008). Formulaic sequences: Are they processed more quickly than nonformulaic language by native and nonnative speakers? *Applied Linguistics, 29*, 72–89. https://doi.org/10.1093/applin/amm022

Constant, D., & Ruther, H. (1996). Sexual dimorphism in the human corpus callosum? A comparison of methodologies. *Brain Research, 727*, 99–106. https://doi.org/10.1016/0006-8993(96)00358-7

Conzett, J. (2000). Integrating collocation into a reading and writing course. In M. Lewis (Ed.), *Teaching collocation: Further developments in the lexical approach.* Language Teaching Publications.

Cooke, M., Chaboyer, W., Schluter, P., & Hiratos, M. (2005). The effect of music on preoperative anxiety in day surgery. *Journal of Advanced Nursing, 52*, 47–55. https://doi.org/10.1111/j.1365-2648.2005.03563.x

Cooper, G., & Sweller, J. (1987). The effect of schema acquisition and rule automation on mathematical problem-solving transfer. *Journal of Educational Psychology, 79*, 347–362. https://doi.org/10.1037/0022-0663.79.4.347

Council of Europe. (2001). *Common European Framework of Reference for Languages: Learning, teaching, assessment.* Cambridge University Press. https://www.coe.int/en/web/common-european-framework-reference-languages/table-1-cefr-3.3-common-reference-levels-global-scale

Coupland, J. (2000). *Small Talk.* Harlow: Pearson Education Limited.

Coveyduck, S. E. (1998). *Vocalization and its effect on the intonation of a beginning instrumentalist* (Master's thesis, University of Calgary).

Coxhead, A. (2000). A new academic word list. *TESOL Quarterly, 34*(2), 213-238. https://doi.org/10.2307/3587951

Coyle, Y., & Gómez Gracia, R. (2014). Using songs to enhance L2 vocabulary acquisition in preschool children. *ELT Journal, 68*(3), 273–285. https://doi.org/10.1093/elt/ccu015

Craik, F. I., & Lockhart, R. S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior, 11*(6), 671–684. https://doi.org/10.1016/S0022-5371(72)80001-X

Crowther, R., & Durkin, K. (1982). Sex- and age-related differences in the musical behavior, interests, and attitudes towards music of 232 secondary school students. *Educational Studies, 8*(2), 131–139. https://doi.org/10.2307/3345639

Crystal, D. (1997). *A dictionary of linguistics and phonetics* (4th ed.). Blackwell.

Crystal, D. (2003). *English as a global language* (2nd ed.). Cambridge University Press.

Cummins, J. (2008). BICS and CALP: Empirical and theoretical status of the distinction. In *Encyclopedia of language and education, 2*, (pp. 71–83). Springer.

Czarnecka, M. (2011). Formelhafte Sequenzen in der Erst- und Zweitsprache: Versuch einer Begriffsbestimmung aus psycholinguistischer Perspektive. *Germanica Wratislaviensia, 133*, 189–199. https://wuwr.pl/gwr/article/view/1976

Czinczoll, B., & Hartl, R. (1989b). Die Leistungsfeststellung und -bewertung in der Schule. 2. Teil und Schluss. *Pädagogische Welt, 43*, 275–279.

Daase, A., Hinrichs, B., & Settinieri, J. (2014). Befragung. In J. Settinieri, S. Demirkaya, A. Feldmeier, N. Gültekin-Karakoç, & C. Riemer (Eds.), *Empirische Forschungsmethoden für Deutsch als Fremd- und Zweitsprache: Eine Einführung* (pp. 103–122). Paderborn, Germany: Schöningh.

Dang, T. N. Y., Webb, S. (2016). Making an essential word list for beginners, In I. S. P. Nation, *Making and using word lists for language learning and testing* (pp. 153-167). Amsterdam: John Benjamins.

Darwin, C. (1871). *The descent of man, and selection in relation to sex* (1st ed.). John Murray.

Davidson, F., Hudson, T., & Lynch, B. (1985). Language testing: Operationalization in classroom measurement and L2 research. In M. Celce-Murcia (Ed.), *Beyond basics: Issues and research in TESOL* (pp. 371–381). Newbury House.

Davies, M. (2010). The Corpus of Contemporary American English as the first reliable monitor corpus of English. *Literary and Linguistic Computing, 25*(4), 447–464. https://doi.org/10.1093/llc/fqq018

Davis, G. M. (2017). Songs in the young learner classroom: A critical review of evidence. *English Language Teaching, 71*(4), 445–455. https://doi.org/10.1093/elt/ccw097

Davis, P., & Rinvolucri, M. (1988). *Dictation: New methods, new possibilities*. Cambridge: Cambridge University Press.

Dawson, G., Ashman, S. B., & Carver, L. J. (2000). The role of early experience in shaping behavioral and brain development and its implications for social policy. *Development and Psychopathology, 12*(4), 695–712. https://doi.org/10.1017/S0954579400004089

De Groot, A. M. B. (2006). Effects of Stimulus Characteristics and Background Music on Foreign Language Vocabulary Learning and Forgetting. *Language Learning, 56*(3), 463–506. https://doi.org/10.1111/j.1467-9922.2006.00374.x

De Guerrero, M. (1987). The din phenomenon: Mental rehearsal in the second language. *Foreign Language Annals, 20*(6), 537–548. https://doi.org/10.1111/j.1944-9720.1987.tb03053.x

De Jong, P. F., Seveke, M. J., & Van Veen, M. (2000). Phonological sensitivity and the acquisition of new words in children. *Journal of Experimental Child Psychology, 76*(3), 275–301.

De la Fuente, M. J. (2002). Negotiation and oral acquisition of L2 vocabulary: The roles of input and output in the receptive and productive acquisition of words. *Studies in Second Language Acquisition, 24*(1), 81–112. http://www.jstor.org/stable/44486595

De Wilde, V., Brysbaert, M., & Eyckmans, J. (2018). Learning English through out-of-school exposure: Which levels of language proficiency are attained and which types of input are important? *Bilingualism: Language and Cognition, 23*(1), 1–15. https://doi.org/10.1017/S1366728918001062

Degrave, P. (2019). Music in the foreign language classroom: How and why? *Journal of Language Teaching and Research, 10*(3), 412–420. https://doi.org/10.17507/jltr.1003.02

Degrave, P. (2021). The contribution of prosody to intelligibility, comprehensibility and accentedness in foreign language acquisition: Can music help? *Nederlandse Taalkunde, 26*(2), 273–298. https://doi.org/10.5117/NEDTAA2021.2.006.DEGR

DeLacoste-Utamsing, C., & Holloway, R. L. (1982). Sexual dimorphism in the human corpus callosum. *Science, 216*(4553), 1431–1432. https://doi.org/10.1126/science.7089533

Deliére, J., & Lafayette, R. C. (1985). La clef des chants: Thèmes culturels et techniques pédagogiques pour l'enseignement de la civilisation par la chanson (Songs are the key: Cultural themes and pedagogical techniques for teaching via song). *The French Review, 58*(3), 411–425.

Delis, D. C., Kramer, J. H., Kaplan, E., & Ober, B. A. (1994). *CVLT-C: California Verbal Learning Test - Children's Version*. The Psychological Corporation.

Delogu, F., Lampis, G., & Belardinelli, M. O. (2010). From melody to lexical tone: Musical ability enhances specific aspects of foreign language perception. *European Journal of Cognitive Psychology, 22*(1), 46–61. https://doi.org/10.1080/09541440802708136

DeNora, T. (2000). *Music in everyday life*. Cambridge University Press.

Denzin, N. (1970). *The Research Art in Sociology*. London: Butterworth.

Deutsch, D. (1972). Music and memory. *Psychology Today, 12*(1), 87–119.

Deutsch, D. (1999). *The psychology of music*. Academic Press.

Dewaele, J.-M., & Alfawzan, M. (2018). Does the effect of enjoyment outweigh that of anxiety in foreign language performance? *Studies in Second Language Learning and Teaching, 8*(1), 21–45. https://doi.org/10.14746/ssllt.2018.8.1.2

Dittinger, E., Barbaroux, M., D'Imperio, M., Jäncke, L., Elmer, S., & Besson, M. (2016). Professional music training and novel word learning: From faster semantic encoding to longer-lasting word representations. *Journal of Cognitive Neuroscience, 28*(10), 1584–1602. DOI: 10.1162/jocn_a_00997

Dobrota, S., & Reić Ercegovac, I. (2009). Adolescents' musical preferences with regard to some socio-demographic variables. *Obgojne Znanosti, 8*(2), 381–398.

Döring, N., & Bortz, J. (2016). *Forschungsmethoden und Evaluation in den Sozial- und Humanwissenschaften* (5th ed.). Springer.

Dörnyei, Z. (2005). *The psychology of the language learner: Individual differences in second language acquisition*. Lawrence Erlbaum.

Dörnyei, Z. (2007). *Research Methods in Applied Linguistics*. Oxford: University.

Dörnyei, Z., & Taguchi, T. (2010). *Questionnaires in second language research: Construction, administration, and processing* (2nd ed.). New York, NY: Routledge.

Dörnyei, Z., & Ushioda, E. (2011). *Teaching and researching motivation* (2nd ed.). Routledge.

Dolean, D. D. (2015). How early can we efficiently start teaching a foreign language? *European Early Childhood Education Research Journal, 23*(5), 706-719. https://doi.org/10.1080/1350293X.2015.1104047

Dolean, D. D. (2016). The effects of teaching songs during foreign language classes on students' foreign language anxiety. *Language Teaching Research, 20*(5), 638–653. https://doi.org/10.1177/1362168815606151

Dolean, D. D., & Dolean, I. (2014). The impact of teaching songs on foreign language classroom anxiety. *Philologica Jassyensia, 10*(2), 513–518. https://philologica-jassyensia.ro/wp-content/uploads/2022/06/X_1supl_DOLEAN-1.pdf

Dowdle, L. T., Brown, T. R., George, M. S., & Hanlon, C. A. (2018). Single pulse TMS to the DLPFC, compared to a matched sham control, induces a direct, causal increase in caudate, cingulate, and thalamic BOLD signal. *Brain Stimulation*, *11*(4), 789–796. https://doi.org/10.1016/j.brs.2018.02.014

Dowling, W. J. (1973). Rhythmic groups and subjective chunks in memory for melodies. *Perception & Psychophysics, 14*(1), 37–40. https://doi.org/10.3758/BF03198614

Dowling, W. J., Tillmann, B., & Ayers, D. F. (2002). Memory and the experience of hearing music. *Music Perception, 19*(2), 249–276. https://doi.org/10.1525/mp.2001.19.2.249

Duckworth, A. L., & Seligman, M. E. P. (2006). Self-discipline gives girls the edge: Gender in self-discipline, grades, and achievement test scores. *Journal of Educational Psychology, 98*(1), 198–208. https://doi.org/10.1037/0022-0663.98.1.198

Duff, P. A., & Zappa-Hollman, S. (2013). Using popular culture in language teaching. In C. Chapelle (Ed.), *The encyclopedia of applied linguistics* (pp. 5997–6002). Wiley-Blackwell. https://doi.org/10.1002/9781405198431.wbeal1239

Dunlap, M. P. (1989). *The effects of singing and solmization training on the musical achievement of beginning fifth-grade instrumental students* (Doctoral dissertation, University of Michigan). Dissertation Abstracts International, *51*(1).

Dunn, L. M., & Dunn, L. M. (1981). *Peabody Picture Vocabulary Test-Revised* (PPVT-R). American Guidance Service.

Eckert, C. (1979). Der "Ohrwurm": Zur Psychopathologie des Alltagslebens. *Psyche, 33*(6), 545–550. https://scispace.com/pdf/zur-phanomenologie-des-ohrwurms-2qjuxvks3x.pdf

Elbert, T., Pantev, C., Wienbruch, C., Rockstroh, B., & Taub, E. (1995). Increased cortical representation of the fingers of the left hand in string players. *Science, 270*(5234), 305–307. https://doi.org/10.1126/science.270.5234.305

Elley, W. (1989). Vocabulary acquisition from listening to stories. *Reading Research Quarterly, 24*(2), 174–187. https://doi.org/10.2307/747863

Elliott, C. A. (1974). Effect of vocalization on the sense of pitch of beginning band class students. *Journal of Research in Music Education, 22*(2), 120–128. https://www.jstor.org/stable/48588751

Ellis, L. (1989). *Theories of rape: Inquiries into the causes of sexual aggression.* Hemisphere Publishing Corporation.

Ellis, N. C. (1996). Sequencing in SLA: Phonological memory, chunking, and points of order. *Studies in Second Language Acquisition, 18*(1), 91–126. https://www.jstor.org/stable/44487860

Ellis, N. C. (2001). Memory for language: Phonological memory, chunking, and points of order. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 33–68). Cambridge University Press. https://assets.cambridge.org/97805218/02888/frontmatter/9780521802888_frontmatter.pdf

Ellis, R. (2008). *The study of second language acquisition* (2nd ed.). Oxford University Press.

Ellis, R., & Beaton, A. (1993). Psycholinguistic determinants of foreign language vocabulary learning. *Language Learning, 43*(4), 559–617. https://doi.org/10.1111/j.1467-1770.1993.tb00627.x

Ellis, N. C., Simpson-Vlach, R., & Maynard, C. (2008). Formulaic language in native and second language speakers: Psycholinguistics, corpus linguistics, and TESOL. *TESOL Quarterly, 42*(3), 375–396. https://doi.org/10.1002/j.1545-7249.2008.tb00137.x

Elua, I., Laws, K. R., & Kvavilashvili, L. (2012). From mind-pops to hallucinations? A study of involuntary semantic memories in schizophrenia. *Psychiatry Research, 196*(2-3), 165–170. https://doi.org/10.1126/science.270.5234.305

Engh, D. (2013). Effective use of music in language learning: A needs analysis. *Humanizing Language Teaching, 15*(5).

Erdemir, A., & Rieser, J. (2016). Singing without hearing: The use of auditory and motor information when singers, instrumentalists, and nonmusicians sing a familiar tune. *Music Perception, 33*(4), 546–560. https://doi.org/10.1525/mp.2016.33.5.546

Eriksson, M., Marschik, P. B., Tulviste, T., Almgren, M., & others. (2012). Differences between girls and boys in emerging language skills: Evidence from 10 language communities. *British Journal of Developmental Psychology, 30*(3), 326–343. https://doi.org/10.1111/j.2044-835X.2011.02042.x

Eschrich, S., Münte, T. F., & Altenmüller, E. O. (2008). Unforgettable film music: The role of emotion in episodic long-term memory for music. *BMC Neuroscience, 9*(48). https://doi.org/10.1186/1471-2202-9-48

Eskildsen, S. W. (2009). Constructing another language: Usage-based linguistics in second language acquisition. *Applied Linguistics, 30*(3), 335–357. https://doi.org/10.1093/applin/amn037

Ethnologue. (2023). *Languages of the world: English*. https://www.ethnologue.com

Faber, G. (2012). Does gender moderate dimensional comparison effects in L1 and L2 self-concepts? *Electronic Journal of Research in Educational Psychology, 10*(3), 1159–1182. https://doi.org/10.25115/ejrep.v10i28.1529

Faber, P., & Linares, C. F. M. (2001). Design of a corpus-based vocabulary for teaching English in the primary school. In M. J. Raya, P. Faber, W. Gewehr, & A. J. Peck (Eds.), *Effective foreign language teaching at the primary level: Focus on the teacher* (pp. 125–139). Peter Lang.

Fadhli, A. (2017). The use of song worksheets to enhance EFL elementary school students' vocabulary mastery. *Journal of ELT Research, 2*(1), 37–43. https://journal.uhamka.ac.id/index.php/jer/article/view/159

Falioni, J. W. (1993). Music as a means to enhance cultural awareness and literacy in the foreign language classroom. *Mid-Atlantic Journal of Foreign Language Pedagogy, 7*, 97–198. (ERIC Document Reproduction No. ED 355 796).

Farrant, D. (2022). 25 Of The Greatest And Most Famous Pop Singers Of All Time. *Hello Music Theory*. https://hellomusictheory.com/learn/famous-pop-singers/

Federmeier, K. D., Wlotko, E. W., & Meyer, A. M. (2008). What's "right" in language comprehension: Event-related potentials reveal right hemisphere language capabilities. *Language and Linguistics Compass, 2*(1), 1–17. https://doi.org/10.1111/j.1749-818X.2007.00042.x

Feld, S., & Basso, K. (Eds.). (1996). *Senses of place.* Santa Fe, NM: School of American Research Press.

Feng, T. (2016). Development of morphological awareness through English songs: A case study. *Chinese Journal of Applied Linguistics, 39*(2), 167–184. https://doi.org/10.1515/cjal-2016-0011

Fenton, W. (2024). *9 of the Greatest and Most Famous Pop Singers of All Time, 25 Best Pop Singers & Artists of all Time (Most Famous).*https://www.billboard.com/p/best-pop-stars-21st-century/

Fernald, A. (1989). Intonation and communicative intent in mothers' speech to infants: Is the melody the message? *Child Development, 60*(6), 1497–1510. https://doi.org/10.2307/1130938

Field, A.P. (2013). *Discovering statistics using SPSS* (3rd ed.). Los Angeles, CA: Sage.

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage.

Field, A. P., & Wilcox, R. R. (2017). Robust statistical methods: A primer for clinical psychology and experimental psychopathology researchers. *Behaviour Research and Therapy, 98*, 19–38.

Finnäs, L. (1989). How can musical preferences be modified? *Bulletin of the Council for Research in Music Education, 102*, 1–58. https://www.jstor.org/stable/40318309

Fisher, D. (2001). Early language learning with and without music. *Reading Horizons, 42*(1), 39–49. https://scholarworks.wmich.edu/reading_horizons/vol42/iss1/8

Fishman, J. A. (1972). Language and ethnicity. In *Bilingualism in the barrio* (pp. 65–72). University of Indiana Press.

Flege, J. E. (1995). Second language speech learning: Theory, findings, and problems. In W. Strange (Ed.), *Speech perception and linguistic experience: Issues in cross-language research* (pp. 233–277). York Press. https://www.researchgate.net/profile/James-Flege/publication/333815781_Second_language_speech_learning_Theory_findings_and_problems/links/5d071d2692851c900442d6b2/Second-language-speech-learning-Theory-findings-and-problems.pdf

Floridou, G. A., & Müllensiefen, D. (2015). Environmental and mental conditions predicting the experience of involuntary musical imagery: An experience sampling method study. *Consciousness and Cognition, 33*, 472–486. https://doi.org/10.1016/j.concog.2015.02.012

Floridou, G. A., Williamson, V. J., Stewart, L., & Müllensiefen, D. (2015). The Involuntary Musical Imagery Scale (IMIS). *Psychomusicology: Music, Mind, and Brain, 25*(1), 28–36. https://doi.org/10.1037/pmu0000067

Floridou, G. A., Williamson, V. J., & Stewart, L. (2017). A novel indirect method for capturing involuntary musical imagery under varying cognitive load. *Quarterly Journal of Experimental Psychology, 70*(11), 2189–2199. https://doi.org/10.1080/17470218.2016.1227860

Fodor, J. A. (1998). *Concepts: Where cognitive science went wrong*. Clarendon Press/Oxford University Press. https://doi.org/10.1093/0198236360.001.0001

Fonseca-Mora, C. (2000). Foreign language acquisition and melody singing. *ELT Journal, 54*(2), 146–153. https://doi.org/10.1093/elt/54.2.146

Fonseca-Mora, C., & Gant, M. (Eds.). (2016). *Melodies, rhythm, and cognition in foreign language learning*. Cambridge Scholars Publishing.

Forgeard, M., Winner, E., Norton, A., & Schlaug, G. (2008). Practicing a musical instrument in childhood is associated with enhanced verbal ability and nonverbal reasoning. *PLoS One, 3*(10), e3566. https://doi.org/10.1371/journal.pone.0003566

Foster, P., & Ohta, A. (2005). Negotiation for meaning and peer assistance in second language classrooms. *Applied Linguistics, 26*(3), 402–430. https://doi.org/10.1093/applin/ami014

Fotidzis, T. S., Moon, H., Steele, J. R., & Magne, C. L. (2018). Cross-modal priming effect of rhythm on visual word recognition and its relationships to music aptitude and reading achievement. *Brain Sciences, 8*(12), 210. https://doi.org/10.3390/brainsci8120210

François, C., & Schön, D. (2011). Musical expertise boosts implicit learning of both musical and linguistic structures. *Cerebral Cortex, 21*(11), 2357–2365. https://doi.org/10.1093/cercor/bhq279

François, C., Chobert, J., Besson, M., & Schön, D. (2013). Music training for the development of speech segmentation. *Cerebral Cortex, 23*(9), 43–51. https://doi.org/10.1093/cercor/bhs180

Franklin, M. S., Rattray, K., Moore, K. S., Moher, J., Yip, C., & Jonides, J. (2008). The effects of musical training on verbal memory. *Psychology of Music, 36*(3), 353–365. https://doi.org/10.1177/0305735607086044

Frederikse, M., Lu, A., Aylward, E., Barta, P., Sharma, T., & Pearlson, G. (2000). Sex differences in inferior parietal lobule volume in schizophrenia. *American Journal of Psychiatry, 157*(3), 422–427. https://doi.org/10.1176/appi.ajp.157.3.422

Frederiksen, J. R. (1982). A componential theory of reading skills and their interactions. In R. J. Mislevy (Ed.), *Advances in the psychology of human intelligence, 1* (pp. 235–285). Lawrence Erlbaum. https://apps.dtic.mil/sti/tr/pdf/ADA099689.pdf
Friederici, A. D., & Alter, K. (2004). Lateralization of auditory language functions: A dynamic dual pathway model. *Brain and Language, 89*(3), 267–276. https://doi.org/10.1016/S0093-934X(03)00351-1

Friedrich, G., & Preiss, G. (2002). „Lehren mit Köpfchen." *Geist & Gehirn, 4*, 64–70.

Fujioka, T., Trainor, L. J., Ross, B., Kakigi, R., & Pantev, C. (2004). Musical training enhances automatic encoding of melodic contour and interval structure. *Journal of Cognitive Neuroscience, 16*(6), 1010–1021. https://doi.org/10.1162/0898929041502706

Fujioka, T., Ross, B., Kakigi, R., Pantev, C., & Trainor, L. J. (2006). One year of musical training affects development of auditory cortical-evoked fields in young children. *Brain, 129*(10), 2593–2608. https://doi.org/10.1093/brain/awl247

Gabrielsson, A., & Lindström, E. (2010). The role of structure in the musical expression of emotions. In P. N. Juslin & J. A. Sloboda (Eds.), *Handbook of music and emotion: Theory, research, applications* (pp. 367–400). Oxford University Press.

Gagnon, L., & Peretz, I. (2003). Mode and tempo relative contributions to 'happy-sad' judgments in equitone melodies. *Cognition and Emotion, 17*(1), 25–40. https://doi.org/10.1080/02699930302279

Gairns, R., & Redman, S. (1986). *Working with words: A guide to teaching and learning vocabulary*. Cambridge University Press.

Garnett, L. (2005). Choral singing as bodily regime. *International Review of the Aesthetics and Sociology of Music*, 36(2), 249–269.

Gaser, C., & Schlaug, G. (2003). Brain structures differ between musicians and non-musicians. *Journal of Neuroscience, 23*(9), 9240–9245. https://doi.org/10.1523/JNEUROSCI.23-27-09240.2003

Gathercole, S. E., & Baddeley, A. D. (1990). The role of phonological memory in vocabulary acquisition: A study of young children learning new names. *British Journal of Psychology, 81*(3), 439–454.

Gathercole, S. E., Willis, C., Emslie, H., & Baddeley, A. D. (1991). The influences of number of syllables and wordlikeness on children's repetition of nonwords. *Applied Psycholinguistics, 12*(3), 349–367. https://doi.org/10.1017/S0142716400009267

Getie, A. S. (2020). Factors affecting the attitudes of students towards learning English as a foreign language. *Cogent Education, 7*(1), Article 1738184. https://doi.org/10.1080/2331186X.2020.1738184

Giedd, J. N., Castellanos, F. X., Rajapakse, J. C., Vaituzis, A. C., & Rapoport, J. L. (1997). Sexual dimorphism of the developing human brain. *Progress in Neuropsychopharmacology & Biological Psychiatry, 21*(7), 1185–1201. https://doi.org/10.1016/S0278-5846(97)00158-9

Gilmore, A. (2007). Authentic materials and authenticity in foreign language learning. *Language Teaching, 40*(2), 97–118. https://doi.org/10.1017/S0261444807004144

Ginsborg, J., & Sloboda, J. (2007). Singers' recall for the words and melody of new, unaccompanied song. *Psychology of Music, 35*(3), 421–440. https://doi.org/10.1177/0305735607072654

Glass, G. V., McGaw, B., & Smith, M. L. (1981). *Meta-analysis in social research.* Sage.

Glazner, M. (1976). Intonation grouping and related words in free recall. *Journal of Verbal Learning and Verbal Behavior, 15*(1), 85–92. https://doi.org/10.1016/S0022-5371(76)90009-8

Glenberg, A. M., & Robertson, D. A. (2000). Symbol grounding and meaning: A comparison of high-dimensional and embodied theories of meaning. *Journal of Memory and Language, 43*(3), 379–401. https://doi.org/10.1006/jmla.2000.2714

Glenberg, A. M., & Kaschak, M. P. (2002). Grounding language in action. *Psychonomic Bulletin & Review, 9*(3), 558–565. https://doi.org/10.3758/BF03196313

Glisan, E., & Drescher, V. (1993). Textbook grammar: Does it reflect native speaker speech? *The Modern Language Journal, 77*(1), 23–33. https://onlinelibrary.wiley.com/doi/10.1111/j.1540-4781.1993.tb01941.x

Götze, M., & Horii, Y. (1989). A comparison of the pitch accuracy of group and individual singing in young children. *Bulletin of the Council for Research in Music Education, 99*, 57–73. https://www.jstor.org/stable/40318325

Gold, C., Mössler, K., Grøcke, D., Heldal, T. O., Tjemsland, L., Aarre, T., Aarø, L. E., Rittmannsberger, H., Brynjulf, S., Assmus, J., & Rolvsjord, R. (2013). Individual music therapy for mental health care clients with low therapy motivation: Multicentre randomised controlled trial. *Psychotherapy and Psychosomatics, 82*(5), 319–331. https://doi.org/10.1159/000348452

Goldberg, A. (2006). *Constructions at work: The nature of generalization in language*. Oxford University Press.

González Arteaga, A. J. (2019). *Can the use of English songs improve A1 EFL college students' listening comprehension?* (Unpublished master's thesis). University of Cuenca, Ecuador. http://dspace.ucuenca.edu.ec/handle/123456789/33060

González-Fernández, B. (2022). Conceptualizing L2 vocabulary knowledge: An empirical examination of the dimensionality of word knowledge. *Studies in Second Language Acquisition, 44*(4), 1124–1154. https://doi.org/10.1017/S0272263121000930

Good, C. D., Johnsrude, I., Ashburner, J., Henson, R. N., Friston, K. J., & Frackowiak, R. S. (2001). Cerebral asymmetry and the effects of sex and handedness on brain structure: A voxel-based morphometric analysis of 465 normal adult human brains. *NeuroImage, 14*(3), 685–700. https://doi.org/10.1006/nimg.2001.0857

Good, A. J., Russo, F. A., & Sullivan, J. (2015). The efficacy of singing in foreign-language learning. *Psychology of Music, 43*(5), 627–640. https://doi.org/10.1177/0305735614528833

Gordon, E. E. (1988). *Learning sequences in music*. GIA Publications.

Gordon, R. L., Schön, D., Magne, C., Astésano, C., & Besson, M. (2010). Words and melody are intertwined in the perception of sung words: EEG and behavioral evidence. *PLoS ONE, 5*(5), e9889. https://doi.org/10.1371/journal.pone.0009889

Goswami, U. (2015). Sensory theories of developmental dyslexia: Three challenges for research. *Nature Reviews Neuroscience, 16*(1), 43–54. https://doi.org/10.1038/nrn3836

Grabe, W. (1991). Current developments in second language reading research. *TESOL Quarterly, 25*(3), 375–406. https://doi.org/10.2307/3586977

Graddol, D. (2000). *The future of English? A guide to forecasting the popularity of the English language in the 21st century*. British Council. https://www.teachingenglish.org.uk/sites/teacheng/files/pub_learning-elt-future.pdf

Graddol, D. (2006). *English next*. British Council. https://www.teachingenglish.org.uk/sites/teacheng/files/pub_english_next.pdf

Graham, S. (2006). Strategy instruction and the teaching of writing: A meta-analysis. *Journal of Educational Psychology, 98*(3), 633–656. https://doi.org/10.1037/0022-0663.99.3.445

Grau, M. (2009). Worlds apart? English in German youth cultures and in educational settings. *World Englishes, 28*(2), 160–174. https://doi.org/10.1111/j.1467-971X.2009.01581.x

Graves, M. (1986). Vocabulary learning and instruction. In E. Rothkopf (Ed.), *Review of research in education, 13* (pp. 49–89). American Educational Research Association. https://doi.org/10.2307/1167219

Grein, M. (2013). *Neurodidaktik: Grundlagen für Sprachlehrende*. Hubert Verlag.

Grimm, N., Meyer, M., & Volkmann, L. (2015). *Teaching English.* Narr Francke Attempto Verlag GmbH + Co. KG.

Grimm, R., Cassani, G., Gillis, S., & Daelemans, W. (2017). Facilitatory effects of multi-word units in lexical processing and word learning: A computational investigation. *Frontiers in Psychology, 8,* Article 555. https://doi.org/10.3389/fpsyg.2017.00555

Gronlund, N. E. (1998). *Assessment of student achievement* (6th ed.). Allyn and Bacon.

Gruhn, W., & Altenmüller, E. (1997). *Music, brain, and music learning: The changing of cortical activation patterns through learning*. GIA Publications. (GIML Series, Bd. 2).

Gudykunst, W. B. (2005). *Bridging differences: Effective intergroup communication*. Sage Publications.

Guglielmino, L. M. (1986). The affective edge: Using songs and music in ESL instruction. *Adult Literacy and Basic Education, 10*, 19–26.

Guidice, G. (1986). *The sea urchin embryo: A developmental biological system* (1st ed.). Springer-Verlag.

Gur, R. C., Turetsky, B. I., Matsui, M., Yan, M., Bilker, W., Hughett, P., & Gur, R. E. (1999). Sex differences in brain gray and white matter in healthy young adults: Correlations with cognitive performance. *Journal of Neuroscience, 19*(10), 4065–4072. https://doi.org/10.1523/JNEUROSCI.19-10-04065.1999

Habib, M., Gayraud, D., Oliva, A., Regis, J., Salamon, G., & Khalil, R. (1991). Effects of handedness and sex on the morphology of the corpus callosum: A study with brain magnetic resonance imaging. *Brain and Cognition, 16*(1), 41–61. https://doi.org/10.1016/0278-2626(91)90084-L

Hadian, M. (2015). The use of song lyrics in teaching listening. *Journal of English and Education, 3*(1), 96–105.

Haghverdi, H. D. (2015). The effect of song and movie on high school students' language achievement in Dehdasht. *Procedia – Social and Behavioral Sciences, 192*, 313–320. https://doi.org/10.1016/j.sbspro.2015.06.045

Hahn, S. M. (1972). The effect of music in the learning and retention of lexical items in German. http://eric.ed.gov/?id=ED119455

Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2018). Advanced issues in partial least squares structural equation modeling (PLS-SEM). Sage. https://doi.org/10.3926/oss.37

Hakuta, K. (1974). Prefabricated patterns and the emergence of structure in second language acquisition. *Language Learning, 24*(2). https://web.stanford.edu/~hakuta/Publications/(1974)-PREFABRICATED-PATTERNS-AND-THE-EMERGENCE-OF-STRUCTU.pdf

Hallam, S. (2010). The power of music: Its impact on the intellectual, social, and personal development of children and young people. *International Journal of Music Education, 28*(3), 269–289. https://doi.org/10.1177/0255761410370658

Halpern, A. R., & Bartlett, J. C. (2011). The persistence of musical memories: A descriptive study of earworms. *Music Perception, 28*(4), 425–431. https://doi.org/10.1525/mp.2011.28.4.425

Halpern, D. F., & LaMay, M. L. (2000). The smarter sex: A critical review of sex differences in intelligence. *Educational Psychology Review, 12*(2), 229–246. https://doi.org/10.1023/A:1009027516424

Halwani, G. F., Loui, P., Rüber, T., & Schlaug, G. (2011). Effects of practice and experience on the arcuate fasciculus: Comparing singers, instrumentalists, and non-musicians. *Frontiers in Psychology, 2*(156). https://doi.org/10.3389/fpsyg.2011.00156

Hamada, M., & Koda, K. (2008). Influence of first language orthographic experience on second language decoding and word learning. *Language Learning, 58*(1), 1–31. https://doi.org/10.1111/j.1467-9922.2007.00433.x

Hargreaves, D. J., & North, A. C. (2010). Experimental aesthetics and liking for music. In P. N. Juslin & J. A. Sloboda (Eds.), *The handbook of music and emotion: Theory, research, applications* (pp. 515–546). Oxford University Press.

Harmer, J. (2004). *How to teach writing*. Pearson Longman.
Harmer, J. (2007). *The practice of English language teaching*. Longman.

Harrison, R. (1997) *Employee Development*. Institute of Personnel and Development, London.

Harry, K., Magnus, J., & Keegan, D. (1993). *Distance education: New perspectives.* Routledge.

Hartshorne, J. K., & Ullman, M. T. (2006). Why girls say 'holded' more than boys. *Developmental Science, 9*(1), 21–32. https://doi.org/10.1111/j.1467-7687.2005.00459.x

Haß, F., Kiew, W., Duty, M., Müller-Hartmann, A., & Weisshaar, H. (2017). *Fachdidaktik Englisch: Tradition, Innovation, Praxis* (2nd ed.). Ernst Klett Sprachen GmbH.

Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses related to achievement*. Routledge.

Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning.* Routledge.

Hattie, J. (2015). The applicability of visible learning to higher education. *Scholarship of Teaching and Learning in Psychology, 1*(1), 79–91. https://doi.org/10.1037/stl0000021

Haudeck, H. (2008). *Fremdsprachliche Wortschatzarbeit außerhalb des Klassenzimmers: Eine qualitative Studie zu Lernstrategien und Lerntechniken in den Klassenstufen 5 und 8*. Gunter Narr Verlag.

Hazel-Obarow, S. E. (2004). *The impact of music on the vocabulary acquisition of kindergarten and first grade students* (Doctoral dissertation). Widener University.

Healey, E. C., Mallard, A. R., III, & Adams, M. R. (1976). Factors contributing to the reduction of stuttering during singing. *Journal of Speech and Hearing Research, 19*(3), 475–480. https://doi.org/10.1044/jshr.1903.475

Heatley, A., Nation, P., & Coxhead, A. (2002). *RANGE and FREQUENCY programs*. http://www.victoria.ac.nz/lals/staff/paul-nation.aspx

Hébert, E. C., & Peretz, I. (1997). Recognition of music in long-term memory: Are melodic and temporal patterns equal partners? *Memory & Cognition, 25*(4), 518–533. https://doi.org/10.3758/BF03201127

Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. Academic Press.

Heidari, A., & Araghi, S. M. (2015). A comparative study of the effects of songs and pictures on Iranian EFL learners' L2 vocabulary acquisition. *Journal of Applied Linguistics and Language Research, 2*(7), 24–35.

Hemming, J. (2009). Zur Phnomenologie des Ohrwurms. *Musikpsychologie, 20*, 184-207.

Henderson, M. I. (1957). Ancient Greek music. In *The New Oxford History of Music, 1*. Oxford University Press.

Henriksen, B. (1999). Three dimensions of vocabulary development. *Studies in Second Language Acquisition, 21*(3), 303–317. https://www.jstor.org/stable/44486441

Henry, A., Korp, H., Sundqvist, P., & Thorsen, C. (2018). Motivational strategies and the reframing of English: Activity design and challenges for teachers in contexts of extensive extramural encounters. *TESOL Quarterly, 52*(2), 247–273. https://doi.org/10.1002/tesq.394

Herberger, R. (1987). The degree of attractiveness to 15-year-old high school students in the German Democratic Republic (GDR) of different styles, genres, and trends of contemporary music: Results of a factor analysis. *Council for Research in Music Education Bulletin, 91*, 70–76.

Herholz, S. C., Lappe, C., & Pantev, C. (2009). Looking for a pattern: An MEG study on the abstract mismatch negativity in musicians and nonmusicians. *BMC Neuroscience, 10*(42). https://doi.org/10.1186/1471-2202-10-42

Herholz, S. C., & Zatorre, R. J. (2012). Musical training as a framework for brain plasticity: Behavior, function, and structure. *Neuron, 76*(3), 486–502. https://doi.org/10.1016/j.neuron.2012.10.011

Herrmann, C., & Fiebach, C. (2007). *Gehirn und Sprache.* Frankfurt am Main: Fischer Kompakt.

Hesse, H.-G., Göbel, K., & Hartig, J. (2008). Sprachliche Kompetenzen von mehrsprachigen Jugendlichen und Jugendlichen nicht-deutscher Erstsprache. In E. Klieg (Ed.), *Unterricht und Kompetenzerwerb in Deutsch und Englisch: Ergebnisse der DESI-Studie* (pp. 208–231). Beltz.

Hettel, J. (2002). Pädagogische Freiheit in der Bewertung von Klassenarbeiten. Einkleines Lehrstück aus Baden-Württemberg. *Praxis des neusprachlichen Unterrichts 49*, 420-425.

Hidri, S. (2018). *Revisiting the assessment of second language abilities: From theory to practice*. Springer.

Hilgetag, C. C. (2002). „Hinausfalle für alle!." *Geist & Gehirn, 1*, 9–13

Hirose, Y. (2003). Recycling prosodic boundaries. *Journal of Psycholinguistic Research, 32*(2), 167–195. https://doi.org/10.1023/A:1022448308035

Ho, Y. C., Cheung, M. C., & Chan, A. S. (2003). Music training improves verbal but not visual memory: Cross-sectional and longitudinal explorations in children. *Neuropsychology, 17*(3), 439–450. https://doi.org/10.1037/0894-4105.17.3.439

Hodges, D. A., & Wilkins, R. W. (2015). How and why does music move us? Answers from psychology and neuroscience. *Music Educators Journal, 101*(4), 41–47. https://doi.org/10.1177/0027432115575755

Holbrook, M. (1981). Integration of compositional and decompositional analyses to represent the intervening role of perceptions in evaluative judgments. *Journal of Marketing Research, 18*(1), 13–28. https://doi.org/10.1177/002224378101800102

Horst, M., Cobb, T., & Meara, P. (1998). Beyond a clockwork orange: Acquiring second language vocabulary through reading. *Reading in a Foreign Language, 11*, 207–223.

Horst, M., & Meara, P. (1999). Test of a model for predicting second language lexical growth through reading. *Canadian Modern Language Review/Revue canadienne des langues vivantes, 56*(2), 308–328. https://doi.org/10.3138/cmlr.56.2.308

Horwitz, E. K. (2001). Language anxiety and achievement. *Annual Review of Applied Linguistics, 21*, 112–126. https://doi.org/10.1017/S0267190501000071

Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). Foreign language classroom anxiety. *The Modern Language Journal, 70*(2), 125–132. https://doi.org/10.1111/j.1540-4781.1986.tb05256.x

Hu, M., & Nation, I. S. P. (2000). Vocabulary density and reading comprehension. *Reading in a Foreign Language, 13*(1), 403–430. https://doi.org/10.64152/10125/66973

Huberty, C. J., & Olejnik, S. (2005). *Applied MANOVA and discriminant analysis*. John Wiley & Sons, Inc.

Hughes, A. (2003). *Testing for language teachers* (2nd ed.). Cambridge University Press.

Hulme, C., Maughan, S., & Brown, G. D. (1991). Memory for familiar and unfamiliar words: Evidence for a long-term memory contribution to short-term memory span. *Journal of Memory and Language, 30*(6), 685–701. https://doi.org/10.1016/0749-596X(91)90032-F

Hulstijn, J. H. (1997). Mnemonic methods in foreign language vocabulary learning: Theoretical considerations and pedagogical implications. In J. Coady & T. Huckin (Eds.), *Second language vocabulary acquisition: A rationale for pedagogy* (pp. 203–224). Cambridge University Press.

Hulstijn, J. H. (2001). Intentional and incidental second language vocabulary learning: A reappraisal of elaboration, rehearsal, and automaticity. In P. Robinson (Ed.), *Cognition and second language instruction* (pp. 258–286). Cambridge University Press.

Hulstijn, J. H. (2013). Incidental learning in second language acquisition. In C. A. Chapelle (Ed.), *The encyclopedia of applied linguistics* (pp. 2632–2637). Blackwell Publishing Ltd.

Huron, D. (2006). *Sweet anticipation: Music and the psychology of expectation*. MIT Press.

Husain, G., Thompson, W. F., & Schellenberg, E. G. (2002). Effect of musical tempo and mode on arousal, mood, and spatial abilities. *Music Perception, 20*(2), 151–171. https://doi.org/10.1525/mp.2002.20.2.151

Husfeldt, V., Gut, M., & Bauer, F. D. (2008). *Leistungen messen, beurteilen und ausweisen: Situationsanalyse.* Aarau: Institut Forschung und Entwicklung, Zentrum Bildungsorganisation und Schulqualität. http://edudoc.ch/record/29741/files/situationsanalyse_beurteilungspraxis_08.pdf

Huss, M., Verney, J. P., Fosker, T., Mead, N., & Goswami, U. (2011). Music, rhythm, rise time perception, and developmental dyslexia: Perception of musical meter predicts reading and phonology. *Cortex, 47*(6), 674–689. https://doi.org/10.1016/j.cortex.2010.07.010

Hutchinson, S., Lee, L. H. L., Gaab, N., & Schlaug, G. (2003). Cerebellar volume: Gender and musicianship effects. *Cerebral Cortex, 13*(9), 943–949. https://doi.org/10.1093/cercor/13.9.943

Hutz, M. (2012). *Storing words in the mind: The mental lexicon and vocabulary learning* (2nd ed.). GRIN Verlag.

Hutz, M. (2013). Storing words in the mind: The mental lexicon and vocabulary learning. In M. Eisenmann & T. Summer (Eds.), *Basic issues in EFL teaching and learning* (pp. 105-118). Universitätsverlag Winter Heidelberg.

Hutz, M. (2018). Die Verankerung von Wortschatz im sensorischen und motorischen System. In M. Sambanis & H. Böttger (Eds.), *Focus on Evidence II: Fremdsprachendidaktik trifft Neurowissenschaften* (pp. 189-198). Narr Francke Attempto.

Hutz, M., & Kolb, A. (2010). Am Anfang war das Wort: Prinzipien der Wortschatzvermittlung. *Grundschulmagazin Englisch, 1*, 6–8.

Huy, Q. (1999). Emotional capability, emotional intelligence, and radical change. *Academy of Management Review, 24*(2), 324–345. https://doi.org/10.5465/AMR.1999.1893939

Hwang, H., & Schafer, A. J. (2009). Constituent length affects prosody and processing for a dative NP ability in Korean. *Journal of Psycholinguistic Research, 38*(2), 151–175. https://doi.org/10.1007/s10936-008-9091-1

Hyde, J. S. (2005). The gender similarities hypothesis. *The American Psychologist, 60*(6), 581–592. https://doi.org/10.1037/0003-066X.60.6.581

Hyde, K. L., Lerch, J., Norton, A., Forgeard, M., Winner, E., Evans, A. C., & Schlaug, G. (2009). Music training shapes structural brain development. *Journal of Neuroscience, 29*(10), 3019–3025. https://doi.org/10.1523/JNEUROSCI.5118-08.2009

Hyman, I. E., & Rubin, D. C. (1990). Memorabeatlia: A naturalistic study of long-term memory. *Memory & Cognition, 18*(2), 205–214. https://doi.org/10.3758/BF03197096

Hyman, I.E, Burland, N.K., Duskin, H.M., Cook, M.C., Roy, C.M., McGrath, J.C., & Roundhill, R.F. (2013). Going gaga: Investigating, creating, and manipulating the song stuck in my head. *Applied Cogntivie Psychology, 27*, 204-215. https://doi.org/10.1002/acp.2897

Iantorno, G., & Papa, M. (1979). The use of songs in the language class. *Rassegna Italiana di Linguistica Applicata, 11*(1–2), 179–185.

Ikezawa, S., Nakagome, K., Mimura, M., Shinoda, J., Itoh, K., Homma, I., & Kamijima, K. (2008). Gender differences in lateralization of mismatch negativity in dichotic listening tasks. *International Journal of Psychophysiology, 68*(1), 41–50. https://doi.org/10.1371/journal.pone.0054080

Imfeld, A., Oechslin, M. S., Meyer, M., Loenneker, T., & Jäncke, L. (2009). White matter plasticity in the corticospinal tract of musicians: A diffusion tensor imaging study. *NeuroImage, 46*(3), 600–607. https://doi.org/10.1016/j.neuroimage.2009.02.025

Ingenkamp, K. (1977). *Die Fragwürdigkeit der Zensurengebung. Texte und Untersuchungsberichte* (7th ed.). Beltz.

Inglis, J., & Lawson, J. (1881). Sex differences in the effects of unilateral brain damage on intelligence. *Science, 212*(4494), 693–695. https://doi.org/10.1126/science.7221560

Institut für Schulentwicklungsforschung. (2021). *IGLU: Internationale Grundschul-Lese-Untersuchung*. Technische Universität Dortmund.

Isen, A. M. (2009). A role for neuropsychology in understanding the facilitating influence of positive affect on social behavior and cognitive processes. In S. J. Lopez & C. R. Snyder (Eds.), *Oxford handbook of positive psychology* (2nd ed., pp. 503–518). Oxford University Press.

Isen, A. M., & Labroo, A. A. (2003). Some ways in which positive affect facilitates decision making and judgment. In S. L. Schneider & J. Shanteau (Eds.), *Emerging perspectives on judgment and decision research* (pp. 365–393). Cambridge University Press.

Isern, B. (1958). The influence of music upon the memory of mentally retarded children. *Music Therapy, 58*, 162–165. https://doi.org/10.5539/mas.v6n4p106

Jäncke, L. (2018). Sex/gender differences in cognition, neurophysiology, and neuroanatomy. *F1000Research, 7*, F1000 Faculty Rev-805. https://doi.org/10.12688/f1000research.13917.1

Jäncke, L., Langer, N., & Hänggi, J. (2015). Diminished whole-brain but enhanced peri-Sylvian connectivity in absolute pitch musicians. *Journal of Neuropsychology, 9*(2), 276–294. https://doi.org/10.1162/jocn_a_00227

Jakobson, L. S., Cuddy, L. L., & Kilgour, A. R. (2003). Time tagging: A key to musicians' superior memory. *Music Perception, 20*(3), 307–313. https://doi.org/10.1525/mp.2003.20.3.307

Jalongo, M., & Bromley, K. (1984). Developing Linguistic Competence through Song Picture Books. *Reading Teacher, 37*(9), 840–845. http://www.jstor.org/stable/20198634

Janata, P., & Grafton, S. T. (2003). Swinging in the brain: Shared neural substrates for behaviors related to sequencing and music. *Nature Neuroscience, 6*(7), 682–687. https://doi.org/10.1038/nn1081

Javadi-Safa, A. (2018). Effects of using songs on adult EFL learners' vocabulary learning. *Journal of Applied Linguistics and Language Research, 5*(3), 101–112.

Janetschek, S. S., Frieder, K., & Lothwesen, K. (2023). Wahrnehmungen und Erleben von Ohrwürmern bei Musikstudierenden und Nicht-Musikstudierenden: Zusammenhänge mit Arbeitsgedächtnis, Tonhöhenvorstellungen und musikalischer Erfahrenheit. *Jahrbuch Musikpsychologie, 31*(165). https://doi.org/10.5964/jbdgm.165

Jenkins, J. (2014). *Global Englishes: A resource book for students* (3rd ed.). Routledge.

Jenkins, J. R., & Dixon, R. (1983). Vocabulary learning. *Contemporary Educational Psychology, 8*(3), 237–260. https://doi.org/10.1016/0361-476X(83)90016-4

Jenkins, J. R., Stein, M. L., & Wysocki, K. (1984). Learning vocabulary through reading. *American Educational Research Journal, 21*(4), 767–787. https://doi.org/10.2307/1163000

Jensen, E. (1998). *Joyful fluency: Brain-compatible second language acquisition.* Corwin Press.

Jensen, S. H. (2017). Gaming as an English language learning resource among young children in Denmark. *CALICO Journal, 34*(1), 1–19. https://doi.org/10.1558/cj.29519

Jentschke, S. (2016). The relationship between music and language. In S. Hallam, I. Cross, & M. Thaut (Eds.), *The Oxford handbook of music psychology* (pp. 343–355). Oxford University Press.

Jentschke, S. (2018). Interaktionen zwischen Sprache und Musik. In M. Sambanis & H. Böttger (Eds.), *Focus on Evidence II: Fremdsprachendidaktik trifft Neurowissenschaften* (pp. 81-96). Narr Francke Attempto.

Jentschke, S., & Kölsch, K. (2007). Sprach- und Musikverarbeitung bei Kindern: Einflüsse musikalischen Trainings. Geänderte und aktualisierte Fassung von „Einflüsse von Entwicklungsveränderungen auf die Musikwahrnehmung und die Beziehung von Musik und Sprache." In M. Fuchs (Ed.), *Singen und Lernen* (pp. 67–90). Logos-Verlag.

Jentschke, S., & Kölsch, S. (2009). Musical training modulates the development of syntax processing in children. *NeuroImage, 47*(2), 735–744. https://doi.org/10.1016/j.neuroimage.2009.04.090

Johnson, J. S., & Newport, E. L. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology, 21*(1), 60–99. https://doi.org/10.1016/0010-0285(89)90003-0

Jolly, Y. (1975). The use of songs in teaching foreign languages. *Modern Language Journal, 59*(1), 11–14. https://doi.org/10.1111/j.1540-4781.1975.tb03618.x

Jusczyk, P., Hirsh-Pasek, K., Kemler-Nelson, D., Kennedy, L., Woodward, A., & Piwoz, J. (1992). Perception of acoustic correlates of major phrasal units by young infants. *Cognitive Psychology, 24*(2), 252–293. https://doi.org/10.1016/0010-0285(92)90009-Q

Jusczyk, P. W., & Krumhansl, C. L. (1993). Pitch and rhythmic patterns affecting infants' sensitivity to musical phrase structure. *Journal of Experimental Psychology: Human Perception and Performance, 19*(3), 627–640. https://doi.org/10.1037/0096-1523.19.3.627

Justin, P., & Sloboda, J. (2001). Psychological perspectives on music and emotion. In P. Justin & J. Sloboda (Eds.), *Music and emotion: Theory and research* (pp. 71–104). Oxford University Press.

Kallinen, K. (2002). Reading news from a pocket computer in a distracting environment: Effects of the tempo of background music. *Computers in Human Behavior, 18*(5), 537–551. https://doi.org/10.1016/S0747-5632(02)00005-5

Kanel, K. (1997). Teaching with music: A comparison of conventional listening tasks with pop song gap-fill tasks. *JALT Journal, 19*(2), 217–234.

Kansaku, K., Yamaura, A., & Kitazawa, S. (2000). Sex differences in lateralization revealed in the posterior language areas. *Cerebral Cortex, 10*(9), 866–872. https://doi.org/10.1093/cercor/10.9.866

Kapa, L. L., & Colombo, J. (2013). Attentional control in early and later bilingual children. *Cognitive Development, 28*(3), 233–246. https://doi.org/10.1016/j.cogdev.2013.01.011

Kara, Z. E., & Aksel, A. S. (2013). The effectiveness of music in grammar teaching on the motivation and success of the students at preparatory school at Uludağ University. *Procedia – Social and Behavioral Sciences, 106*, 2739–2745. https://doi.org/10.1016/j.sbspro.2013.12.314

Karlina, H., Raja, P., & Suka, R. G. (2017). Teaching tense through modified song lyrics for junior high school. *Neliti.* https://media.neliti.com/media/publications/213694-teaching-tense-through-modified-song-lyr.pdf

Kaushanskaya, M., Marian, V., & Yoo, J. (2011). Gender differences in adult word learning. *Acta Psychologica, 137*(1), 24–35. https://doi.org/10.1016/j.actpsy.2011.02.002

Kaushanskaya, M., Gross, M., & Buac, M. (2013). Gender differences in child word learning. *Learning and Individual Differences, 27*, 82–89. https://doi.org/10.1016/j.lindif.2013.07.002

Keenan, J. P., Halpern, A. R., Thangaraj, V., Chen, C., Edelman, R. R., & Schlaug, G. (2001). Absolute pitch and planum temporale. *NeuroImage, 14*(6), 1402–1408. https://doi.org/10.1523/JNEUROSCI.3009-14.2015

Kellaris, J. J. (2001). Identifying properties of tunes that get 'stuck-in-your-head': Toward a theory of cognitive itch. In *Proceedings of the Society for Consumer Psychology Winter 2001 Conference* (pp. 66–67). Society for Consumer Psychology. https://doi.org/10.1348/000712609X479636

Kelly, L. G. (1969). *25 centuries of language teaching*. Newbury House Publishers.

Kelly, M. H., & Rubin, D. C. (1988). Natural rhythmic patterns in English verse: Evidence from child counting-out rhymes. *Journal of Memory and Language, 27*(6), 718–740. https://doi.org/10.1016/0749-596X(88)90017-4

Kern, R. (1994). The role of mental translation in second language reading. *Studies in Second Language Acquisition, 16*(4), 441–461. https://doi.org/10.1017/S0272263100013450

Kersten, S. (2010). *The mental lexicon and vocabulary learning: Implications for the foreign language classroom*. Narr Verlag.

Kersten, S. (2015). Language development in young learners: The role of formulaic language. In J. Bland (Ed.), *Teaching English to young learners: Critical issues in language teaching with 3–12 year olds* (pp. 129–145). Bloomsbury Academic.

Kieffer, M. J., & Lesaux, N. K. (2012). Knowledge of words, knowledge about words: Dimensions of vocabulary in first and second language learners in sixth grade. *Reading and Writing, 25*(2), 347–373. https://doi.org/10.1007/s11145-010-9272-9

Kilgour, A. R., Jakobson, L. S., & Cuddy, L. L. (2000). Music training and rate of presentation as mediators of text and song recall. *Memory & Cognition, 28*(5), 700–710. https://doi.org/10.3758/BF03198404
Kim, K. H. S., Relkin, N. R., Lee, K. M., & Hirsch, J. (1997). Distinct cortical areas associated with native and second languages. *Nature, 388*(6638), 171–174. https://doi.org/10.3758/BF03198404

Kircher, E., Girwidz, R., & Häußler, P. (2009). *Physikdidaktik: Theorie und Praxis.* Springer.

Kishon-Rabin, L., Amir, O., Vexler, Y., & Zaltz, Y. (2001). Pitch discrimination: Are professional musicians better than non-musicians? *Journal of Basic and Clinical Physiology and Pharmacology, 12*(2), 125–143. https://doi.org/10.1515/jbcpp.2001.12.2.125

Kleber, B., Veit, R., Birbaumer, N., Gruzelier, J., & Lotze, M. (2010). The brain of opera singers: Experience-dependent changes in functional activation. *Cerebral Cortex, 20*(5), 1144–1152. https://doi.org/10.1093/cercor/bhp177

Ko, S. J., Ford, J. D., Kassam-Adams, N., Berkowitz, S. J., Wilson, C., Wong, M., Brymer, M. J., & Layne, C. M. (2008). Creating trauma-informed systems: Child welfare, education, first responders, health care, juvenile justice. *Professional Psychology: Research and Practice, 39*(4), 396–404. https://doi.org/10.1037/0735-7028.39.4.396

Köksal, O., Yağışan, N., & Çekiç, A. (2013). The effects of music on achievement, attitude, and retention in primary school English lessons. *Procedia – Social and Behavioral Sciences, 93*, 1897–1900. https://doi.org/10.1016/j.sbspro.2013.10.136

Köller, O. (1998). *Zielorientierungen und schulisches Lernen*. Münster, Germany: Waxmann.

Köller, O., Baumert, J., Cortina, K. S., Trautwein, U., & Wagemann, R. (2004). Öffnung von Bildungswegen in der Sekundarstufe II und die Wahrung von Standards: Analysen am Beispiel der Englischleistungen von Oberstufenschülern an integrierten Gesamtschulen, beruflichen und allgemein bildenden Gymnasien. *Zeitschrift für Pädagogik, 50*(5), 679–700.

Kölsch, S., Schröger, E., & Tervaniemi, M. (1999). Superior pre-attentive auditory processing in musicians. *NeuroReport, 10*(6), 1309–1313. https://doi.org/10.1097/00001756-199904260-00029

Kölsch, S., Gunter, T., & Friederici, A. (2000). Brain indices of music processing: "Nonmusicians" are musical. *Journal of Cognitive Neuroscience, 12*(3), 520–541. https://doi.org/10.1162/089892900562183

Kölsch, S., Gunter, T. C., von Cramon, D. Y., Zysset, S., Lohmann, G., & Friederici, A. D. (2002). Bach speaks: A cortical 'language-network' serves the processing of music. *NeuroImage, 17*(2), 956–966. https://doi.org/10.1006/nimg.2002.1154

Kölsch, S., Grossmann, T., Gunter, T. C., Hahne, A., Schröder, E., & Friederici, A. D. (2003a). Children processing music: Electric brain responses reveal musical competence and gender differences. *Journal of Cognitive Neuroscience, 15*(5), 683–693. https://doi.org/10.1162/089892903322307401

Kölsch, S., Macs, B., Grossmann, T., & Friederici, A. D. (2003b). Electric brain responses reveal gender differences in music processing. *NeuroReport, 14*(5), 709–713. https://doi.org/10.1097/00001756-200304150-00010

Kölsch, S. T., Fritz, K., Schulze, K., & others. (2005). Adults and children processing music: An fMRI study. *NeuroImage, 25*(4), 1068–1076. https://doi.org/10.1016/j.neuroimage.2004.12.050

Kölsch, S., & Jentschke, S. (2008). Short-term effects of processing musical syntax: An ERP study. *Brain Research, 1212*, 55–62. https://doi.org/10.1016/j.brainres.2007.10.078

Kolb, B. (1999). Synaptic plasticity and the organization of behavior after early and late brain injury. *Canadian Journal of Experimental Psychology, 53*(1), 62–75. https://doi.org/10.1037/h0087300

Kraft, M. A. (2020). Interpreting effect sizes of education interventions. *Educational Researcher, 49*(4), 241–253. https://doi.org/10.3102/0013189X20912798

Krashen, S. (1981). *Second language acquisition and second language learning*. Pergamon Press.

Krashen, S. (1982). *Principles and Practice in Second Language Acquisition*. Pergamon Press Inc.

Krashen, S. D. (1983). The din in the head, input, and the language acquisition device. *Foreign Language Annals, 16*(1), 41–44. https://doi.org/10.1111/j.1944-9720.1983.tb01422.x

Krashen, S. D. (1985a). *The Input Hypothesis*. New York, Longman.

Krashen, S. D. (1985b). *Inquires & Insights*. Hayward, CA: Alemany Press.

Kraus, N., Skoe, E., Parbery-Clark, A., & Ashley, R. (2009). Experience-induced malleability in neural encoding of pitch, timbre, and timing. *Annals of the New York Academy of Sciences, 1169*(1), 543–557. https://doi.org/10.1111/j.1749-6632.2009.04549.x

Kraus, N., & Chandrasekaran, B. (2010). Music training for the development of auditory skills. *Nature Reviews Neuroscience, 11*(8), 599–605. https://doi.org/10.1038/nrn2882

Kreyer, R., & Mukherjee, J. (2007). The style of pop song lyrics: A corpus-linguistic pilot study. *Anglia: Zeitschrift für englische Philologie, 125*(1). https://doi.org/10.1515/ANGL.2007.31

Krishnamurthy, R. (2006). Collocations. In *Encyclopedia of Language & Linguistics* (2nd ed., Vol. 2, pp. 596–600). Elsevier.

Krüger, J. (2011). Doing things with music. *Phenomenology and the Cognitive Sciences, 10*(1), 1–22. https://doi.org/10.1007/s11097-010-9152-4

Krüger, J. (2014). Affordances and the musically extended mind. *Frontiers in Psychology, 4*, 1003–1015. https://doi.org/10.3389/fpsyg.2013.01003

Krumhansl, C. L., & Jusczyk, P. W. (1990). Infants' perception of phrase structure in music. *Psychological Science, 1*(1), 70–73. https://doi.org/10.1111/j.1467-9280.1990.tb00070.x

Kuhl, P. K. (2011). Early language acquisition: Cracking the speech code. *Nature Reviews Neuroscience, 12*(10), 723–735. https://doi.org/10.1038/nrn1533

Kunert, R., Willems, R. M., Casasanto, D., Patel, A. D., & Hagoort, P. (2015). Music and language syntax interact in Broca's area: An fMRI study. *PLoS ONE, 10*(11), e0141069. https://doi.org/10.1371/journal.pone.0141069

Kuppens, A. H. (2010). Incidental foreign language acquisition from media exposure. *Learning, Media and Technology, 35*(1), 65–85. https://doi.org/10.1080/17439880903561876

Kuśnierek, A. (2016). The role of music and songs in teaching English vocabulary to students. *World Scientific News, 43*(1), 1–55. https://scispace.com/pdf/the-role-of-music-and-songs-in-teaching-english-vocabulary-4igx1klbym.pdf

Kweon, S. O., & Kim, H. R. (2008). Beyond raw frequency: Incidental vocabulary acquisition in extensive reading. *Reading in a Foreign Language, 20*(2), 191–215. https://doi.org/10.64152/10125/66819

Lado, R., Baldwin, B., & Lobo, F. (1967). *Massive vocabulary in a foreign language beyond the basic course: The effects of stimuli, timing, and order of presentation.* Washington, DC: U.S. Department of Health, Education, and Welfare.

Lai, C., Zhu, W., & Gong, G. (2015). Understanding the quality of out-of-class English learning. *TESOL Quarterly, 49*(2), 278–308. https://www.jstor.org/stable/43893754

Lake, R. (2003). Enhancing acquisition through music. *The Journal of the Imagination in Language Learning and Teaching, 7*, 98–106.

Lamb, S. J., & Gregory, A. H. (1993). The relationship between music and reading in beginning readers. *Educational Psychology, 13*(1), 19–27. https://doi.org/10.1080/0144341930130103

Lane, H., Grosjean, F., Le Berre, J., & Lewin, E. (1973). Exploring some properties of foreign-language utterances that control their comprehension. *Linguistics, 112*, 15–22. https://doi.org/10.1515/ling.1973.11.112.15

Lappe, C., Herholz, S. C., Trainor, L. J., & Pantev, C. (2008). Cortical plasticity induced by short-term unimodal and multimodal musical training. *Journal of Neuroscience, 28*(39), 9632–9639. https://doi.org/10.1523/JNEUROSCI.2254-08.2008

Larsen-Freeman, D., & Long, M. H. (2000). *An introduction to second language acquisition research*. Shanghai: Shanghai Foreign Language Education Press.

Laufer, B. (1989). What percentage of text-lexis is essential for comprehension? In C. Lauren & M. Nordman (Eds.), *Special language: From humans thinking to thinking machines* (pp. 316–323). Clevedon: Multilingual Matters.

Laufer, B. (1997). The lexical plight in second language reading: Words you don't know, words you think you know, and words you can't guess. In J. Coady & T. Huckin (Eds.), *Second language vocabulary acquisition: A rationale for pedagogy* (pp. 20–34). Cambridge: Cambridge University Press.

Laufer, B. (1998). The development of passive and active vocabulary: Same or different? *Applied Linguistics, 19*(2), 255–271. https://doi.org/10.1093/applin/19.2.255

Laufer, B. (2003). Vocabulary acquisition in a second language: Do learners really acquire most vocabulary by reading? *Canadian Modern Language Review, 59*(4), 565–585. http://dx.doi.org/10.3138/cmlr.59.4.567

Laufer, B. (2005). Lexical frequency profiles: From Monte Carlo to the real world. A response to Meara (2005). *Applied Linguistics, 26*(4), 582–588. https://doi.org/10.1093/applin/ami029

Laufer, B. (2013). L2 vocabulary acquisition, knowledge and use. New perspectives on assessment and corpus analysis. *Eurosla Monographs Series, 2*. European Second Language Association. https://www.eurosla.org/monographs/EM02/TOC.pdf

Laufer, B. (2020). Lexical coverages, inferencing unknown words, and reading comprehension: How are they related? *TESOL Quarterly, 54*(4), 793–1157. https://doi.org/10.1002/tesq.3004

Laufer, B., & Shmueli, K. (1997). Assessing the effectiveness of monolingual, bilingual, and 'bilingualised' dictionaries in the comprehension and production of new words. *The Modern Language Journal, 81*(2), 189–196. https://doi.org/10.1111/j.1540-4781.1997.tb01174.x

Laufer, B., & Paribakht, T. S. (1998). The relationship between passive and active vocabularies: Effects of language learning context. *Language Learning, 48*(3), 365–391. https://doi.org/10.1111/0023-8333.00046

Laufer, B., & Nation, P. (1999). A vocabulary-size test of controlled productive ability. *Language Testing, 16*(1), 33–51. https://doi.org/10.1177/026553229901600103

Laufer, B., & Hulstijn, J. (2001). Incidental vocabulary acquisition in a second language: The construct of task-induced involvement. *Applied Linguistics, 22*(1), 1–26. https://doi.org/10.1093/applin/22.1.1

Laufer, B., & Goldstein, Z. (2004). Testing vocabulary knowledge: Size, strength, and computer adaptiveness. *Language Learning, 54*(3), 399–436. https://doi.org/10.1111/j.0023-8333.2004.00260.x

Laufer, B., & Rozovski-Roitblat, B. (2011). Incidental vocabulary acquisition: The effects of task type, word occurrence, and their combination. *Language Teaching Research, 15*(4), 391–411. https://doi.org/10.1177/1362168811412019

Lee, D. K. (2020). Data transformation: A focus on the interpretation. *Korean Journal of Anesthesiology, 73*(6), 503–508. https://doi.org/10.4097/kja.20137

Lee, D. J., Chen, Y., & Schlaug, G. (2003). Corpus callosum: Musician and gender effects. *NeuroReport, 14*(2), 205–209. https://doi.org/10.1097/00001756-200302100-00009

Lee, C.-Y., & Hung, T.-H. (2008). Identification of Mandarin tones by English-speaking musicians and nonmusicians. *Journal of the Acoustical Society of America, 124*(5), 3235. https://doi.org/10.1121/1.2990713

Legg, R. (2009). Using music to accelerate language learning: An experimental study. *Research in Education, 82*(1), 1–12. https://doi.org/10.7227/RIE.82.1

Leggieri, M., Thaut, M. H., Fornazzari, L., Schweizer, T., Barfett, J., Munoz, D. G., & Fischer, C. E. (2019). Music intervention approaches for Alzheimer's disease: A review of the literature. *Frontiers in Neuroscience, 13*, 132. https://doi.org/10.3389/fnins.2019.00132

Lems, K. (1996). For a song: Music across the ESL curriculum. Paper presented at the Annual Meeting of the Teachers of English to Speakers of Other Languages, Chicago, IL. *ERIC Document Reproduction Service No. ED396524.*

Lenneberg, R. S. (1967). *Biological foundations of language.* New York: John Wiley & Sons.

Leongómez, J. D., Havlíček, J., & Roberts, S. C. (2022). Musicality in human vocal communication: An evolutionary perspective. *Philosophical Transactions of the Royal Society B: Biological Sciences, 377*(1841), Article 20200391. https://doi.org/10.1098/rstb.2020.0391

Levene, H. (1960). Robust tests for equality of variances. In I. Olkin (Ed.), *Contributions to probability and statistics: Essays in honor of Harold Hotelling* (pp. 278–292). Stanford University Press.

Levitin, D. (2006). *This is your brain on music: Understanding a human obsession.* London: Atlantic.

Levitin, D. (2008). *This is your brain on music: Understanding a human obsession* (Kindle ed.). London: Atlantic Books.

Levitin, D. J. (2012). What does it mean to be musical? *Neuron, 73*(3), 633–637. https://doi.org/10.1016/j.neuron.2012.01.017

Levitin, D., & Menon, V. (2003). Musical structure is processed in "language" areas of the brain: A possible role for Brodmann Area 47 in temporal coherence. *NeuroImage, 20*(4), 2142–2152. https://doi.org/10.1016/j.neuroimage.2003.08.016

Levitzky-Aviad, T., & Laufer, B. (2013). Lexical properties in the writing of foreign language learners over eight years of study: Single words and collocations. In C. Bardel, C. Lindquist, & B. Laufer (Eds.), *L2 vocabulary acquisition, knowledge and use: New perspectives in assessment and corpus analysis* (pp. 127–150). European Second Language Association.

Lewis, M. (1993). *The Lexical Approach*. Hove: Language Teaching Publications.

Lewis, M. (1997). Pedagogical implications of the lexical approach. In J. Coady & T. Huckin (Eds.), *Second language vocabulary acquisition* (pp. 255–270). Cambridge: Cambridge University Press.

Lewis, M. (2000). *Teaching collocation.* Hove, UK: Language Teaching Publications.

Lewis, M. (2008). *The lexical approach: The state of ELT and a way forward.* Heinle.

Li, X., & Brand, M. (2009). Effectiveness of music on vocabulary acquisition, language usage, and meaning for mainland Chinese ESL learners. *Contributions to Music Education, 36*(1), 73–84. https://krpb.pbworks.com/f/music-esl.pdf

Li, M., & Kirby, J. R. (2015). The effects of vocabulary breadth and depth on English reading. *Applied Linguistics, 36*(5), 611–634. https://doi.org/10.1093/applin/amu007

Lieb, M. M. (2008). Music and listening: Learning gain without pain. In K. Bradford Watts, T. Muller, & M. Swanson (Eds.), *JALT2007 Conference Proceedings– Challenging assumptions: Looking in, looking out* (pp. 936-948).Tokyo: JALT. https://jalt-publications.org/archive/proceedings/2007/E022.pdf

Liegeois-Chauvel, C., Peretz, I., Babaie, M., Laguitton, V., & Chauvel, P. (1998). Contribution of different cortical areas in the temporal lobes to music processing. *Brain, 121*(9), 1853–1867. https://doi.org/10.1093/brain/121.10.1853

Lightbown, P. M., & Spada, N. (2013). *How languages are learned* (4th ed.). Oxford: Oxford University Press.

Liikkanen, L. A. (2012a). Inducing involuntary musical imagery: An experimental study. *Musicae Scientiae, 15*(2), 217–234. https://doi.org/10.1177/1029864912440770

Liikkanen, L. A. (2012b). Involuntary music among normal population and clinical cases. *Advances in Clinical Neuroscience and Rehabilitation, 12*(4), 12–14.

Liikkanen, L. A. (2012c). Musical activities predispose to involuntary musical imagery. *Psychology of Music, 40*(2), 236–256. https://doi.org/10.1177/0305735611406578

Limbong, R. (2012). Enriching students' vocabulary using English pop songs. *Journal of English Teaching, 2*(3), 223–237. https://doi.org/10.33541/jet.v2i3.58

Lindgren, E., & Muñoz, C. (2013). The influence of exposure, parents, and linguistic distance on young European learners' foreign language comprehension. *International Journal of Multilingualism, 10*(1), 105–129. https://doi.org/10.1080/14790718.2012.679275

Little, J. (1983). Pop and rock music in the ESL classroom. *TESL Talk, 14*(4), 40–44.

Liu, D. (2018). Literature review of the breadth and depth of vocabulary. *Journal of Language Teaching and Research, 9*(5), 1002–1008. https://doi.org/10.17507/jltr.0905.14

Livesey, L., Morrison, I., Clift, S., & Camic, P. (2012). Benefits of choral singing for social and mental wellbeing: Qualitative findings from a cross-national survey of choir members. *Journal of Public Mental Health, 11*(1), 10–26. https://psycnet.apa.org/doi/10.1108/17465721211207275

Lonsdale, C., Hodge, K., & Jackson, S. A. (2007). Athlete Engagement Questionnaire (AEQ) [Database record]. *APA PsycTests*. https://psycnet.apa.org/doi/10.1037/t50268-000

Lorenzo, O., Herrera, L., Hernández-Candelas, M., & Badea, M. (2014). Influence of music training on language development: A longitudinal study. *Procedia - Social and Behavioral Sciences, 128*, 527–530. https://doi.org/10.1016/j.sbspro.2014.03.200

Lorenzutti, N. (2014). Beyond the gap fill: Dynamic activities for songs in the EFL classroom. *English Teaching Forum, 52*(1), 14–21. https://www.researchgate.net/publication/374090874_Beyond_the_Gap_Fill_Dynamic_Activities_for_Song_in_the_EFL_Classroom

Lotze, M., Veit, R., Anders, S., & Borbaumer, N. (2007). Evidence for a different role of the ventral and dorsal medial prefrontal cortex for social reactive aggression: An interactive fMRI study. *NeuroImage, 34*(1), 470–478. https://doi.org/10.1016/j.neuroimage.2006.09.028

Loui, P., Kroog, K., Zuk, J., Winner, E., & Schlaug, G. (2011). Relating pitch awareness to phonemic awareness in children: Implications for tone-deafness and dyslexia. *Frontiers in Psychology, 2*(11). https://doi.org/10.3389/fpsyg.2011.00111

Lozanov, G. (1978). *Suggestology and outlines of suggestopedy* (Psychic studies). Gordon and Breach.

Luckner, A. (2007). Musik-Sprache-Rhythmus: Bemerkungen und Grundfragen der Musikphilosophie. In U. Tadday (Ed.), *Musikphilosophie. Sonderdruck aus Musik-Konzepte. Neue Folge. Sonderband* (pp. 34–49). München: Richard Boorberg Verlag.

Luders, E., Gaser, C., Jancke, L., & Schlaug, G. (2004). A voxel-based approach to gray-matter asymmetries. *NeuroImage, 22*(2), 656–664. https://doi.org/10.1016/j.neuroimage.2004.01.032

Luders, E., Narr, K., Thompson, P., Woods, R., Rex, D., Jancke, L., & Toga, A. (2005). Mapping cortical gray matter in the young adult brain: Effects of gender. *NeuroImage, 26*(2), 493–501. https://doi.org/10.1016/j.neuroimage.2005.02.010

Ludke, K. M. (2010). *Songs and singing in foreign language learning* (Unpublished doctoral dissertation). University of Edinburgh, Edinburgh, UK.

Ludke, K. M. (2018). Singing and arts activities in support of foreign language learning: An exploratory study. *Innovation in Language Learning and Teaching, 12*(4), 371–386. https://doi.org/10.1080/17501229.2016.1253700

Ludke, K. M., Ferreira, F., & Overy, K. (2014). Singing can facilitate foreign language learning. *Memory & Cognition, 42*(1), 41–52. https://doi.org/10.3758/s13421-013-0342-5

Ludke, K. M., & Good, A. (2020). Singing to support foreign language learning: Examples from two cultural and developmental contexts. In K. M. Ludke & A. Good (Eds.), *The Routledge Companion to Interdisciplinary Studies in Singing, Volume II: Education* (pp. 403-414). Routledge.

Lundberg, I. (2010). *Röst och rörelse* [Voice and movement]. Studentlitteratur AB.

Luo, S. (2019). Influence of singing English songs on vocabulary learning by senior school students in Guangzhou. *International Journal of Information and Education Technology, 9*(11), 843–848. https://doi.org/10.18178/ijiet.2019.9.11.1315

Lyczak, R. A. (1979). The effect of exposure to a language on subsequent learning. *Language and Speech, 22*(1), 81–88.

Ma, W., Bowers, L., Behrend, D., Hellmuth Margulis, E., & Forde Thompson, W. (2024). Child word learning in song and speech. *Quarterly Journal of Experimental Psychology, 77*(2), 343–362. https://doi.org/10.1177/17470218231172494

Macedonia, M. (2014). Bringing back the body into the mind: Gestures enhance word learning in a foreign language. *Frontiers in Psychology, 5*(1467). https://doi.org/10.3389/fpsyg.2014.01467

MacIntyre, P. D., & Gardner, R. C. (1991). Language anxiety: Its relationship to other anxieties and to processing in native and second languages. *Language Learning, 41*(4), 513–534. https://doi.org/10.1111/j.1467-1770.1991.tb00691.x

MacLachlan, S. (2009). *Memory for music and the implications of expertise for music recall: A review; Memory for the recall of popular songs: A comparative study of musicians and nonmusicians* (Honours thesis). Edith Cowan University.

Macmillan, F. (2013). Song and dance: The use of songs in language teaching. *ELT Journal, 67*(4), 457–465. https://doi.org/10.1155/2022/3384067

Magne, C., Schön, D., & Besson, M. (2006). Musician children detect pitch violations in both music and language better than nonmusician children: Behavioral and electrophysiological approaches. *Journal of Cognitive Neuroscience, 18*(2), 199–211. https://doi.org/10.1162/089892906775783660

Maier, W. (1995). *Fremdsprachen in der Grundschule: Eine Einführung in ihre Didaktik und Methodi*k (5. Auflage). Berlin/München: Langenscheidt.

Mannarelli, P., & Serrano, R. (2022). 'Thank you for the music': Examining how songs can promote vocabulary learning in an EFL class. *The Language Learning Journal.* https://doi.org/10.1080/09571736.2022.2092198

Marie, C., Delogu, F., Lampis, G., Belardinelli, M. O., & Besson, M. (2010). Influence of musical expertise on segmental and tonal processing in Mandarin Chinese. *Journal of Cognitive Neuroscience, 23*(10), 2701–2715. https://doi.org/10.1162/jocn.2010.21585

Marie, C., Magne, C., & Besson, M. (2011). Musicians and the metric structure of words. *Journal of Cognitive Neuroscience, 23*(2), 294–305. https://doi.org/10.1162/jocn.2010.21413

Marjanen, K. (2016). The European Music Portfolio: Music pedagogies as a support for language learning. *Hellenic Journal of Music, Education & Culture, 7*(1). http://hejmec.eu/journal/index.php/HeJMEC/article/viewFile/75/57

Marques, C., Moreno, S., Castro, S. L., & Besson, M. (2007). Musicians detect pitch violations in a foreign language better than nonmusicians: Behavioral and electrophysiological evidence. *Journal of Cognitive Neuroscience, 19*(9), 1453–1463. https://doi.org/10.1162/jocn.2007.19.9.1453

Marques, T. A., Thomas, L., Ward, J., DiMarzio, N., & Tyack, P. L. (2009). Estimating cetacean population density using fixed passive acoustic sensors: An example with Blainville's beaked whales. *The Journal of the Acoustical Society of America, 125*(4), 1982–1994. https://doi.org/10.1121/1.3089590

Martin, N., & Saffran, E. M. (1999). Effects of word processing and short-term memory deficits on verbal learning: Evidence from aphasia. *International Journal of Psychology, 34*(5-6), 339–346. https://doi.org/10.1080/002075999399666

Martínez-Montes, E., Hernández-Pérez, H., Chobert, J., Morgado-Rodríguez, L., Suárez-Murias, C., Valdés-Sosa, P. A., & Besson, M. (2013). Musical expertise and foreign speech perception. *Frontiers in Systems Neuroscience, 7*(84). https://doi.org/10.3389/fnsys.2013.00084

Mary, A. G. V. (2022). Effects of music on second language acquisition. *International Journal of Scientific & Engineering Research, 13*(5).

Marzano, R. J. (1998). *A theory-based meta-analysis of research on instruction.* Mid-continent Regional Educational Laboratory. https://www.viaeducacion.org/downloads/ap/ehd/meta_analysis_research.pdf

Marzano, R. J. (2003). *What works in schools: Translating research into action.* ASCD.

Masataka, N. (2007). Music, evolution, and language. *Developmental Science, 10*(1), 35–39. https://doi.org/10.1111/j.1467-7687.2007.00561.x

Masoura, E. V., & Gathercole, S. E. (1999). Phonological short-term memory and foreign language learning. *International Journal of Psychology, 34*(5–6), 383–388. https://doi.org/10.1080/002075999399738

Matthews, J. S., Ponitz, C. C., & Morrison, F. J. (2009). Early gender differences in self-regulation and academic achievement. *Journal of Educational Psychology, 101*(3), 689–704. https://doi.org/10.1037/a0014240

Maus, B., Kölsch, S., Gunter, T. C., & Friederici, A. D. (2001). Musical syntax is processed in Broca's area: An MEG study. *Nature Neuroscience, 4*(5), 540–545. https://doi.org/10.1038/87502

Maxwell, S. E., & Delaney, H. D. (2004). *Designing experiments and analyzing data: A model comparison perspective* (2nd ed.). Psychology Press.

May, P. (2006). Englisch Hörverstehen am Ende der Grundschulzeit. In W. Bos & M. Pietsch (Eds.), KESS 4- *Kompetenzen und Einstellungen von Schülerinnen und Schülern am Ende der Jahrgangsstufe 4 in Hamburger Grundschulen* (pp. 203–224). Münster, Germany: Waxmann.

May, W. V. (1985). Musical style preferences and aural discrimination skills of primary grade school children. *Journal of Research in Music Education, 33*(1), 7–22. https://doi.org/10.1093/acprof:oso/9780198530329.003.0007

Mayer, H. O. (2013). *Interview und schriftliche Befragung*. Oldenburg. https://doi.org/10.1524/9783486717624

McCarthy, M. (1990). *Vocabulary.* Oxford: Oxford University Press.

McCarthy, M., & McCarten, J. (2018). Now you're talking! Practising conversation in second language learning. In C. Jones (Ed.), *Practice in second language learning* (pp. 7–29). Cambridge: Cambridge University Press.

McCarthy, W. (1985). Promoting language development through music. *Academic Therapy, 21*(2), 237–242.
McChesney, R. (1985). Music in family and family-like settings. In J. Boswell (Ed.), *Proceedings of the National Conference of Music Educators on the Young Child and Music* (pp. 98-128). Reston, VA: National Association for Music Education.

McConchie, L., & Jensen, E. (2020). Teaching to incorporate strategies into your teaching that will engage all areas of the brain. *Educational Leadership, 77*(8), 60–65.

McElhinney, M., & Annett, J. M. (1996). Pattern of efficacy of a musical mnemonic on recall of familiar words over several presentations. *Perceptual and Motor Skills, 82*(2), 395–400. https://doi.org/10.2466/pms.1996.82.2.395

McElrea, H., & Standing, L. (1992). Fast music causes fast drinking. *Perceptual and Motor Skills, 75*(2), 362. https://doi.org/10.2466/pms.1992.75.2.362

McGlone, J. (1980). Sex differences in human brain asymmetry: A critical survey. *Behavioral and Brain Sciences, 3*(2), 215–263. https://doi.org/10.1017/S0140525X00004398
McGrath, I. (2002). *Materials evaluation and design for language teaching.* Edinburgh: Edinburgh University Press.

McMillan, D., & Chavis, D. (1986). Sense of community: A definition and theory. *Journal of Community Psychology, 14*(1), 6–23. http://dx.doi.org/10.1002/1520-6629(198601)14:1<6::AID-JCOP2290140103>3.0.CO;2-I

McMullen, E., & Saffran, J. R. (2004). Music and language: A developmental comparison. *Music Perception, 21*(3), 289–311. https://doi.org/10.1525/mp.2004.21.3.289

McQuillan, J., & Rodrigo, V. (1995). A reading din in the head: Evidence of involuntary mental rehearsal in second language readers. *Foreign Language Annals, 28*(3), 330–336.

Meara, P. (1995). The importance of an early emphasis on L2 vocabulary. *The Language Teacher, 19*(2), 8–11.

Meara, P., & Jones, G. (1987). Tests of vocabulary size in English as a foreign language. *Polyglot, 8*, Fiche 1.

Meara, P., Milton, R., & Pritchard, S. (1990). Vocabulary learning in a second language: Person, task, context, and strategies. *The Language Learning Journal, 2*(1).

Medienpädagogischer Forschungsverbund Südwest. (2023). *JIM-Studie 2023: Jugend, Information, (Multi-)Media – Basisuntersuchung zum Medienumgang 12- bis 19-Jähriger in Deutschland.* https://www.mpfs.de/studien/jim-studie/

Medina, S. L. (1990). *The effects of music upon second language vocabulary acquisition.* Paper presented at the Annual Meeting of the Teachers of English to Speakers of Other Languages (TESOL), San Francisco, CA, United States. https://eric.ed.gov/?id=ED352834

Medina, S. L. (1993). The effect of music on second language vocabulary acquisition. *National Network for Early Language Learning, 6*(3). https://files.eric.ed.gov/fulltext/ED352834.pdf

Medina, S. L. (2002). *Using music to enhance second language acquisition: From theory to practice.* In *Language, literacy, and academic development for English language learners.* Pearson Educational Publishing.

Medina, S. L. (2003). Acquiring vocabulary through story-songs. *MEXTESOL Journal, 26*(1). https://penamiller.com/mextesol/static/public/files/551f8b495c20105864028bfa5cdbb132.pdf

Meier, J. (2010). Stressreduziertes (Fremdsprachen-) Lernen. In G. Bell & R. Kupetz (Eds.), *Der Einsatz von Musik und die Entwicklung von Audio Literacy im Fremdsprachenunterricht: Fremdsprachendidaktik inhalts- und lernerorientiert.* Peter Lang.

Meier, J. (2019). *Stressreduziertes (Fremdsprachen-)Lernen: Band I. Mehr Freude und Erfolg beim Lernen. Eine empirische Untersuchung an verschiedenen Schularten in 16 Ländern Europas.* IBS.

Meier, J. (2020). Fehler beim Wortschatzlernen durch sinnvolle Sprachvermittlung und effiziente Aufzeichnung vermeiden. In H. Böttger & M. Sambanis (Hrsg.), *Focus on Evidence III: Fremdsprachendidaktik trifft Neurowissenschaften* (pp. 203–212). Narr Francke Attempto Verlag.

Melka, F. (1997). Receptive vs. productive aspects of vocabulary. In N. Schmitt & M. McCarthy (Eds.), *Vocabulary: Description, acquisition, and pedagogy* (pp. 84-102). Cambridge University Press.

Mendelsohn, A., Elkana, O., & Nelken, R. (2017). Learning to ignore: Acquired duration thresholds for fast rate tachistoscopic speech. *Frontiers in Psychology, 8*, Article 2264.

Merriam, A. (1964). *The anthropology of music.* Northwestern University Press.

Merrill, J., Sammler, D., Bangert, M., Goldman, D., Lohmann, G., Turner, R., & Friederici, A. D. (2012). Perception of words and pitch patterns in song and speech. *Frontiers in Psychology, 3*, Article 76. https://doi.org/10.3389/fpsyg.2012.00076

Messick, S. (1980). Test validity and the ethics of assessment. *American Psychologist, 35*, 1012–1027. https://doi.org/10.1037/0003-066X.35.11.1012
Messick, S. (1989). Validity. In R. L. Linn (Ed.), *Educational measurement* (3rd ed., pp. 13–103). Macmillan.

Meyer, L. B. (1956). *Emotion and meaning in music.* The University of Chicago Press.

Mezynski, K. (1983). Issues concerning the acquisition of knowledge: Effects of vocabulary training on reading comprehension. *Review of Educational Research, 53*(2), 253–279. https://doi.org/10.2307/1170386

Michalska, K. J., Kinzler, K. D., & Decety, J. (2013). Age-related sex differences in explicit measures of empathy do not predict brain responses across childhood and adolescence. *Developmental Cognitive Neuroscience, 3*, 22–32. https://doi.org/10.1016/j.dcn.2012.08.001

Miller, G. A. (1999). On knowing a word. *Annual Review of Psychology, 50*, 1–19. https://doi.org/10.1146/annurev.psych.50.1.1

Milovanov, R., Huotilainen, M., Välimäki, V., Esquef, P. A., & Tervaniemi, M. (2008). Musical aptitude and second language pronunciation skills in school-aged children: Neural and behavioral evidence. *Brain Research, 1194*, 81–89. https://doi.org/10.1016/j.brainres.2007.11.042

Milovanov, R., Pietilä, P., Tervaniemi, M., & Esquer, P. A. A. (2010). Foreign language pronunciation skills and musical aptitude: A study of Finnish adults with higher education. *Learning and Individual Differences, 20*, 56–60. https://doi.org/10.1016/j.lindif.2009.11.003

Ministerium für Schule und Bildung des Landes Nordrhein-Westfalen. (2005). *Schulgesetz für das Land Nordrhein-Westfalen (Schulgesetz NRW-SchulG)* (GV. NRW. S. 102). Zuletzt geändert durch Gesetz vom 23. Februar 2022 (GV. NRW. S. 250). https://bass.schul-welt.de/6043.htm#1-1p48

Ministerium für Schule und Bildung des Landes Nordrhein-Westfalen. (2012). Ausbildungs- und Prüfungsordnung Sekundarstufe I (APO-S I) [Ordinance for Secondary Schools, Level I]. https://bass.schul-welt.de/12691.htm

Ministerium für Schule und Weiterbildung des Landes Nordrhein-Westfalen. (2014a). *Das Schulwesen in Nordrhein-Westfalen aus quantitativer Sicht 2013/2014: Statistische Übersicht 386* (2nd ed.). Düsseldorf. https://www.bildungsbericht-ganztag.de/cms/upload/Berichte/Bericht_2014_einzeln/Literatur_und_Abkrzungen_BiGa_NRW_2014.pdf?utm_source=chatgpt.com

Ministerium für Schule und Weiterbildung des Landes Nordrhein-Westfalen. (2014i). *Das Schulwesen in Nordrhein-Westfalen aus quantitativer Sicht 2013/2014: Statistische Übersicht 386* [The school system in North Rhine-Westphalia from a quantitative perspective 2013/2014: Statistical overview 386] (2nd ed.). Düsseldorf: Ministerium für Schule und Weiterbildung des Landes Nordrhein-Westfalen. https://www.schulministerium.nrw/sites/default/files/documents/Quantita_2013.pdf

Ministerium für Schule und Weiterbildung des Landes Nordrhein-Westfalen (2015). *Förderung von Schülerinnen und Schülern bei besonderen Schwierigkeiten im Erlernen des Lesens und Rechtschreibens* (LRS). https://bass.schule.nrw/280.htm

Ministerium für Schule und Weiterbildung des Landes Nordrhein-Westfalen (2015). *Training and examination regulations for lower secondary level.* https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.schulentwicklung.nrw.de/referenzrahmen/rr_datei_download.php?dateiid=4431&ved=2ahUKEwirl4ze2a-NAxW09QIHHfKJBMgQFnoECDsQAQ&usg=AOvVaw3vjdhaQSRz7tyU-iSAtxpP

Ministers of Education and Cultural Affairs of Germany, Federal State of North Rhine-Westphalia. (2022). *Kernlehrplan für die Sekundarstufe I Gymnasium in Nordrhein-Westfalen* (1st ed., Heft 3417, 2019). https://www.schulentwicklung.nrw.de/lehrplaene/lehrplannavigator-s-i/gymnasium-aufsteigend-ab-2019-20/index.html

Ministers of Education and Cultural Affairs of Germany, Federal State of North Rhine-Westphalia. (2022). *Sek I Gesamtschule: Kernlehrplan für die Sekundarstufe I Gesamtschule/Sekundarschule in Nordrhein-Westfalen* (2nd ed., Heft 3102). https://www.schulentwicklung.nrw.de/lehrplaene/lehrplan/324/gesk_e_klp_2022_06_13.pdf

Ministry for Schools, Education, the State of North Rhine-Westphalia. (n.d.). *Korrektur von Klausuren English.* https://www.schulentwicklung.nrw.de/lehrplaene/upload/klp_SII/e/Korrektur_von_Klausuren_Englisch.pdf

Ministry for Schools, Education, the State of North Rhine-Westphalia. (n.d.). *ZP 10.* https://www.standardsicherung.schulministerium.nrw.de/cms/zentrale-pruefungen-10/uebersicht/uebersicht-zp-10.php

Ministry for Schools, Education, the State of North Rhine-Westphalia. (2003). *Standards assurance NRW: School development NRW, correction of written work in English (Sek. I).* https://bass.schule.nrw/12691.htm

Ministry of Education and Cultural Affairs of Germany, Federal State of North Rhine-Westphalia. (2023). *Curriculum for elementary and middle school.* https://www.schulministerium.nrw/schule-bildung/schulorganisation/richtlinien-und-lehrplaene

Ministry of Education of the State of North Rhine-Westphalia. (1991). Förderung von Schülerinnen und Schülern bei besonderen Schwierigkeiten im Erlernen des Lesens und Rechtschreibens (LRS). https://bass.schul-welt.de/280.htm

Ministry of Education of the State of North Rhine-Westphalia. (2024). Verordnung über die Ausbildung und die Abschlussprüfungen in der Sekundarstufe I (Ausbildungs- und Prüfungsordnung Sekundarstufe I - APO-S I). https://bass.schul-welt.de/12691.htm

Ministry of Education, Science, Youth and Culture of Rhineland-Palatinate. (2009). *Comprehensive school regulation.* https://bm.rlp.de/fileadmin/09/zum_Loeschen/Bildung/Service/Publikationen/Schule/Broschuere_Schulordnung_LAY_07102022.pdf

Miranda, D. (2013). The role of music in adolescent development: Much more than the same old song. *International Journal of Adolescence and Youth, 18*, 5–22. https://doi.org/10.1080/02673843.2011.650182

Miranda, R. A., & Ullman, M. T. (2007). Double dissociation between rules and memory in music: An event-related potential study. *NeuroImage, 38*, 331–345. https://doi.org/10.1016/j.neuroimage.2007.07.034

Mishan, F. (2005). *Designing authenticity into language learning materials.* Intellect.

Mishra, P., Singh, U., Pandey, C. M., Mishra, P., & Pandey, G. (2019). Application of student's t-test, analysis of variance, and covariance. *Annals of Cardiac Anaesthesia, 22*(4), 407–411. https://doi.org/10.4103/aca.ACA_94_19

Mithen, S. (2005). *The singing Neanderthals: The origins of music, language, mind and body*. Weidenfeld & Nicolson.

Monreal, M. E. (1982). How I use songs. *English Teaching Forum, 20*(3), 44–45.

Montgomery, M. M. (2019). Speaking rates and their effect on second language learning. *TESOL Quarterly, 53*(1), 140–148.

Moosbrugger, S. A. (2025). *U.S. high school German teachers' experiences using music in the classroom* (Unpublished doctoral dissertation or master's thesis). Capella University.

Moradzadeh, L., Blumenthal, G., & Wiehert, M. (2015). Musical training, bilingualism, and executive function: A closer look at task switching and dual-task performance. *Cognitive Science, 19*(5), 992–1020. https://doi.org/10.1111/cogs.12183

Moreno, R., Mayer, R. E., Spires, H. A., & Lester, J. C. (2001). The case for social agency in computer-based teaching: Do students learn more deeply when they interact with animated pedagogical agents? *Cognition and Instruction, 19*(2), 177–213. https://doi.org/10.1207/S1532690XCI1902_02

Moreno, S., & Besson, M. (2006). Musical training and language-related brain electrical activity in children. *Psychophysiology, 43*, 287–291. https://doi.org/10.1111/j.1469-8986.2006.00401.x

Moreno, S., Marques, C., Santos, A., Santos, M., Castro, S. L., & Besson, M. (2009). Musical training influences linguistic abilities in 8-year-old children: More evidence for brain plasticity. *Cerebral Cortex, 19*(3), 712–723. https://doi.org/10.1093/cercor/bhn120

Moreno, S., Friesen, D., & Bialystok, E. (2011). Effect of music training on promoting preliteracy skills: Preliminary causal evidence. *Music Perception, 29*(2), 165–172. https://doi.org/10.1525/mp.2011.29.2.165

Moritz, C., Yampolsky, S., Papadelis, G., Thomson, J., & Wolf, M. (2013). Links between early rhythm skills, musical training, and phonological awareness. *Reading and Writing, 26*, 739–769. https://doi.org/10.1007/s11145-012-9389-0

Morris, C. D., Bransford, J. D., & Franks, J. J. (1977). Levels of processing versus transfer appropriate processing. *Journal of Verbal Learning and Verbal Behavior, 16*(5), 519–533. https://doi.org/10.1016/S0022-5371(77)80016-9

Morrongiello, B. A., & Roes, C. L. (1990). Children's memory for new songs: Integration or independent storage of words and tunes? *Journal of Experimental Child Psychology, 50*, 29–41. https://doi.org/10.1016/0022-0965(90)90030-C

Moufarrej, G., & Salameh, C. (2019). The effects of songs on vocabulary retention in foreign language acquisition: The case of Arabic. *Al-ʿArabiyya, 52*, 101–177.

Mousavi, S. A. (2002). *An encyclopedic dictionary of language testing* (3rd ed.). Tung Hua Book Company.

Müllensiefen, D., Fry, J., Jones, R., Jilka, S., Stewart, L., & Williamson, V. J. (2014). Individual differences predict patterns in spontaneous involuntary musical imagery. *Music Perception, 31*(4), 323–338. https://doi.org/10.1525/mp.2014.31.4.323

Müller, K. D., Koscik, R. L., Turkstra, L. S., Riedeman, S., LaRue, A., Clark, L. R., Hermann, B., Sager, M. A., & Johnson, S. C. (2016). Connected language in late middle-aged adults at risk for Alzheimer's disease. *Journal of Alzheimer's Disease, 54*(4), 1539–1550. https://doi.org/10.3233/JAD-160252

Mullis, V. S. A., Martin, O. M., Kennedy, A. M., & Foy, P. (2007). *Progress in international reading literacy study in primary school in 40 countries*. TIMSS & PIRLS International Study Center, Boston College.

Muñoz, C. (2020). Boys like games and girls like movies. *Revista Española de Lingüística Aplicada / Spanish Journal of Applied Linguistics*, 33(1), 171–201. https://doi.org/10.1075/resla.18042.mun

Murphey, T. (1987). *English through singing, TPR, walking labs, and music matter.* Paper presented at the annual meeting of the International Association of Teachers of English as a Foreign Language, Westende, Belgium, April 12–14. (ERIC Document Reproduction No. ED 287 292). https://files.eric.ed.gov/fulltext/ED287292.pdf

Murphey, T. (1989). The when, where, and who of pop lyrics: The listener's prerogative. *Popular Music, 8*(2), 185–193. https://www.jstor.org/stable/853468

Murphey, T. (1990a). *Song and music in language learning: An analysis of pop song lyrics and the use of song and music in teaching English as a foreign language.* Peter Lang.

Murphey, T. (1990b). The song stuck in my head phenomenon: A melodic did in the lad? *System, 18*(1), 53–64. https://doi.org/10.1016/0346-251X(90)90028-4

Murphey, T. (1992). The discourse of pop songs. *TESOL Quarterly, 26*(4), 770–774. https://doi.org/10.2307/3586887

Murphey, T., & Alber, J. (1985). A pop song register: The motherese of adolescents as affective foreigner talk. *TESOL Quarterly, 19*(4), 793–795. https://doi.org/10.2307/3586679

Musacchia, G., Strait, D., & Kraus, N. (2008). Relationships between behavior, brainstem, and cortical encoding of seen and heard speech in musicians and non-musicians. *Hearing Research, 241*, 34–42. https://doi.org/10.1016/j.heares.2008.04.013

Myles, F., Mitchell, R., & Hooper, J. (1999). Interrogative chunks in French L2: A basis for creative construction? *Studies in Second Language Acquisition, 21*(1), 49–80. https://www.jstor.org/stable/44486416

Nadler, R., Rabi, R., & Minda, J. P. (2010). Better mood and better performance: Learning rule-described categories is enhanced by positive mood. *Psychological Science, 21*(12), 1770–1776. https://doi.org/10.1177/0956797610387441

Nagy, W. E., Herman, P. A., & Anderson, P. C. (1985). Learning words from context. *Reading Research Quarterly, 20*(2), 233–253. https://doi.org/10.2307/747758

Nambiar, M. (1993). Pop songs in language teaching. In J. W. Oller Jr. (Ed.), *Methods that work: Ideas for literacy and language teaching* (2nd ed., pp. 335–338). Boston, MA: Heinle & Heinle Publishers.

Nassaji, H., & Fotos, S. (2011). *Teaching grammar in second language classrooms: Integrating form-focused instruction in communicative context.* New York, NY: Routledge.

Nation, I. S. P. (1990). *Teaching and learning vocabulary*. Boston, MA: Heinle & Heinle.

Nation, I. S. P. (2001). *Learning vocabulary in another language.* Cambridge, UK: Cambridge University Press/Klett.

Nation, I. S. P. (2004). A study of the most frequent word families in the British National Corpus. In P. Bogaards & B. Laufer (Eds.), *Vocabulary in a second language: Selection, acquisition, and testing* (pp. 3–13). Amsterdam, The Netherlands/Philadelphia, PA: John Benjamins Publishing Company.

Nation, I. S. P. (2006). How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review, 63*(1), 59–82. https://www.lextutor.ca/cover/papers/nation_2006.pdf

Nation, I. S. P. (2007). *The four strands. International Journal of Innovation in Language Learning and Teaching, 1*(1), 2–23. https://doi.org/10.2167/illt039.0

Nation, I. S. P. (2008). *Teaching ESL/EFL reading and writing*. Routledge.

Nation, I. S. P. (2009). New roles for L2 vocabulary? In W. Li & V. J. Cook (Eds.), *Contemporary applied linguistics: Volume 1: Language teaching and learning* (pp. 99–116). London, UK: Continuum.

Nation, I. S. P. (2012). *Introduction: Teaching vocabulary*. Heinle ELT.

Nation, I. S. P. (2013a). *What are the ten most effective vocabulary activities?* Presented at the JALT College and University Educators Special Interest Group Event, Sapporo, Japan.

Nation, I. S. P. (2013b). *Learning vocabulary in another language* (2nd ed.). Cambridge, UK: Cambridge University Press.

Nation, I. S. P. (2014). How much input do you need to learn the most frequent 9,000 words? *Reading in a Foreign Language, 26*(2), 1–16. https://files.eric.ed.gov/fulltext/EJ1044345.pdf

Nation, I. S. P. (2016). *Making and using word lists for language learning and testing.* Amsterdam, The Netherlands: John Benjamins Publishing Company.

Nation, I. S. P. (2017). The BNC/COCA Level 6 word family lists (Version 1.0.0) [Data file]. https://www.wgtn.ac.nz/lals/about/staff/paul

Nation, I. S. P. (2020). The different aspects of vocabulary knowledge. In S. Webb (Ed.), *The Routledge handbook of vocabulary studies* (pp. 15–29). Routledge.
Nation, I. S. P., & Wang, K. (1999). Graded readers and vocabulary. *Reading in a Foreign Language, 12*(2), 355–380. https://www.wgtn.ac.nz/lals/resources/paul-nations-resources/paul-nations-publications/publications/documents/1999-Wang-Graded-readers.pdf

Nation, I. S. P., & Deweerdt, J. (2001). A defence of simplification. *Prospect, 16*(3), 55–67.

Nation, I. S. P., & Beglar, D. (2007). A vocabulary size test. *The Language Teacher, 31*(7), 9–13. http://www.jalt-publications.org/archive/tlt/2007/07_2007TLT.pdf

Nation, I. S. P., & Webb, S. (2011). *Researching and analyzing vocabulary.* Andover, UK: Cengage Learning.

Nattinger, J. R. (1980). A lexical phrase grammar for ESL. *TESOL Quarterly, 14*(3), 337–344.

Nattinger, J. R., & DeCarrico, J. S. (1992). *Lexical phrases and language learning.* Oxford, UK: Oxford University Press.

Nelson, J. (1989). *A surprise for Benjamin Bear.* Modern Curriculum Press.

Newton, J. (2013). Incidental vocabulary learning in classroom communication tasks. *Language Teaching Research, 17*(2), 164–187. https://doi.org/10.1177/1362168812460814

Nigua, K. (2021). Top 20 best pop singers of 21st century. *MusicRaiser.* https://www.musicraiser.com/best-pop-singers-21st-century/

Nipattamanon, J. (2018). Utilizing English pop songs with karaoke application among young adults to enhance connected speech production. *The New English Teacher, 12*(2), 15. https://assumptionjournal.au.edu/index.php/newEnglishTeacher/article/view/2959/2122

Nitsch, C. (2007). Mehrsprachigkeit: Eine neurowissenschaftliche Perspektive. In T. Anstatt (Ed.), *Mehrsprachigkeit bei Kindern und Erwachsenen: Erwerb, Formen, Förderung* (pp. 47–68). Tübingen, Germany: Attempto.

Nittono, I. S. P. (1983). Testing and teaching vocabulary. *Guidelines, 5*(1), 12–25.

Nittono, H., Tsuda, A., Akai, S., & Nakajima, Y. (2000). Tempo of background sound and performance speed. *Perceptual and Motor Skills, 90*(3, Pt. 2). https://doi.org/10.2466/PMS.90.3.1122-1122

Noymer, A. (2008). Alpha, significance level of test. In P. J. Lavrakas (Ed.), *Encyclopedia of survey research methods: A–M.* Sage. https://doi.org/10.4135/9781412963947.n13

Nunan, D. (1989). *Designing tasks for the communicative classroom.* Cambridge, UK: Cambridge University Press.

Nunan, D. (1991). *Language teaching methodology: A textbook for teachers.* Upper Saddle River, NJ: Prentice Hall.

Nurweni, A., & Read, J. (1999). The English vocabulary knowledge of Indonesian university students. *English for Specific Purposes, 18*(2), 161–175. https://doi.org/10.1016/S0889-4906(98)00005-2

O'Hanlon, J. F. (1981). Boredom: Practical consequences and a theory. *Acta Psychologica, 49*, 53–82. https://doi.org/10.1016/0001-6918(81)90033-0

Öchslin, M. S., Imfeld, A., Loenneker, T., Meyer, M., & Jäncke, L. (2009). The plasticity of the superior longitudinal fasciculus as a function of musical expertise: A diffusion tensor imaging study. *Frontiers in Human Neuroscience, 3*(76). https://doi.org/10.3389/neuro.09.076.2009

Ölkers, J. (2001). *Leistungsbeurteilung als Problem und Chance der Schulentwicklung.* Vortrag anlässlich der Fortbildungstagung des Freien Gymnasiums Zürich in der Kartause Ittigen am 30. April 2001. https://web.archive.org/web/20210922151823/https://www.phil-fak.uni-duesseldorf.de/fileadmin/Redaktion/Institute/Sozialwissenschaften/BF/Lehre/WiSe13_14/Reformpaedagogik/oelkers-leistungsbeurteilung_neu.pdf

Öztürk, M. (2017). Vocabulary load of English song lyrics for EFL learners. *Journal of Foreign Education and Technology, 2*(2), 54–73. https://scispace.com/pdf/vocabulary-load-of-english-song-lyrics-for-efl-learners-4ebey4i79t.pdf

Oksaar, E. M. (2018). *Multilingualism in the English-speaking world*. Routledge.

Oller, J. W., Jr. (1979). *Language tests at school: A pragmatic approach*. Longman.

Olsson, E., & Sylvén, L. (2015). Extramural English and academic vocabulary: A longitudinal study of CLIL and non-CLIL students in Sweden. *Journal of Applied Language Studies, 9*(2), 77–103. https://doi.org/10.17011/apples/urn.201512234129

Orlova, N. F. (2003). Helping prospective EFL teachers learn how to use songs in the conversation classroom. *Internet TESL Journal, 9*(3).

Overmann, M. (2005). *Emotionales, transnationales, hyper-, tele- und multimediales Fremdsprachenlernen*. Lang.

Overy, K., Nicolson, R. I., Fawcett, A. J., & Clarke, E. F. (2003). Dyslexia and music: Measuring musical timing skills. *Dyslexia, 9*, 18–36. https://doi.org/10.1002/dys.233

Overy, K., & Molnar-Szakacs, I. (2009). Being together in time: Musical experience and the mirror neuron system. *Music Perception: An Interdisciplinary Journal, 26*(5), 489–504. http://www.jstor.org/stable/10.1525/mp.2009.26.5.489

Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Newbury House.

Oxford, R. L. (2016). *Teaching and researching language learning strategies*. Routledge.

Oxford University Press. (1980s/1990s). *British National Corpus*. http://www.natcorp.ox.ac.uk/

Ozdemir, E., Norton, A., & Schlaug, G. (2006). Shared and distinct neural correlates of singing and speaking. *NeuroImage, 33*, 628–635. https://doi.org/10.1016/j.neuroimage.2006.07.013

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*(4), 543–578. https://doi.org/10.3102/00346543066004543

Pakkenberg, H., & Voigt, J. (1964). Brain weight of the Danes. *Cells Tissues Organs, 56*(4), 297–307. https://doi.org/10.1159/000145754

Palermo, D. (1978). *The psychology of language*. Scott, Foresman and Company.
Palmer, C. (1997). Music performance. *Annual Review of Psychology, 48*, 115–138. https://doi.org/10.1146/annurev.psych.48.1.115

Pantev, C., Oostenveld, R., Engelien, A., Ross, B., Roberts, L. E., & Hoke, M. (1998). Increased auditory cortical representation in musicians. *Nature, 392*, 811–814. https://doi.org/10.1038/33918

Pantev, C., Roberts, L. E., Schulz, M., Engelien, A., & Ross, B. (2001). Timbre-specific enhancement of auditory cortical representations in musicians. *Neuroreport, 12*(1), 169–174. https://doi.org/10.1097/00001756-200101220-00041

Pantev, C., Hidehiko, O., & Teismann, H. (2012). Music-induced cortical plasticity and lateral inhibition in the human auditory cortex as foundations for tonal tinnitus treatment. *Frontiers in Systems Neuroscience, 6*, 50. DOI: 10.3389/fnsys.2012.00050

Papagno, C., Valentine, T., & Baddeley, A. (1991). Phonological short-term memory and foreign-language vocabulary learning. *Journal of Memory and Language, 30*(3), 331–347. https://doi.org/10.1016/0749-596X(91)90040-Q
Papagno, C., & Vallar, G. (1992). Phonological short-term memory and the learning of novel words: The effects of phonological similarity and item length. *Quarterly Journal of Experimental Psychology, 44A*, 44–67. https://doi.org/10.1080/14640749208401283

Papantoni, A., & Anastasiadou, A. (2023). Enriching vocabulary via songs and poems in teaching English as a foreign language. *Research Papers in Language Teaching and Learning, 13*(1), 157–172. https://rpltl.eap.gr/images/2023/09_Papantoni__Anastasiadou.pdf

Papousek, H. (1996). Musicality in infancy research. In J. Sloboda & I. Deliege (Eds.), *Musical beginnings*. Oxford University Press.

Paquette, K. R., & Rieg, S. A. (2008). Using music to support the literacy development of young English language learners. *Early Childhood Education Journal, 36*(3), 227-232. https://doi.org/10.1007/s10643-008-0277-9

Parbery-Clark, A., Skoe, E., & Kraus, N. (2009). Musical experience limits the degradative effects of background noise on the neural processing of sound. *Journal of Neuroscience, 29*, 14100–14107. https://doi.org/10.1523/JNEUROSCI.3256-09.2009

Paribakht, T. S., & Wesche, M. B. (1993). Reading comprehension and second language development in a comprehension-based ESL program. *TESL Canada Journal, 11*(1), 9–29. https://doi.org/10.18806/tesl.v11i1.623

Parr, P. C., & Krashen, S. D. (1986). Involuntary rehearsal of second language in beginning and advanced performance. *System, 14*(3), 275–278. https://sdkrashen.com/content/articles/1986_parr_krashen_din.pdf

Parrott, M. (2000). *Grammar for English language teachers*. Cambridge University Press.

Passiatore, Y., Pirchio, S., Oliva, C., Panno, A., & Carrus, G. (2019). Self-efficacy and anxiety in learning English as a foreign language: Singing in class helps speaking performance. *ECPS – Educational, Cultural and Psychological Studies, 20*, 121–138. https://doi.org/10.7358/ecps-2019-020-passi

Patel, A. D. (2003). Language, music, syntax and the brain. *Nature Neuroscience, 6*(7), 674–681. https://doi.org/10.1038/nn1082

Patel, A. D. (2008). *Music, language, and the brain*. Oxford University Press.

Patel, A. D. (2011). Why would musical training benefit the neural encoding of speech? The OPERA hypothesis. *Frontiers in Psychology, 2*(142). https://doi.org/10.3389/fpsyg.2011.00142

Patel, A. D. (2012). The OPERA hypothesis: Assumptions and clarifications. *Annals of the New York Academy of Sciences, 1252*, 124–128. https://doi.org/10.1111/j.1749-6632.2011.06426.x

Patel, A. D. (2014). Can nonlinguistic musical training change the way the brain processes speech? The expanded OPERA hypothesis. *Hearing Research, 308*, 98–108. https://doi.org/10.1016/j.heares.2013.08.011

Patel, H. C., Price, J. C., Baron, et al. (1997). The structural components of music perception: A functional anatomical study. *Brain, 120*, 229–243. https://doi.org/10.1093/brain/120.2.229

Patel, A., Edward, G., Ratner, J., Besson, M., & Holcomb, P. (1998). Processing syntactic relations in language and music: An event-related potential study. *Journal of Cognitive Neuroscience, 10*(6), 717–733. https://doi.org/10.1162/089892998563121

Patel, A. D., & Balaban, E. (2001). Human pitch perception is reflected in the timing of stimulus-related cortical activity. *Nature Neuroscience, 4*, 839–844. https://doi.org/10.1038/90557

Patel, A. D., & Daniele, J. R. (2003). An empirical comparison of rhythm in language and music. *Cognition, 87*(1), B35–B45. https://doi.org/10.1016/S0010-0277(02)00187-7

Patel, A. D., & Iversen, J. R. (2007). The linguistic benefits of musical abilities. *Trends in Cognitive Sciences, 11*, 369–372. https://doi.org/10.1016/j.tics.2007.08.003

Patel, A. D., Iversen, J. R., Wassenaar, M., & Hagoort, P. (2008). Musical syntactic processing in agrammatic Broca's aphasia. *Aphasiology, 22*, 776–789. https://doi.org/10.1080/02687030701803804

Pavia, N., Webb, S., & Faez, F. (2019). Incidental vocabulary learning through listening to songs. *Studies in Second Language Acquisition, 41*(4), 745–768. https://doi.org/10.1017/S0272263119000020

Pawley, A., & Syder, F. H. (1983). Two puzzles for linguistic theory: Nativelike selection and nativelike fluency. In J. C. Richards & R. W. Schmidt (Eds.), *Language and communication* (pp. 191–227). Longman.

Pelham, B. W., & Blanton, H. (2013). *Conducting research in psychology: Measuring the weight of smoke* (4th ed.). Wadsworth, Cengage Learning.

Pelletier, C. L. (2004). The effect of music on decreasing arousal due to stress: A meta-analysis. *Journal of Music Therapy, 41*, 192–214. https://doi.org/10.1093/jmt/41.3.192

Pellicer-Sánchez, A. (2016). Incidental L2 vocabulary acquisition from and while reading: An eye-tracking study. *Studies in Second Language Acquisition, 38*(1), 97–130. https://doi.org/10.1017/S0272263115000224

Pellicer-Sánchez, A., & Schmitt, N. (2010). Incidental vocabulary acquisition from an authentic novel: Do things fall apart? *Reading in a Foreign Language, 22*(1), 97–130. https://doi.org/10.64152/10125/66652

Penfield, W., & Roberts, L. (1959). *Speech and brain mechanisms*. Princeton University Press.

Penno, J. F., Wilkinson, I. A. G., & Moore, D. W. (2002). Vocabulary acquisition from teacher explanation and repeated listening to stories: Do they overcome the Matthew effect? *Journal of Educational Psychology, 94*, 23–33. https://doi.org/10.1037/0022-0663.94.1.23

Peretz, I. (1993). Auditory amusia for melodies. *Cognitive Neuropsychology, 10*(1), 21–56. https://doi.org/10.1080/02643299308253455

Peretz, I., Kolinsky, R., Tramo, M., & Labrecque, R. (1994). Functional dissociations following bilateral lesions of auditory cortex. *Brain, 117*, 1283–1301. https://doi.org/10.1093/brain/117.6.1283

Peretz, I., Babaï, M., Lussier, I., Hébert, S., & Gagnon, L. (1995). Corpus of musical excerpts: Indices relating to familiarity, age of acquisition, and verbal evocations. *Canadian Journal of Experimental Psychology, 49*, 211–239. https://doi.org/10.1037/1196-1961.49.2.211

Peretz, I., & Zatorre, R. J. (2005). Brain organization for music processing. *Annual Review of Psychology, 56*, 89–114. https://doi.org/10.1146/annurev.psych.56.091103.070225

Peretz, I., Vuvan, D., Lagrois, M. E., & Armony, J. L. (2015). Neural overlap in processing music and speech. *Philosophical Transactions of the Royal Society B: Biological Sciences, 370*, 20140090. https://doi.org/10.1098/rstb.2014.0090

Peters, A. M. (1983). *The Units of Language Acquisition*. Cambridge: Cambridge University Press.

Peters, E. (2018). The effect of out-of-class exposure to English language media on learners' vocabulary knowledge. *International Journal of Applied Linguistics, 169*(1), 142–168. https://doi.org/10.1075/itl.00010.pet

Peters, E., Heynen, E., & Puimège, E. (2016). Learning vocabulary through audio-visual input: The differential effect of L1 subtitles and captions. *System, 63*, 134–148. https://doi.org/10.1016/j.system.2016.10.002

Peters, M. (1991). Sex differences in human brain size and the general meaning of differences in brain size. *Canadian Journal of Psychology, 45*, 507–522. https://doi.org/10.1037/h0084307

Phase-6 GmbH. (n.d.). *Lehrerbereich: Informationen für Lehrkräfte*. https://www.phase-6.de/classic/service/user/teacher/education.html

Piantadosi, S. T. (2014). Zipf's word frequency law in natural language: A critical review and future directions. *Psychonomic Bulletin & Review, 21*(5), 1112–1130. https://doi.org/10.3758/s13423-014-0585-6

Piccirilli, M., Sciarma, T., & Luzzi, S. (2000). Modularity of music: Evidence from a case of pure amusia. *Journal of Neurology, Neurosurgery, and Psychiatry, 69*, 541–545. https://doi.org/10.1136/jnnp.69.4.541

Picton, T. W., Alain, C., Otten, L., Ritter, W., & Achim, A. (2000). Mismatch negativity: Different water in the same river. *Audiology and Neurotology, 5*(3-4), 111–139. https://doi.org/10.1159/000013875

Pigada, M., & Schmitt, N. (2006). Vocabulary acquisition from extensive reading: A case study. *Reading in a Foreign Language, 18*(1), 1–28. https://doi.org/10.64152/10125/66611

Plass, J. L. (Ed.). (2010). Individual differences and cognitive load theory. In J. L. Plass, R. Moreno, & R. Brünken (Eds.), *Cognitive load theory* (pp. 65–87). Cambridge University Press. https://doi.org/10.1017/CBO9780511844744.006

Plass, J.L., Moreno, R., & Brünken, R. (2012). *Cognitive Load Theory*. Cambridge University Press.

Poarch, G. J., & Bialystok, E. (2015). Bilingualism as a model for multitasking. *Developmental Review, 35*, 113–124. https://doi.org/10.1016/j.dr.2014.12.003

Pöppel, D., Idsardi, W. J., & van Wassenhove, V. (2008). Speech perception at the interface of neurobiology and linguistics. *Philosophical Transactions of the Royal Society B: Biological Sciences, 363*, 1071–1086. https://doi.org/10.1098/rstb.2007.2160

Pogarell, O., Koch, W., Pöpperl, G., Tatsch, K., Jakob, F., Zwanzger, P., Mulert, C., Rupprecht, R., Möller, H. J., Hegerl, U., & Padberg, F. (2006). Striatal dopamine release after prefrontal repetitive transcranial magnetic stimulation in major depression: Preliminary results of a dynamic [123I] IBZM SPECT study. *Journal of Psychiatric Research, 40*(4), 307–314. https://doi.org/10.1016/j.jpsychires.2005.09.001

Pogarell, O., Koch, W., Pöpperl, G., Tasch, K., Jakob, F., Mulert, C., Grossheinrich, N., Rupprecht, R., Möller, H. J., Hegerl, U., & Padberg, F. (2007). Acute prefrontal rTMS increases striatal dopamine to a similar degree as D-amphetamine. *Psychiatry Research, 155*(3), 251–255. https://doi.org/10.1016/j.pscychresns.2007.05.002

Polley, D. B., Steinberg, E. E., & Merzenich, M. M. (2006). Perceptual learning directs auditory cortical map reorganization through top-down influences. *Journal of Neuroscience, 26*, 4970–4982. https://doi.org/10.1523/JNEUROSCI.3771-05.2006

Porst, R. (2014). *Fragebogen: Ein Arbeitsbuch* (4th ed.). Springer VS.

Prasser, G. (1983). Die Problematik der Notengebung in der Schule: Praxiserfahrungen eines Schulleiters. *Lehren und Lernen, 9*(8), 9–16.

Purcell, J. M. (1992). Using songs to enrich the secondary class. *Hispania, 75*(1), 192–196.

Purnell-Webb, P., & Speelman, C. P. (2008). Effects of music on memory for text. *Perceptual and Motor Skills, 106*(3), 927–957. https://doi.org/10.2466/PMS.106.3.927-957

Qian, D. D. (2002). Investigating the relationship between vocabulary knowledge and academic reading performance: An assessment perspective. *Language Learning, 52*, 513–536. https://doi.org/10.1111/1467-9922.00193

Quast, U. (1994). Music connects minds and hearts: Reflexionen zur Rolle und Verwendung von Musik im Fremdsprachenunterricht. *fsu, 38*(47), 169–171.

Quinn, G. (1968). *The English vocabulary of some Indonesian university entrants*. English Department Monograph, IKIP Kristen Satya Watjana.

Racette, A., & Peretz, I. (2007). Learning lyrics: To sing or not to sing? *Memory & Cognition, 35*(2), 242–253. https://doi.org/10.3758/BF03193445

Rahbar, S., & Khodabaksh, S. (2013). English songs as an effective asset to improve listening comprehension ability: Evidence from Iranian EFL learners. *International Journal of Applied Linguistics & English Literature, 2*(6), 63–66. https://doi.org/10.7575/aiac.ijalel.v.2n.6p.63

Rainey, D. W., & Larsen, J. D. (2002). The effect of familiar melodies on initial learning and long-term memory for unconnected text. *Music Perception, 20*, 173–186. https://doi.org/10.1525/mp.2002.20.2.173

Raphael, L. J., Borden, G. J., & Harris, K. S. (2007). *Speech science primer: Physiology, acoustics, and perception of speech* (5th ed.). Lippincott, Williams, and Wilkins.

Read, J. (1993). The development of a new measure of L2 vocabulary knowledge. *Language Testing, 10*(3), 355–371. https://doi.org/10.1177/026553229301000308

Read, J. (1998). Validating a test to measure depth of vocabulary knowledge. In A. Kunnan (Ed.), *Validation in language assessment* (pp. 41–60). Erlbaum.

Read, J. (2000). *Assessing vocabulary*. Cambridge University Press.

Read, J. (2004a). Plumbing the depths: How should the construct of vocabulary knowledge be defined? In P. Bogaards & B. Laufer (Eds.), *Vocabulary in a second language* (pp. 209–228). John Benjamins Publishing Company.

Read, J. (2004b). Research in teaching vocabulary. *Annual Review of Applied Linguistics, 24*, 146-161. https://doi.org/10.1017/S0267190504000078

Redgrave, P., Prescott, T. J., & Gurney, K. (1999). The basal ganglia: A vertebrate solution to the selection problem? *Neuroscience, 89*(4), 1009–1023. https://doi.org/10.1016/S0306-4522(98)00319-4

Reeve, C., & Williamson, J. (1987). Look what you've done to my song. *Modern English Teacher, 14*(4), 33–36. https://doi.org/10.26817/16925777.141

Reić Ercegovac, I., & Dobrota, S. (2011). Povezanost između glazbenih preferencija, sociodemografskih značajki i osobina ličnosti iz petfaktorskog modela [The relationship between musical preferences, sociodemographic characteristics, and Big Five personality traits]. *Psihologijske teme, 20*(1), 47–66. https://hrcak.srce.hr/file/102552

Repovš, G., & Baddeley, A. D. (2006). The multi-component model of working memory: Explorations in experimental cognitive psychology. *Neuroscience, 139*(1), 5–21. https://doi.org/10.1016/j.neuroscience.2005.12.061

Rezaei, M., & Ahour, T. (2016). The effect of listening to English songs on Iranian EFL pre-intermediate learners' listening comprehension. *The Journal of Applied Linguistics, 8*(16), 159–176.

Richards, J. (1969). Songs in language learning. *TESOL Quarterly, 3*(2), 161-174.

Richards, J. C. (1976). The role of vocabulary teaching. *TESOL Quarterly, 10*, 77-89.

Richards, J., & Rodgers, T. (2001). *Approaches and methods in language teaching* (p. 204). Cambridge University Press. https://doi.org/10.1017/CBO9780511667305.021

Richter, J., & Ostovar, R. (2016). "It don't mean a thing if it ain't got that swing"- An alternative concept for understanding the evolution of dance and music in human beings. *Frontiers in Human Neuroscience, 10,* Article 485. https://doi.org/10.3389/fnhum.2016.00485

Ripollés, P., Marco-Pallarés, J., Alicart, H., Tempelmann, C., & Rodríguez-Fornells, A. (2016). Intrinsic monitoring of learning success facilitates memory encoding via the activation of the SN/VTA-Hippocampal loop. *Neuroscience, 5*, e17441. https://doi.org/10.7554/eLife.17441

Ripollés, P., Ferreri, L., Mas-Herrero, E., Alicart, H., Gómez-Andrés, A., Marco-Pallares, J., Antonijoan, R. M., Noesselt, T., Valle, M., Riba, J., & Rodriguez-Fornells, A. (2018). Intrinsically regulated learning is modulated by synaptic dopamine signaling. *eLife, 7.* https://doi.org/10.7554/eLife.38113

Rivers, W. (1976). *Speaking in many tongues: Essays in foreign-language teaching.* Newbury House.

Robitzsch, A. (2020). Why ordinal variables can (almost) always be treated as continuous variables: Clarifying assumptions of robust continuous and ordinal factor analysis estimation methods. *Frontiers in Education, 5*, 589965. https://doi.org/10.3389/feduc.2020.589965

Römer, U. (2004). Comparing real and ideal language learner input: The use of an EFL textbook corpus in corpus linguistics and language teaching. In G. Aston, S. Bernardini, & D. Stewart (Eds.), *Corpora and language learners* (pp. 151–168). Benjamins.

Rogalsky, C., Rong, F., Saberi, K., & Hickok, G. (2011). Functional anatomy of language and music perception: Temporal and structural factors investigated using functional magnetic resonance imaging. *Journal of Neuroscience, 31*, 3843–3852. https://doi.org/10.1523/JNEUROSCI.4515-10.2011

Rogers, T. S. (1969). On measuring vocabulary difficulty: An analysis of item variables in learning Russian–English vocabulary pairs. *International Review of Applied Linguistics, 7*, 327–343.

Romberg, A. R., & Saffran, J. R. (2010). Statistical learning and language acquisition. *Wiley Interdisciplinary Reviews: Cognitive Science, 1*, 906–914. https://doi.org/10.1002/wcs.78

Romero, M. D., Bernal, L. M. T., & Olivares, M. C. (2012). Using songs to encourage sixth graders to develop speaking skills. *Profile, 14*(1), 11–28.

Ross, D. A., Olson, I. R., & Gore, J. C. (2003). Cortical plasticity in an early blind musician: An fMRI study. *Magnetic Resonance Imaging, 21*, 821–828. https://doi.org/10.1016/S0730-725X(03)00103-6

Rott, S. (1999). The effect of exposure frequency on intermediate language learners' incidental vocabulary acquisition through reading. *Studies in Second Language Acquisition, 21*(1), 589–619. https://www.jstor.org/stable/44486831

Rousseau, J.-J. (1781). *Essai sur l 'origine des langues.* Vénissieux, France: Éditions La Passe du Vent.

Rubin, J. (1987). Vocabulary learning strategies and foreign language acquisition. *English Language Teaching Journal, 41*(2), 118–125. http://kw-look.maruzen.co.jp/0200791416.pdf

Rubin, D. C., Wallace, W. T., & Houston, B. C. (1993). The beginnings of expertise for ballads. *Cognitive Science, 17*, 435–462. https://doi.org/10.1207/s15516709cog1703_4

Rühlemann, C. (2008). A register approach to teaching conversation: Farewell to Standard English? *Applied Linguistics, 29*(4), 672–693. https://doi.org/10.1093/applin/amn023

Rüschoff, B. (1998). Neue Medien als Grundlage neuer Lernwelten für das fremdsprachliche Lernen. *Französisch Heute, 1*, 21–33.

Rüschoff, B. (2010). Authenticity in language learning revisited: Materials, processes, aims. In B. O'Rourke & L. Carson (Eds.), *Contemporary studies in descriptive linguistics: Vol. 3. Language learner autonomy: Policy, curriculum, classroom* (pp. 121–134). Lang.

Ruigrok, A. N., Gholamreza, S. K., Lai, M. C., Baron-Cohen, S., Lombardo, M. V., Tait, R. J., & Suckling, J. (2014). A meta-analysis of sex differences in human brain structure. *Neuroscience and Biobehavioral Reviews, 39*, 34–50. https://doi.org/10.1016/j.neubiorev.2013.12.004

Rukholm, V. N., Helms-Park, R., Odgaard, E. C., & Smyth, R. (2018). Facilitating lexical acquisition in beginner learners of Italian through spoken or sung lyrics. *The Canadian Modern Language Review, 74*(1), 153–175. https://doi.org/10.3138/cmlr.3789

Rumlich, D. (2016). *Evaluation Bilingual Education in Germany. CLIL Students' General English Proficiency, EFL Self-Concept, and Interest.* Frankfurt am Main: Peter Lang GmbH.

Russell, V. (2020). Language anxiety and the online learner. *Foreign Language Annals, 53*(2), 338–352. https://doi.org/10.1111/flan.12461

Ryan, J. (1969). Grouping and short-term memory: Different means and patterns of grouping. *Quarterly Journal of Experimental Psychology, 21*, 137–147. https://doi.org/10.1080/14640746908400206

Sacks, O. (2007). *Musicophilia: Tales of music and the brain.* Random House LLC.
Sadakata, M., & Sekiyama, K. (2011). Enhanced perception of various linguistic features by musicians: A cross-linguistic study. *Acta Psychologica, 138*(1), 1–10. https://doi.org/10.1016/j.actpsy.2011.03.007

Särkämö, T., Tervaniemi, M., Laitinen, S., Forsblom, A., Soinila, S., Mikkonen, M., Autti, T., Silvennoinen, H. M., Erkkilä, J., Laine, M., Peretz, I., & Hietanen, M. (2014). Music listening enhances cognitive recovery and mood after a middle cerebral artery stroke. *Brain, 137*(1), 285-296. https://doi.org/10.1093/brain/awn013

Salas, R. (2006). *Wordsetting* (Unpublished master's thesis). Victoria University of Wellington, Wellington, New Zealand.

Salcedo, C. S. (2002). *The effects of songs in the foreign language classroom on text recall and involuntary mental rehearsal* (Doctoral dissertation, Louisiana State University).

Salcedo, C. S. (2010). The effects of songs in the foreign language classroom on text recall, delayed text recall, and involuntary mental rehearsal. *Journal of College Teaching and Learning, 7*(6), 19–30. https://www1.wellesley.edu/sites/default/files/assets/departments/pltc/files/faculty/salcedo_2010_songs_in_foreign_language_classrooms.pdf

Salcedo, C. S., & Harrison, L. G. (2002). The effects of song on text recall and involuntary mental rehearsal in foreign language learning. In M. Cherry (Ed.), *Joint conference of the Southern Conference on Language Teaching and the Louisiana Foreign Language Teachers' Association: Cyberspace and foreign languages: Making the connection* (pp. 91–102). Furman University. https://doi.org/10.19030/tlc.v7i6.126

Salimpoor, V. N., Benovoy, M., Larcher, K., Dagher, A., & Zatorre, R. J. (2011). Anatomically distinct dopamine release during anticipation and experience of peak emotion to music. *Nature Neuroscience, 14*, 257–262. https://doi.org/10.1038/nn.2726

Salimpoor, V. N., van den Bosch, I., Kovacevic, N., McIntosh, A. R., Dagher, A., & Zatorre, R. J. (2013). Interactions between the nucleus accumbens and auditory cortices predict music reward value. *Science, 340*, 216–219. https://doi.org/10.1126/science.1231059

Salmon, A. (2010). Using music to promote children's thinking and enhance their literacy development. *Early Child Development and Care, 180*(7), 937–945. https://doi.org/10.1080/03004430802550755

Sambanis, M. (2013). *Fremdsprachenunterricht und Neurowissenschaften*. Narr.

Sambanis, M., & Böttger, H. (2016). *Focus on evidence: Fremdsprachendidaktik trifft Neurowissenschaften*. Narr/francke/attempto.

Sambanis, M., & Böttger, H. (2018). *Focus on evidence II: Fremdsprachendidaktik trifft Neurowissenschaften*. Narr/francke/attempto.

Sambanis, M., & Walter, M. (2019). *In motion: Theaterimpulse zum Sprachenlernen. Von neuesten Befunden der Neurowissenschaft zu konkreten Unterrichtsimpulsen*. Cornelsen.

Sambanis, M., & Böttger, H. (2020). *Focus on evidence III: Fremdsprachendidaktik trifft Neurowissenschaften*. Narr/francke/attempto.

Sammler, D., Grigutsch, M., Fritz, T., & Koelsch, S. (2007). Music and emotion: Electrophysiological correlates of the processing of pleasant and unpleasant music. *Psychophysiology, 44*, 293–304. https://doi.org/10.1111/j.1469-8986.2007.00497.x

Sammler, D., Baird, A., Valabrègue, R., Clément, S., Dupont, S., Belin, P., & Samson, S. (2010). The relationship of lyrics and tunes in the processing of unfamiliar songs: An fMR adaptation study In *Journal of Neuroscience*, *10*, 3572–3578. https://doi.org/10.1523/JNEUROSCI.2751-09.2010

Sammler, D., & Elmer, S. (2020). Advances in the neurocognition of music and language. *Brain Sciences*, MDPI. https://doi.org/10.3390/brainsci10080509

Saragi, T., Nation, I. S. P., & Meister, G. F. (1978). Vocabulary learning and reading. *System, 6*(2), 72–78. https://doi.org/10.1016/0346-251X(78)90027-1

Sasao, Y., & Webb, S. (2017). The Word Part Levels Tests. *Language Teaching Research, 21*(1). https://doi.org/10.1177/13621688155860

Sasao, Y., & Webb, S. (2018). The guessing from context test. *ITL - International Journal of Applied Linguistics, 169*(1), 115–141. https://doi.org/10.1075/itl.00009.sas

Satri Adnyani, N. W. (2020). Teaching English vocabulary using song. *E-journal Institut Hindu Dharma Negeri Denpasar.*

Sawada, K. (2009). *Vocabulary acquisition through listening and its relation to learning channel preferences* (Unpublished doctoral thesis). Temple University, Tokyo, Japan.

Schecter, S. R., & Bayley, R. (2002). *Language socialization in multilingual and second language contexts*. Multilingual Matters.

Schellenberg, E. G., Krysciak, A., & Campbell, R. J. (2000). Perceiving emotion in melody: Effects of pitch and rhythm. *Music Perception, 18*, 155–172. https://doi.org/10.2307/40285907

Schellenberg, E. G., & Weiss, M. W. (2012). Music and cognitive abilities. In D. Deutsch (Ed.), *The psychology of music* (3rd ed., pp. 499–550). Elsevier. https://doi.org/10.1016/B978-0-12-381460-9.00012-2

Schläpfer, T. E., Harris, G. J., Tien, A. Y., Peng, L., Lee, S., & Pearlson, G. D. (1995). Structural differences in the cerebral cortex of healthy female and male subjects: A magnetic resonance imaging study. *Psychiatry Research, 61*, 129–135.Schlag, 2001. https://doi.org/10.1016/0925-4927(95)02634-A

Schlaug, G., Jäncke, L., Huang, Y., Staiger, J. F., & Steinmetz, H. (1995a). Increased corpus callosum size in musicians. *Neuropsychologia, 33*, 1047–1055. https://doi.org/10.1016/0028-3932(95)00045-5

Schlaug, G., Jäncke, L., Huang, Y., & Steinmetz, H. (1995b). In vivo evidence of structural brain asymmetry in musicians. *Science, 267*, 699–671. https://doi.org/10.1126/science.7839149

Schlaug G, Norton A, Overy K, Winner E. (2005). Effects of music training on brain and cognitive development. *Ann N Y Acad Sci.* 1060, 219–230. https://doi.org/10.1196/annals.1360.015

Schlaug, G., Forgeard, M., Zhu, L., Norton, A., & Winner, E. (2009). Training-induced neuroplasticity in young children. *Annals of the New York Academy of Sciences, 1169*, 205–208. https://doi.org/10.1111/j.1749-6632.2009.04842.x

Schlepp, K. (2001). Reasons for using songs in the ESL/EFL classroom. *The Internet TESL Journal, 7*(2), 1–4.

Schleuter, S. L. (1997). *A sound approach to teaching instrumentalists* (2nd ed.). Schirmer.

Schmenk, B. (2002). *Geschlechtsspezifisches Fremdsprachenlernen? Zur Konstruktion geschlechtstypischer Lerner- und Lernbilder in der Fremdsprachenforschung.* Stauffenburg Verlag.

Schmithorst, V. J., & Wilke, M. (2002). Differences in white matter architecture between musicians and non-musicians: A diffusion tensor imaging study. *Neuroscience Letters, 321*, 57–60. https://doi.org/10.1016/S0304-3940(02)00054-X

Schmitt, N. (1993). *Word knowledge: What it takes to really know a word* (Unpublished paper).

Schmitt, N. (1994). Vocabulary testing: Questions for test development with six examples of tests of vocabulary size and depth. *Thai TESOL Bulletin, 6*, 9–16. https://files.eric.ed.gov/fulltext/ED380993.pdf

Schmitt, N. (1998). Tracking the incidental acquisition of second language vocabulary: A longitudinal study. *Language Learning, 48*, 281–317. https://afa4be34-0fda-46d9-8e64-5adf13d4216b.filesusr.com/ugd/5f2482_d34e42207ed3487faffbca99df8852b3.pdf

Schmitt, N. (2000). Lexical chunks. *ELT Journal, 54*(4), 400–401. https://doi.org/10.1093/elt/54.4.400

Schmitt, N. (2000). *Vocabulary in language teaching*. Cambridge University Press.

Schmitt, N. (2008). Review article: Instructed second language vocabulary learning. *Language Teaching Research, 12*(3), 329–363. https://doi.org/10.1177/1362168808089921

Schmitt, N. (2010). *Researching vocabulary: A vocabulary research manual*. Palgrave Macmillan.

Schmitt, N. (2014). Size and depth of vocabulary knowledge: What the research shows. *Language Learning, 64*(4), 913–951. https://doi.org/10.1111/lang.12077

Schmitt, N., Schmitt, D., & Clapham, C. (2001). Developing and exploring the behaviour of two new versions of the Vocabulary Levels Test. *Language Testing, 18*(1), 55–88. https://doi.org/10.1177/026553220101800103

Schmitt, N., Jiang, X., & Grabe, W. (2011). The percentage of words known in a text and reading comprehension. *The Modern Language Journal, 95*, 26–43. https://www.lextutor.ca/cover/papers/schmitt_etal_2011.pdf

Schmitt, N., & Schmitt, D. (2020). *Vocabulary in language teaching* (2nd ed.). Cambridge University Press. https://doi.org/10.1017/9781108569057

Schneider, P., Scherg, M., Dosch, H. G., Specht, H. J., Gutschalk, A., & Rupp, A. (2002). Morphology of Heschl's gyrus reflects enhanced activation in the auditory cortex of musicians. *Nature Neuroscience, 5*, 688–694.https://doi.org/10.1038/nn871

Schneider, P., Sluming, V., Roberts, N., Scherg, M., Goebel, R., Specht, H. J., Dosch, H. G., Bleeck, S., Stippich, C., & Rupp, A. (2005). Structural and functional asymmetry of lateral Heschl's gyrus reflects pitch perception preference. *Nature Neuroscience, 8*, 1241–1247. https://doi.org/10.1038/nn1530

Schön, D., Magne, C., & Besson, M. (2004). The music of speech: Music training facilitates pitch processing in both music and language. *Psychophysiology, 41*, 341–349. https://doi.org/10.1111/1469-8986.00172.x

Schön, D., Boyer, M., Moreno, S., Besson, M., Peretz, I., Kolinsky, R. (2008). Songs as an aid for language acquisition. ScienceDirect, *Cognition, 106*, 975-983. https://doi.org/10.1016/j.cognition.2007.03.005

Schön, D., Gordon, R., Campagne, A., Magne, C., Astésano, C., Anton, J. L., & Besson, M. (2010). Similar cerebral networks in language, music, and song perception. *NeuroImage, 51*(1), 450–461. https://doi.org/10.1016/j.neuroimage.2010.02.023

Schön, D., & François, C. (2011). Musical expertise and statistical learning of musical and linguistic structures. *Frontiers in Psychology, 2*, 167. https://doi.org/10.3389/fpsyg.2011.00167

Schöpp, K. (2001). Reasons for using songs in the ESL/EFL classroom. *The Internet TESL Journal*. http://iteslj.org/Articles/Schoepp-Songs.html

Schug, M. D., Hutter, C. M., Wetterstrand, K. A., Gaudette, M. S., Mackay, T. F., & Aquadro, C. F. (1998). The mutation rates of di-, tri-, and tetranucleotide repeats in *Drosophila melanogaster*. *Molecular Biology and Evolution, 15*(12), 1751–1760. https://doi.org/10.1093/oxfordjournals.molbev.a025901

Schulgesetz für das Land Nordrhein-Westfalen [School Act for the State of North Rhine-Westphalia] (Schulgesetz NRW - SchulG). (2005). https://www.schulministerium.nrw/schulgesetz-fuer-das-land-nordrhein-westfalen?utm_source=chatgpt.com

Schultz, W. (2016). Dopamine reward prediction error signalling: A two-component response. *Nature Reviews Neuroscience, 17*(3), 183–195. https://doi.org/10.1038/nrn.2015.26

Schulz, M., Ross, B., & Pantev, C. (2003). Evidence for training-induced crossmodal reorganization of cortical functions in trumpet players. *NeuroReport, 14*, 157–161. https://doi.org/10.1097/00001756-200301200-00029

Schulz, J., Hamilton, C., Wonnacott, E., & Murphey, V. (2023). The impact of multi-word units in early foreign language learning and teaching contexts: A systematic review. *Review of Education, 11*(2). https://doi.org/10.1002/rev3.3413

Schulze, K., Mueller, K., & Koelsch, S. (2011). Neural correlates of strategy use during auditory working memory in musicians and non-musicians. *European Journal of Neuroscience, 33*, 189–196. https://doi.org/10.1111/j.1460-9568.2010.07470.x

Schurz, A., & Sundqvist, P. (2022). Connecting extramural English with ELT: Teacher reports from Austria, Finland, France, and Sweden. *Applied Linguistics, 43*(5), 934–957. https://doi.org/10.1093/applin/amac013

Schuster, D., & Mouzon, D. (1982). Music and vocabulary learning. *Journal of the Society for Accelerative Learning and Teaching, 7*(1), 82–106.

Schwanke, K., Steinlen, A. K., & Piste, T. (2015). *Haben Geschlecht und Migration Auswirkungen auf die fremdsprachlichen Leistungen (rezeptiver Wortschatz Englisch) in Grundschule und Gymnasium?* Presentation at the 3rd Annual Conference of the *Gesellschaft für Empirische Bildungsforschung (GEBF)*, 11–13 March 2015, Bochum, Germany.

Schwarz, M. (2013). Learning with Lady Gaga & Co: Incidental EFL vocabulary acquisition from pop songs. *Vienna English Working Papers, 22*, 17–58. https://doi.org/10.25365/thesis.20795

Scott, M. (2008). *WordSmith Tools* (Version 5). Lexical Analysis Software.

Scrivener, J. (2011). *Learning teaching: The essential guide to English language teaching*. Macmillan Education.Segado, M, Hollinger, A., Thibodeau, J., Penhune, V., Zatorre, R.J. (2018). Partially overlapping brain networks for singing and cell playing. *Frontiers in Neuroscience*, *12*(351). https://doi.org/10.3389/fnins.2018.00351

Seiffert, S., Weber, S., Sack, U., & Keller, T. (2024). Use of logit transformation within statistical analyses of experimental results obtained as proportions: Example of method validation experiments and EQA in flow cytometry. *Frontiers in Molecular Biosciences, 11*. https://doi.org/10.3389/fmolb.2024.1335174

Seppänen, M., Hamalainen, J., Pesonen, A. K., & Tervaniemi, M. (2012a). Music training enhances rapid neural plasticity of N1 and P2 source activation for unattended sounds. *Frontiers in Human Neuroscience, 6*(43). https://doi.org/10.3389/fnhum.2012.00043

Seppänen, M., Pesonen, A. K., & Tervaniemi, M. (2012b). Music training enhances the rapid plasticity of P3a/P3b event-related brain potentials for unattended and attended target sounds. *Attention, Perception, & Psychophysics, 74*(3), 600–612. https://doi.org/10.3758/s13414-011-0257-9

Serafine, M. L., Crowder, R. G., & Repp, B. H. (1984). Integration of melody and text in memory for songs. *Cognition, 16*(3), 285–303. https://doi.org/10.1016/0010-0277(84)90031-3

Service, E., & Craik, F. I. M. (1993). Differences between young and older adults in learning a foreign vocabulary. *Journal of Memory and Language, 32*(5), 608–623. https://doi.org/10.1006/jmla.1993.1031

Setia, R., Rozlan, A. R., Gopala Krishnan, S. N., Mohd Adam, A.F., Husin, N., Sabapythy, E., Razita, M., Mat So Od, S. M., Nurul Izatee, Y. Y., Mohd, R. R., Nur Amalia, A.J., Zozita Mohamed, K., Norhafiza, A. S. (2012). English songs as means of aiding students' proficiency development. *Asian Social Science, 8*(7), 270–274. https://doi.org/10.5539/ass.v8n7p270

Shakerian, P., Rezaei, O., Murnani, Z. T., & Moeinmanesh, H. (2016). Investigating the role of pop songs on vocabulary recall, attitude and retention of Iranian EFL learners: The case of gender. *Advances in Language and Literary Studies, 7*(2), 121–128. https://doi.org/10.7575/aiac.alls.v.7n.2p.121

Shen, C. (2009). Using English songs: An enjoyable and effective approach to ELT. *English Language Teaching, 2*(1), 88–94. https://doi.org/10.5539/elt.v2n1p8

Shepard, W., & Ascher, L. (1973). Effect of linguistic rule conformity on free recall in children and adults. *Developmental Psychology, 8*(1), 139. https://doi.org/10.1037/h0033838

Shiffrin, R. M. (1999). 30 years of memory. In C. Izawa (Ed.), *On human memory: Evolution, progress, and reflections on the 30th anniversary of the Atkinson-Shiffrin model* (pp. 17–33). Lawrence Erlbaum Associates Publishers.

Shurley, B. (2002). *The Shurley Method-Public and Private Schools*. http://www.shurley.com/Public.html

Simcock, M. (1993). Developing productive vocabulary using the "Ask and Answer" technique. *Guidelines, 15*(2), 1–7.

Sinclair, J. M. (1991). *Corpus, concordance, collocation*. Oxford University Press.

Skehan, P. (1998). *A cognitive approach to language learning*. Oxford University Press.

Slevc, L. R., & Miyake, A. (2006). Individual differences in second language proficiency: Does musical ability matter? *Psychological Science, 17*(8), 675–681. https://doi.org/10.1111/j.1467-9280.2006.01765.x

Slevc, L. R., Davey, N. S., Buschkuehl, M., & Jaeggi, S. M. (2009). Tuning the mind: Exploring the connections between musical ability and executive functions. *Cognition, 112*(2), 405–417. https://doi.org/10.1016/j.cognition.2016.03.017

Slevc, L. R., & Okada, B. M. (2015). Processing structure in language and music: A case for shared reliance on cognitive control. *Psychonomic Bulletin & Review, 22*(3), 637–652. https://doi.org/10.3758/s13423-014-0712-4

Sloboda, J. A. (1985). *The musical mind: The cognitive psychology of music*. Oxford, UK: Clarendon Press.

Sloboda, J. A., & Davidson, J. W. (1996). Learning to love: The development of audiences for music. *European Research in Music Education, 3*, 9–23.

Smith Salcedo, C. (2002). The effect of songs in the foreign language classroom on text recall and involuntary mental rehearsal (Doctoral dissertation, Louisiana State University). LSU Doctoral Dissertations, 1458.

Smith Salcedo, C. (2010). Comparative analysis of learning outcomes in face-to-face foreign language classes vs. language lab and online. *Journal of College Teaching & Learning, 7*(2), 1–10.

Sommer, H. T. (2016). Lieder singen – Sprachen lernen? In M. Sambanis & H. Böttger (Eds.), *Focus on evidence: Fremdsprachendidaktik trifft Neurowissenschaften* (pp. 311-326). Tübingen, Germany: Narr Francke Attempto.

Sommer, I. E. C., Aleman, A., Bouma, A., & Kahn, R. S. (2004). Do women really have more bilateral language representation than men? A meta-analysis of functional imaging studies. *Brain, 127*(Pt. 8), 1845–1852. https://doi.org/10.1093/brain/awh207

Sommer, I. E., Aleman, A., Somers, M., Boks, M. P., & Kahn, R. S. (2008). Sex differences in handedness, asymmetry of the planum temporale, and functional language lateralization. *Brain Research, 1206*, 76–88. https://doi.org/10.1016/j.brainres.2008.01.003

Sorensen, K. E., & Witter, M. P. (1983). Entorhinal efferents reach the caudatoputamen. *Neuroscience Letters, 35*(3), 259–264. https://doi.org/10.1016/0304-3940(83)90327-0

Spears, A. K. (1998). African-American language use: Ideology and so-called obscenity. In S. S. Mufwene, J. R. Rickford, G. Bailey, & J. Baugh (Eds.), *African-American English: Structure, history, and use* (pp. 226–250). New York, NY: Routledge. https://doi.org/10.4324/9781003165330-9

Speelman, C. P., Sibma, S., & MacLachlan, S. (2012). *Memory for sequence order in songs*. Paper presented at the 12th International Conference on Music Perception and Cognition and the 8th Triennial Conference of the European Society for the Cognitive Sciences of Music, Thessaloniki, Greece.

Spencer, M., Muse, A., Wagner, R. K., Foorman, B., Petscher, Y., Schatschneider, C., Tighe, E. L., & Bishop, M. D. (2015). Examining the underlying dimensions of morphological awareness and vocabulary knowledge. *Reading and Writing, 28*(6), 959–988. https://doi.org/10.1007/s11145-015-9557-0

Spicher, L., & Sweeney, F. (2007). Folk music in the L2 classroom: Development of native-like pronunciation through prosodic engagement strategies. *Connections, 1*, 35–48. http://fla-nc.org/wp/wp-content/uploads/2015/09/connectionsV1_2007.pdf

Spiegel, M. F., & Watson, C. S. (1984). Performance on frequency discrimination tasks by musicians and non-musicians. *Journal of the Acoustical Society of America, 76*(6), 1690–1695.

Spitzer, M. (2010). *Medizin für die Bildung. Ein Weg aus der Krise.* Heidelberg: Spektrum Akademischer Verlag.

Sposet, B. A. (2008). *The role of music in second language acquisition: A bibliographical review of seventy years of research*, 1937–2007. Lewiston, NY: Edwin Mellen Press.
Sprenger, M. (1999). *Learning & memory: The brain in action.* Alexandria: ASCD.

Spychiger, M. (2001). Understanding musical activity and musical learning as sign processes: Toward a semiotic approach to music education. *The Journal of Aesthetic Education, 35*(1), 53–68. https://doi.org/10.2307/3333771

Squire, L., & Kandel, E. (1999). *Memory: From mind to molecules.* New York, NY: Scientific American Library. https://escholarship.org/uc/item/91m2t112

Stæhr, L. (2008). Vocabulary size and the skills of listening, reading, and writing. *The Language Learning Journal, 36*(2), 139–152. http://dx.doi.org/10.1080/09571730802389975

Stahl, S. A. (1990). *Beyond the instrumentalist hypothesis: Some relationships between word meanings and comprehension* (Technical Report No. 505). Center for the Study of Reading, University of Illinois at Urbana-Champaign. https://files.eric.ed.gov/fulltext/ED321242.pdf

Stahl, S. A., & Fairbanks, M. M. (1986). The effects of vocabulary instruction: A model-based meta-analysis. *Review of Educational Research, 56*(1), 72–110. https://doi.org/10.2307/1170287

Staples, S. (1968). A paired-associates learning task utilizing music as the mediator: An exploratory study. *Journal of Music Therapy, 5*(2), 53–57. https://doi.org/10.1093/jmt/5.2.53

Statista. (2021). Number of people worldwide who speak English in 2021, by proficiency level. https://www.statista.com

Steinhauer, K., & Ullman, M. T. (2002). Consecutive ERP effects of morpho-phonology and morpho-syntax. *Brain and Language, 83*(1), 62–65. https://www.mcgill.ca/neurocoglab/files/neurocoglab/Steinhauer2002b_A.pdf

Steinmetz, H., Jäncke, L., Kleinschmidt, A., Schlaug, G., Volkmann, J., & Huang, Y. (1992). Sex but no hand difference in the isthmus of the corpus callosum. *Neurology, 42*(4), 749–752. https://doi.org/10.1212/WNL.42.4.749

Steinmetz, H., Staiger, J. F., Schlaug, G., Huang, Y., & Jäncke, L. (1995). Corpus callosum and brain volume in women and men. *NeuroReport, 6*(7), 1002–1004. https://doi.org/10.1097/00001756-199505090-00013

Stevens, J. P. (2009). *Applied multivariate statistics for the social sciences* (5th ed.). Routledge.

Stevens, J. S., & Hamann, S. (2012). Sex differences in brain activation to emotional stimuli: A meta-analysis of neuroimaging studies. *Neuropsychologia, 50*(7), 1578–1593. https://doi.org/10.1016/j.neuropsychologia.2012.03.011

Storkel, H. J. (2001). Learning new words: Phonotactic probability in language development. *Journal of Speech, Language, and Hearing Research, 44*(6), 1321–1337. https://doi.org/10.1044/1092-4388(2001/103)

Stoudenmire, J. (1975). A comparison of muscle relaxation training and music in the reduction of state and trait anxiety. *Journal of Clinical Psychology, 33*(2), 490–492. https://doi.org/10.1002/1097-4679(197507)31:3

Strafella, A. P., Paus, T., & Dagher, A. (2001). Repetitive transcranial magnetic stimulation of the human prefrontal cortex induces dopamine release in the caudate nucleus. *Journal of Neuroscience, 21*(15), RC157. https://doi.org/10.1523/JNEUROSCI.21-15-j0003.2001

Strait, D. L., Kraus, N., Parbery-Clark, A., & Ashley, R. (2010). Musical experience shapes top-down auditory mechanisms: Evidence from masking and auditory attention performance. *Hearing Research, 261*(1–2), 22–29. https://doi.org/10.1016/j.heares.2009.12.021

Strait, D. L., & Kraus, N. (2011a). Can you hear me now? Musical training shapes functional brain networks for selective auditory attention and hearing speech in noise. *Frontiers in Psychology, 2*, Article 113. https://doi.org/10.3389/fpsyg.2011.00113

Strait, D. L., & Kraus, N. (2011b). Playing music for a smarter ear: Cognitive, perceptual, and neurobiological evidence. *Music Perception, 29*(2), 133–147. https://doi.org/10.1525/MP.2011.29.2.133

Strait, D. L., & Kraus, N. (2014). Biological impact of auditory expertise across the life span: Musicians as a model of auditory learning. *Hearing Research, 308*, 109–121. https://doi.org/10.1016/j.heares.2013.08.004

Summer, T. (2010). The role of English songs in students' lives: A survey report. In G. Bell & R. Kupetz (Eds.), *Der Einsatz von Musik und die Entwicklung von Audio Literacy im Fremdsprachenunterricht: Fremdsprachendidaktik inhalts- und lernerorientiert* (pp. 317-330). Peter Lang.

Sundqvist, P. (2009). *Extramural English matters: Out-of-school English and its impact on Swedish ninth graders' oral proficiency and vocabulary*. Karlstad University Press.

Sundqvist, P., & Wikström, P. (2015). Out-of-school digital gameplay and in-school L2 English vocabulary outcomes. *System, 51*, 65–76. https://doi.org/10.1016/j.system.2015.04.001

Surkamp, C., & Viebrock, B. (2018). *Teaching English as a foreign language: An introduction*. J.B. Metzler.

Swain, M., & Lapkin, S. (1998). Interaction and second language learning: Two adolescent French immersion students working together. *The Modern Language Journal, 82*(3), 320–337. https://doi.org/10.1111/j.1540-4781.1998.tb01209.x

Swaminathan, S., & Gopinath, J. K. (2013). Music training and second-language English comprehension and vocabulary skills in Indian children. *Psychological Studies, 58*(1), 1–7. https://doi.org/10.1007/s12646-013-0180-3

Swann, W. B. Jr., Rentfrow, P. J., & Guinn, J. S. (2002). Self-verification: The search for coherence. In M. R. Leary & J. P. Tangney (Eds.), *Handbook of self and identity* (pp. 367–383). The Guilford Press.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12*(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4

Sweller, J. (1993). Some cognitive processes and their consequences for the organization and presentation of information. *Australian Journal of Educational Psychology, 45*, 1–8. https://doi.org/10.1080/00049539308259112
Sweller, J. (2003). Evolution of human cognitive architecture. In B. H. Ross (Ed.), *The psychology of learning and motivation* (Vol. 43, pp. 215–266). Academic Press.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Pearson.

Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics* (7th ed.). Pearson.

Tallal, P., & Gaab, N. (2006). Dynamic auditory processing, musical experience, and language development. *Trends in Neurosciences, 29*(7), 382–390. https://doi.org/10.1016/j.tins.2006.06.003

Tamminen, J., Rastle, K., Darby, J., Lucas, R., & Williamson, V. J. (2017). The impact of music on learning and consolidation of novel words. *Memory, 25*(1), 107–121. https://doi.org/10.1080/09658211.2015.1130843

Tannenbaum, K. R., Torgesen, J. K., & Wagner, R. K. (2006). Relationships between word knowledge and reading comprehension in third-grade children. *Scientific Studies of Reading, 10*(4), 381–398. https://doi.org/10.1207/s1532799xssr1004_3

Taub, E., Uswatte, G., & Elbert, T. (2002). New treatments in neurorehabilitation founded on basic research. *Nature Reviews Neuroscience, 3*(3), 228–236. https://doi.org/10.1038/nrn754

Tausch, R., & Tausch, A. M. (1979). *Erziehungspsychologie.* Göttingen, Germany: Hogrefe.

Tavakoli, M. (2013). The effect of task-based language teaching accompanied by songs on Iranian EFL learners' learning L2 grammar and their attitudes. *The Iranian EFL Journal, 19*(3), 112–135. https://doi.org/10.12973/iji.2018.11433a

Taylor, H. G., & Alden, J. (1997). Age-related differences in outcomes following childhood brain insults: An introduction and overview. *Journal of the International Neuropsychological Society, 3*(6), 555–567.

Tegge, F. (2015). *Investigating song-based language teaching and its effect on lexical learning* (Unpublished doctoral dissertation). Victoria University of Wellington.

Tegge, F. (2017). The lexical coverage of popular songs in English language teaching. *System, 67*, 87–98. https://doi.org/10.1016/j.system.2017.04.016

Tegge, F. (2018). Pop songs in the classroom: Time-filler or teaching tool? *ELT Journal, 72*(3), 274–284. https://doi.org/10.1093/elt/ccx071

Tervaniemi, M., Just, V., Koelsch, S., Widmann, A., & Schröger, E. (2005). Pitch discrimination accuracy in musicians vs. nonmusicians: An event-related potential and behavioral study. *Experimental Brain Research, 161*(1), 1–10. https://doi.org/10.1007/s00221-004-2044-5

Tervaniemi, M., Castaneda, A., Knoll, M., & Uther, M. (2006). Sound processing in amateur musicians and nonmusicians: Event-related potential and behavioral indices. *NeuroReport, 17*(11), 1225–1228. https://doi.org/10.1097/01.wnr.0000230510.55596.8b

Tervaniemi, M., Kruck, S., De Baene, W., Schröger, E., Alter, K., & Friederici, A. D. (2009). Top-down modulation of auditory processing: Effects of sound context, musical expertise, and attentional focus. *European Journal of Neuroscience, 30*(8), 1636–1642. https://doi.org/10.1111/j.1460-9568.2009.06955.x

Thaler, E. (2018). *Englisch unterrichten: Grundlagen, Kompetenzen, Methoden* (2nd ed.). Berlin, Germany: Cornelsen.

Thaut, M. H., Peterson, D. A., & McIntosh, G. C. (2005). Temporal entrainment of cognitive functions: Musical mnemonics induce brain plasticity and oscillatory synchrony in neural networks underlying memory. *Annals of the New York Academy of Sciences, 1060*(1), 243–254. https://doi.org/10.1196/annals.1360.017

Thiessen, E. D., & Saffran, J. R. (2009). How the melody facilitates the message and vice versa in infant learning and memory. In S. Dalla Bella, N. Kraus, K. Overy, C. Pantev, J. S. Snyder, M. Tervaniemi, & G. Schlaug (Eds.), *The neurosciences and music III: Disorders and plasticity* (Vol. 1169, pp. 225–233). Blackwell/New York Academy of Sciences.

Thompson, W. F., Schellenberg, E. G., & Husain, G. (2004). Decoding speech prosody: Do music lessons help? *Emotion, 4*, 46–64. https://doi.org/10.1037/1528-3542.4.1.46

Thompson, W. F., Schellenberg, E. G., & Letnic, A. K. (2011). Fast and loud background music hinders reading comprehension. *Psychology of Music, 40*(6), 700-708. https://doi.org/10.1177/0305735611400173

Thornbury, S. (1997). Reformulation and reconstruction: Tasks that promote 'noticing'. *ELT Journal, 51*(4), 326–335. https://doi.org/10.1093/elt/51.4.326

Thornbury, S. (2005). *How to teach speaking*. Longman.

Thornbury, S. (2019). *Learning language in chunks*. Cambridge Papers in ELT series. Cambridge University Press.

Thorne, S. L., & Black, R. W. (2011). Identity and interaction in Internet-mediated contexts. In M. Diamentis (Ed.), *The Routledge handbook of sociolinguistics around the world* (pp. 345–358). Routledge.

Tierney, A., & Kraus, N. (2013). Music training for the development of reading skills. *Progress in Brain Research, 207*, 209–241. https://doi.org/10.1016/B978-0-444-63327-9.00008-4

Tillmann, B., Janata, P., & Bharucha, J. J. (2003). Activation of the inferior frontal cortex in musical priming. *Cognitive Brain Research, 16*(2), 145–161. https://doi.org/10.1016/S0926-6410(02)00245-8

Tillmann, B., & Dowling, W. J. (2007). Memory decreases for prose, but not for poetry. *Memory & Cognition, 35*(3), 628–639. https://doi.org/10.3758/BF03193301

TIMSS. (2019). *Mathematische und naturwissenschaftliche Kompetenzen von Grundschulkindern in Deutschland im internationalen Vergleich*. Münster, Germany; New York, NY: Waxmann.

Tomasello, M. (2009). *Constructing a language.* Cambridge, MA: Harvard University Press.

Tomczak, E., & Lew, R. (2019). "The song of words": Teaching multi-word units with songs. *3L: The Southeast Asian Journal of English Language Studies, 25*(4), 16–33. https://doi.org/10.17576/3L-2019-2504-02

Tomlinson, B., & Masuhara, H. (2018). *Materials development for language learning*. Malden, MA: Wiley-Blackwell.

Tourville, J. A., Reilly, K. J., & Guenther, F. H. (2008). Neural mechanisms underlying auditory feedback control of speech. *NeuroImage, 39*(3), 1429–1443. https://doi.org/10.1016/j.neuroimage.2007.09.054

Trainor, L. J., & Trehub, S. E. (1992). A comparison of infants' and adults' sensitivity to Western musical structure. *Journal of Experimental Psychology: Human Perception and Performance, 18*(2), 394–402. https://doi.org/10.1037/0096-1523.18.2.394

Trainor, L. J., Desjardins, R. N., & Rockel, C. (1999). A comparison of contour and interval processing in musicians and nonmusicians using event-related potentials. *Australian Journal of Psychology, 51*(3), 147–153. https://trainorlab.mcmaster.ca/publications/pdfs/trainor_desjardins.pdf

Trapp, E. A. (1991). Break down inhibitions and build up understanding with music, music, music. *Hispania, 74*(2), 437–438. https://doi.org/10.1016/j.neuroimage.2007.09.054

Trehub, S. E., Schellenberg, G., & Hill, D. (2000). The origins of music: Perception and cognition: A developmental perspective. In I. Deliège & J. A. Sloboda (Eds.), *Perception and cognition of music* (pp. 96–120). Psychology Press.

Trollinger, L. M. (2021). Sex/gender research in music education: A review. *The Quarterly Journal for Music Teaching and Learning, 16*(Special Volume), Article 5. https://digitalcommons.lib.uconn.edu/vrme/vol16/iss5/5

Ullman, M. T. (2001). A neurocognitive perspective on language: The declarative/procedural model. *Nature Reviews Neuroscience, 2*(10), 717–726. https://doi.org/10.1038/35094573

Ullman, M. T. (2004). Contribution of memory circuits to language: The declarative/procedural model. *Cognition, 92*(1–2), 231–270. https://doi.org/10.1016/j.cognition.2003.10.008

Ullman, M. T., & Estabrooke, I. V. (2004). Grammar, tools, and sex. *Journal of Cognitive Neuroscience Supplement, 67*. https://doi.org/10.1162/jocn.1997.9.2.266

Ullman, M. T., Miranda, R. A., & Travers, M. L. (2008). Sex differences in the neurocognition of language. In J. B. Becker, K. J. Berkley, N. Geary, E. Hampson, J. Herman, & E. Young (Eds.), *Sex on the brain: From genes to behavior* (pp. 291–309). New York, NY: Oxford University Press.

Underwood, G., Schmitt, N., & Galpin, A. (2004). The eyes have it: An eye-movement study into the processing of formulaic sequences. In N. Schmitt (Ed.), *Formulaic sequences: Acquisition, processing and use* (pp. 153–172). Amsterdam, The Netherlands: John Benjamins.

University of Oxford. (2016). *Style guide.* Public Affairs Directorate, University of Oxford.

Upitis, R., & Smithrim, K. (2001). *Learning through the arts: National assessment interim report.* Toronto, ON: The Royal Conservatory of Music. https://doi.org/10.2307/1602156

Ur, P. (2012). *A course in English language teaching.* Cambridge, UK: Cambridge University Press.

Urbancic, A., & Vizmuller, J. (1981). Using popular music in the language classroom. *The Canadian Modern Language Review, 38*(1), 81–87.

Van Assel, J. (1970). Music as an aid to teaching German in the elementary schools. *ERIC Report.* ED046306.

Van den Heuvel, M. P., & Sporns, O. (2013). Network hubs in the human brain. *Trends in Cognitive Sciences, 17*(12), 683–696. https://doi.org/10.1016/j.tics.2013.09.012

Van der Zwaag, M. D., Westerink, J. H. D. M., & van den Broek, E. L. (2011). Emotional and psychophysiological responses to tempo, mode, and percussiveness. *Musicae Scientiae, 15*(2), 250–269. https://doi.org/10.1177/1029864911403364

Van Lier, L. (1988). *The classroom and the language learner.* London, UK: Longman.

Van Zeeland, H., & Schmitt, N. (2013a). Lexical coverage in L1 and L2 listening comprehension: The same or different from reading comprehension? *Applied Linguistics, 34*(4), 457–479. https://doi.org/10.1093/applin/ams074

Van Zeeland, H., & Schmitt, N. (2013b). Incidental vocabulary acquisition through L2 listening: A dimensions approach. *System, 41*, 609–624. https://doi.org/10.1016/j.system.2013.07.012

Van Zuijen, T. L., Sussman, E., Winkler, I., Näätänen, R., & Tervaniemi, M. (2004). Grouping of sequential sounds: An event-related potential study comparing musicians and nonmusicians. *Journal of Cognitive Neuroscience, 16*(2), 331–338. https://doi.org/10.1162/089892904322984607

Van Zuijen, T. L., Sussman, E., Winkler, I., Näätänen, R., & Tervaniemi, M. (2005). Auditory organization of sound sequences by a temporal or numerical regularity: A mismatch negativity study comparing musicians and non-musicians. *Brain Research Cognitive Brain Research, 23*(2–3), 270–276. https://doi.org/10.1016/j.cogbrainres.2004.10.007

Vanden Bosch der Nederlanden, C. M., Joanisse, M. F., & Grahn, J. A. (2020). Music as a scaffold for listening to speech: Better neural phase-locking to song than speech. *NeuroImage, 214*, Article 116767. https://doi.org/10.1016/j.neuroimage.2020.116767

Vaughn, K. (2000). Music and mathematics: Modest support for the oft-claimed relationship. *The Journal of Aesthetic Education, 34*(3/4), 149–166. https://doi.org/10.2307/3333641

Vidal, K. (2003). Academic listening: A source of vocabulary acquisition? *Applied Linguistics, 24*(1), 56–89. https://doi.org/10.1093/applin/24.1.56

Vidal, K. (2011). A comparison of the effect of reading and listening on incidental vocabulary acquisition. *Language Learning, 61*(1), 219–258. https://doi.org/10.1111/j.1467-9922.2010.00593.x

Vigneau, M., Beaucousin, V., Hervé, P. Y., Duffau, H., Crivello, F., Houde, O., Mazoyer, B., & Tzourio-Mazoyer, N. (2006). Meta-analyzing left hemisphere language areas: Phonology, semantics, and sentence processing. *NeuroImage, 30*(4), 1414–1432. https://doi.org/10.1016/j.neuroimage.2005.11.00

Vinzentius, C. (2007). *Let's sing and rap! Wortschatzarbeit zu Themenfeldern in einem Song- und Rap-gestützten Englischunterricht der Grundschule* (Doctoral dissertation). Lübeck, Germany.

Vivone, A. (2024). Identifying musical and linguistic features triggering involuntary musical imagery: An ecoempirical study with pupils and teenagers in an educational context. In *Innovación docente e investigación en educación: Desafíos de la enseñanza y aprendizaje en la educación superior* (pp. 505-525). Dykinson. https://doi.org/10.14679/3762

Voyer, D., & Voyer, S. D. (2014). Gender differences in scholastic achievement: A meta-analysis. *Psychological Bulletin, 140*(4), 1174–1204. https://doi.org/10.1037/a0036620

Vuust, P., Roepstorff, A., Wallentin, M., Mouridsen, K., & Østergaard, L. (2006). It don't mean a thing: Keeping the rhythm during polyrhythmic tension activates language areas (BA47). *NeuroImage, 31*(2), 832–841. https://doi.org/10.1016/j.neuroimage.2005.12.037

Wallace, W. T. (1994). Memory for music: Effect of melody on recall of text. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 20*(6), 1471–1485. https://doi.org/10.1037/0278-7393.20.6.1471

Wallace, K. (2014). When instrumentalists sing. *International Journal of Music Education, 32*(4), 499–513. https://doi.org/10.1177/0255761413519052

Wallace, W. T., & Rubin, D. C. (1991). Characteristics and constraints in ballads and their effects on memory. *Discourse Processes, 14*(2), 181–202. https://doi.org/10.1080/01638539109544781

Wallace, W. T., & Schulkind, M. (1997). *Memory for songs: Structural versus substantive processing*. Unpublished manuscript, Duke University, Durham, NC. https://doi.org/10.3758/bf03198542

Wallin, N. L., Merker, B., & Brown, S. (Eds.). (2000). *The origins of music.* Cambridge, MA: MIT Press.

Walz, G. (2001). Die richtige Notenskala: Grenzen der zulässigen Umrechnung von Punktzahlen in Notenstufen. *Schulverwaltung Baden-Württemberg, 10*, 155–156.

Wan, C. Y., & Schlaug, G. (2010). Music making as a tool for promoting brain plasticity across the life span. *The Neuroscientist, 16*(5), 566–577. https://doi.org/10.1177/1073858410377805

Waring, R. (2002). Scales of vocabulary knowledge in second language vocabulary assessment. *Kiyo (Occasional papers of Notre Dame Seishin University, Okayama), 26*(1), 40–54.

Waring, R., & Takaki, M. (2003). At what rate do learners learn and retain new vocabulary from reading a graded reader? *Reading in a Foreign Language, 15*(2), 130–163. https://doi.org/10.64152/10125/66776

Warschauer, M., & Grimes, D. (2007). Learning with laptops: A multi-method case study. *Journal of Educational Computing Research, 38*(3), 305–332. https://doi.org/10.2190/EC.38.3.d

Webb, S. (2002). *Investigating the effects of learning tasks on vocabulary knowledge* (Unpublished doctoral dissertation). Victoria University of Wellington, New Zealand.

Webb, S. (2005). Receptive and productive vocabulary learning: The effect of reading and writing on word knowledge. *Studies in Second Language Acquisition, 27*(1), 33–52. https://doi.org/10.1017/S0272263105050023

Webb, S. (2007a). Learning word pairs and glossed sentences: The effects of a single context on vocabulary knowledge. *Language Teaching Research, 11*(1), 63–81. https://doi.org/10.1177/1362168806072463

Webb, S. (2007b). The effect of repetition on vocabulary knowledge. *Applied Linguistics, 28*(1), 46–65. https://doi.org/10.1093/applin/aml048

Webb, S. (2007c). The effects of synonymy on second language vocabulary learning. *Reading in a Foreign Language, 19*(2), 232–245. https://doi.org/10.64152/10125/66814

Webb, S. (2008). Receptive and productive vocabulary size. *Studies in Second Language Acquisition, 30*(1), 79–95. https://doi.org/10.1017/S0272263108080042

Webb, S., & Rodgers, M. P. H. (2009a). The vocabulary demands of television programs. *Language Learning, 59*(2), 335–366. https://doi.org/10.1111/j.1467-9922.2009.00509.x

Webb, S., & Rodgers, M. P. H. (2009b). The lexical coverage of movies. *Applied Linguistics, 30*(3), 407–427. https://doi.org/10.1093/applin/amp010

Webb, S. A., & Chang, A. C.-S. (2012a). Second language vocabulary growth. *RELC Journal, 43*(1), 113–126. https://doi.org/10.1177/0033688212439367

Webb, S. A., & Chang, A. C.-S. (2012b). How does prior word knowledge affect vocabulary learning progress in an extensive reading program? *Studies in Second Language Acquisition, 37*(4), 651–675. https://doi.org/10.1017/S0272263114000606

Webb, S. A., Newton, J., & Chang, A. C.-S. (2013). Incidental learning of collocation. *Language Learning, 63*(1), 91–120. https://doi.org/10.1111/j.1467-9922.2012.00729.x

Webb, S., & Chang, A. C.-S. (2015a). Second language vocabulary learning through extensive reading: How does frequency and distribution of occurrence affect learning? *Language Teaching Research, 19*(6), 667–686. https://doi.org/10.1177/1362168814559800

Webb, S., & Nation, P. (2017). *How vocabulary is learned.* Oxford University Press.

Weeks, B. P., & Nilsson, U. (2010). Music interventions in patients during coronary angiographic procedures: A randomized controlled study of the effect on patients' anxiety and well-being. *European Journal of Cardiovascular Nursing, 10*(1), 88–93. https://doi.org/10.1016/j.ejcnurse.2010.07.002

Weener, P. (1971). Language structure and free recall of verbal messages by children. *Developmental Psychology, 5*(2), 237–243. https://doi.org/10.1037/h0031266

Weiner, J. (1991). *The empty place: Poetry, space, and being among the Foi of Papua New Guinea*. Bloomington, IN: Indiana University Press.

Weinert, R. (1995). The role of formulaic language in second language acquisition: A review. *Applied Linguistics, 16*(2), 180–205.

Weir, J. P. (2005). Quantifying test-retest reliability using the intraclass correlation coefficient and the SEM. *Journal of Strength and Conditioning Research, 19*(1), 231–240. https://doi.org/10.1519/15184.1

Welch, G. F., & Howard, D. M. (2001). Evaluating the singing voice. *Logopedics Phoniatrics Vocology, 26*(2), 2–10. https://doi.org/10.1093/acprof:oso/9780198530329.003.0016

Werner, V. (2008). *'Love is all around': A corpus-based study on pop music lyrics* (Unpublished master's dissertation). Universität Bamberg, Bamberg, Germany.

Werner, V. (2012). Love is all around: A corpus-based study of pop music lyrics. *Corpora, 7*(1), 19–50. https://doi.org/10.3366/cor.2012.0016

Werner, R. (2018a). Music, movement and memory: Pedagogical songs as mnemonic aids. *TESOL Journal, 9*(4), Article e00387. https://doi.org/10.1002/tesj.387

Werner, V. (2018b). Linguistics and pop culture: Setting the scene(s). In V. Werner (Ed.), *The language of pop culture* (pp. 3–26). New York, NY: Routledge.

Werner, V. (2019a). Assessing hip-hop discourse: Linguistic realness and styling. *Text & Talk, 39*(5), 671–698. https://doi.org/10.1515/text-2019-2044

Werner, V. (2019b). Lyrics and language awareness. *Nordic Journal of Modern Language Methodology, 7*(1), 4–28. https://doi.org/10.20378/irb-47459

Werner, V. (2020). TV discourse, grammaticality, and language awareness. *TESL-EJ, 24*(1), Article 3. https://doi.org/10.20378/irb-49030

Werner, V. (2021a). Teaching grammar through pop culture. In *Pop culture in language education: Theory, research, practice*. Routledge Research in Language Education. New York, NY: Routledge.

Werner, V. (2021b). "Song-advantage" or "cost of singing"? A research synthesis of classroom-based intervention studies applying lyrics-based language teaching. *Journal of Second Language Teaching and Research, 8*, 138–170. https://doi.org/10.20378/irb-49313

Werner, V., & Tegge, F. (2021). *Pop culture in language education: Theory, research, practice.* Routledge Research in Language Education. New York, NY: Routledge.

Wesche, M., & Paribakht, T. S. (1996). Assessing second language vocabulary knowledge: Depth versus breadth. *The Canadian Modern Language Review, 53*(1), 13–40.

West, M. (1953). *A general service list of English words.* London, UK: Longman, Green & Co.

Westphal, M. (2021). *Pop music and Teaching English as an International Language.* Routledge.

Wests, M. P. (1955/1956). In the classroom: The problem of pupil talking-time. *English Language Teaching, 10*(2), 71–73. https://doi.org/10.34301/alsc.v2i2.22

White, R. V. (2000). *The ELT curriculum.* Oxford, UK: Blackwell.

Wilcox, W. B. (1995). *Music cues from classroom singing for second language acquisition: Prosodic memory for pronunciation of target vocabulary by adult nonnative English speakers* (Unpublished doctoral dissertation). University of Kansas.

Wilcox, W. B. (1996). *Music cues from classroom singing for second language acquisition: Prosodic memory for pronunciation of target vocabulary by adult nonnative English speakers* (Unpublished doctoral dissertation). University of Kansas, Wichita.

Wilkins, D. A. (1972). *Linguistics in language teaching.* Cambridge, UK: MFT Press.

Williams, M., & Burden, R. (1997). *Psychology for language teachers: A social constructivist approach*. Cambridge University Press.

Williamson, V. J., & Müllensiefen, D. (2012). Earworms from three angles: Situational antecedents, personality predisposition, and the quest for a musical formula. In E. Cambouropoulos, C. Tsougras, P. Mavromatis, & K. Pastiadis (Eds.), *Proceedings of the 12th International Conference on Music Perception and Cognition and the 8th Triennial Conference of the European Society for the Cognitive Sciences of Music* (pp. 1124–113). https://research.gold.ac.uk/id/eprint/10192/1/1124_Proc.pdf

Williamson, V. J., Liikkanen, L. A., Jakubowski, K., & Stewart, L. (2014). Sticky tunes: How do people react to involuntary musical imagery? *PLoS ONE, 9*(1), Article e86170. https://doi.org/10.1371/journal.pone.0086170

Willis, J. (2010). The current impact of neuroscience on teaching and learning. In D. A. Sousa (Ed.), *Mind, brain, and education: Neuroscience implications for the classroom* (pp. 45–66). Bloomington, IN: Solution Tree Press.

Willis, B. D., & Mason, K. (1994). Canciones en la clase: The why and how of integrating songs in Spanish by English-speaking and bilingual artists. *Hispania, 77*(1), 102–109.

Willis, M., & Ohashi, Y. (2012). A model of L2 vocabulary learning and retention. *Language Learning Journal, 40*(1), 125–137. https://doi.org/10.1080/09571736.2012.658232

Witelson, S. F., Glezer, I. I., & Kigar, D. L. (1995). Women have greater density of neurons in posterior temporal cortex. *Journal of Neuroscience, 15*(5), 3418–3428. https://doi.org/10.1523/JNEUROSCI.15-05-03418.1995

Wolfe, P. (2010). *Brain matters: Translating research into classroom practice* (2nd ed.). ASCD.

Wolfe, E. E., & Noguchi, L. K. (2009). The use of music with young children to improve sustained attention during a vigilance task in the presence of auditory distractions. *Journal of Music Therapy, 46*(1), 69–82. https://doi.org/10.1093/jmt/46.1.69

Wolff, D. (2002). *Fremdsprachenlernen als Konstruktion: Grundlagen für eine konstruktivistische Fremdsprachendidaktik.* Frankfurt am Main, Germany: Lang.

Wong, P. C. M., Perrachione, T. K., & Parrish, T. B. (2007a). Neural characteristics of successful and less successful speech and word learning in adults. *Human Brain Mapping, 28*(10), 995–1006. https://doi.org/10.1002/hbm.20330

Wong, P. C. M., Skoe, E., Russo, N. M., Dees, T., & Kraus, N. (2007b). Musical experience shapes human brainstem encoding of linguistic pitch patterns. *Nature Neuroscience, 10*(4), 420–422. https://doi.org/10.1038/nn1872

Wood, D. (2010). *Formulaic language and second language speech fluency: Background, evidence, and classroom applications*. London, UK: Bloomsbury Publishing.

Wray, A. (2002). *Formulaic language and the lexicon.* Cambridge, UK: Cambridge University Press.

Wray, A. (2008). *Formulaic language: Pushing the boundaries*. Oxford, UK: Oxford University Press.

Wray, A. (2012). What do we (think we) know about formulaic language? An evaluation of the current state of play. *Annual Review of Applied Linguistics, 32*, 231–254. https://doi.org/10.1017/S026719051200013X

Wray, A. (2013). Formulaic language. *Language Teaching, 46*(3), 316–334. https://doi.org/10.1017/S0261444813000013

Wray, A., & Perkins, M. (2000). Functions of formulaic language. *Language and Communication, 20*(1), 1–28. https://doi.org/10.1016/S0271-5309(99)00015-4

Xi, X. (2021). English teachers' perspectives on using music in English language teaching in Thai secondary schools. *Theory and Practice in Language Studies, 11*(2), 145–150. https://doi.org/10.17507/tpls.1102.05

Yalch, R. F. (1991). Memory in a jingle jungle: Music as a mnemonic device in communicating advertising slogans. *Journal of Applied Psychology, 76*(3), 268–275. https://doi.org/10.1037/0021-9010.76.2.268

Yan, C., & He, Y. (2011). Driving and driven architectures of directed small-world human brain functional networks. *PLoS ONE, 6*(8), e23460. https://doi.org/10.1371/journal.pone.0023460

Yen Dang, T. N. (2020). The potential for learning specialized vocabulary of university lectures and seminars through watching discipline-related TV programs: Insights from medical corpora. *TESOL Quarterly, 54*(2), 297–324. https://doi.org/10.1002/tesq.552

Yousefi, A., Yekta, R. R., & Farahmandian, H. (2014). The effect of modern lyrical music on second language vocabulary acquisition. *Mediterranean Journal of Social Sciences, 5*(23), 2583. https://doi.org/10.5901/mjss.2014.v5n23p2583

Zarate, J. M. (2013). The neural control of singing. *Frontiers in Human Neuroscience, 7*(237), 1–12. https://doi.org/10.3389/fnhum.2013.00237

Zatorre, R. L., Evans, A. C., & Meyer, E. (1994). Neural mechanisms underlying melodic perception and memory for pitch. *Journal of Neuroscience, 14*(4), 1908–1919. https://doi.org/10.1523/JNEUROSCI.14-04-01908.1994

Zatorre, R. J., Perry, D. W., Beckett, C. A., Westbury, C. F., & Evans, A. C. (1998). Functional anatomy of musical processing in listeners with absolute pitch and relative pitch. *Proceedings of the National Academy of Sciences, 95*(6), 3172–3177. https://doi.org/10.1073/pnas.95.6.3172

Zatorre, R. J., & Belin, P. (2001). Spectral and temporal processing in human auditory cortex. *Cerebral Cortex, 11*(10), 946–953. https://doi.org/10.1093/cercor/11.10.946

Zatorre, R. J., Belin, P., & Penhune, B. B. (2002). Structure and function of auditory cortex: Music and speech. *Trends in Cognitive Sciences, 6*(1), 37–46. https://doi.org/10.1016/S1364-6613(00)01816-7

Zatorre, R. J., Chen, J. L., & Penhune, V. B. (2007). When the brain plays music: Auditory-motor interactions in music perception and production. *Nature Reviews Neuroscience, 8*(7), 547–558. https://doi.org/10.1038/nrn2152

Zatorre, R. J., & Gandour, J. T. (2008). Neural specializations for speech and pitch: Moving beyond the dichotomies. *Philosophical Transactions of the Royal Society B: Biological Sciences, 363*(1493), 1087–1104. https://doi.org/10.1098/rstb.2007.2161

Zaunbauer, A. C. M., Retelsdorf, J., & Möller, J. (2009). Die Vorhersage von Englischleistungen am Anfang der Sekundarstufe. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie, 41*(3), 153–164. https://doi.org/10.1026/0049-8637.41.3.153

Zentrum für Empirische Pädagogische Forschung (ZEPF). (2023). *VERA 3 NRW: Vergleichsarbeiten in Klasse 3. Allgemeine Informationen und Ergebnisse des Durchgangs 2023 in Nordrhein-Westfalen*. Universität Koblenz-Landau, Campus Landau. https://www.schulentwicklung.nrw.de/e/upload/vera3/mat_2023/Bericht_VERA-3_2023.pdf

Zeromskaite, I. (2014). The potential role of music in second language learning: A review article. *Journal of European Psychology Students, 5*(3), 78–88. https://doi.org/10.5334/jeps.ci

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). Academic Press. https://doi.org/10.1016/B978-012109890-2/50031-7

Zimmerman, B. J., & Schunk, D. H. (Eds.). (2011). *Handbook of self-regulation of learning and performance*. Routledge.

Zillman, D., & Gan, S. (1997). Musical taste in adolescence. In D. J. Hargreaves & A. C. North (Eds.), *The social psychology of music* (pp. 161–188). Oxford, UK: Oxford University Press.

Zipf, G. K. (1949). *Human behavior and the principle of least effort: An introduction to human ecology*. New York, NY: Hafner.

Zola, M., & Sandvoss, J. (1976). Song in second-language teaching: The uses of imagery. *The Canadian Modern Language Review, 33*(1), 73–85. https://doi.org/10.3138/cmlr.33.1.73

Zwaan, R. A., & Taylor, L. J. (2006). Seeing, acting, understanding: Motor resonance in language comprehension. *Journal of Experimental Psychology: General, 135*(1), 1–11. https://doi.org/10.1037/0096-3445.135.1.1

Zydatiß, W. (2002). *Leistungsentwicklung und Sprachstandserhebungen im Englischunterricht*. Frankfurt, Germany: Peter Lang.

APPENDICES

Appendix A

Table A1: *Linguistic Analysis of Pop Song Lyrics*

Song title	Number of tokens	Number types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
Here Without You	302	106	94	35.09	1_gsl_1st_1000= 91.40% 2_gsl_2nd_1000 =5.60% 3_awl_570= 0.00 % not in lists= 3.00%	1.53	67.78
If I Ain't Got You	568	152	134	26.76	1_gsl_1st_1000= 87.30% 2_gsl_2nd_1000 =6.20% 3_awl_570= 0.50 % not in lists= 6.00%	2.72	141.69
One Day in Your Life	354	99	89	27.96	1_gsl_1st_1000= 92.40% 2_gsl_2nd_1000 =3.10% 3_awl_570= 0.00% not in lists= 4.50%	1.67	97.5
Sweet Dreams	457	120	109	26.25	1_gsl_1st_1000= 88.40%	2.19	214

Song title	Number of tokens	Number types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
					2_gsl_2nd_1000 =6.30% 3_awl_570= 0.20% not in lists= 5.00%		
Beautiful Liar	355	114	100	32.11	1_gsl_1st_1000= 83.90% 2_gsl_2nd_1000 =3.40% 3_awl_570= 0.80% not in lists= 11.80%	2.01	170.25
Just the Way You are	188	69	62	36.70	1_gsl_1st_1000= 93.10% 2_gsl_2nd_1000 =2.10% 3_awl_570= 0.00% not in lists= 4.80%	0.92	81.69
Count on Me	318	84	75	26.41	1_gsl_1st_1000= 87.40% 2_gsl_2nd_1000 =1.30% 3_awl_570= 0.00% not in lists= 11.30%	3.7	154.44

Song title	Number of tokens	Number types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
Dangerous	231	75	68	32.46	1_gsl_1st_1000= 90.90% 2_gsl_2nd_1000 =6.10% 3_awl_570= 0.00% not in lists= 3.00%	1.53	105.25
Au Revoir	373	91	84	24.39	1_gsl_1st_1000= 67.00% 2_gsl_2nd_1000 =4.00% 3_awl_570= 0.80% not in lists= 28.20%	1.54	144.91
I'm Alive	247	80	72	32.38	1_gsl_1st_1000= 89.50% 2_gsl_2nd_1000 =9.30% 3_awl_570= 0.00% not in lists= 1.20%	1.29	116.03
Forever	494	139	127	28.13	1_gsl_1st_1000= 80.60% 2_gsl_2nd_1000 =6.50% 3_awl_570= 0.00%	2.32	178.85

Song ti-tle	Num-ber of tokens	Num-ber types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
					not in lists= 13.00%		
Ain't no Other Man	515	138	113	26.79	1_gsl_1st_1000= 86.00% 2_gsl_2nd_1000 =0.80% 3_awl_570= 1.20% not in lists= 12.00%	2.38	201.58
Viva la Vida	293	128	118	43.68	1_gsl_1st_1000= 84.60% 2_gsl_2nd_1000 =5.80% 3_awl_570= 0.30% not in lists= 9.20%	1.82	139.02
This is Me	345	88	74	25.50	1_gsl_1st_1000= 93.60% 2_gsl_2nd_1000 =4.10% 3_awl_570= 0.00% not in lists= 2.30%	1.86	194.08
Lights	332	82	72	24.69	1_gsl_1st_1000= 97.90%	1.75	154.42

Song title	Number of tokens	Number types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
					2_gsl_2nd_1000 =1.20% 3_awl_570= 0.00% not in lists= 0.90%		
Right Round	603	191	179	31.67	1_gsl_1st_1000= 82.80% 2_gsl_2nd_1000 =5.30% 3_awl_570= 0.30% not in lists= 11.60%	2.97	304.77
What I've Been Looking for	198	67	54	33.83	1_gsl_1st_1000= 97.00% 2_gsl_2nd_1000 =1.00% 3_awl_570= 1.00% not in lists= 1.00%	1.9	93.5
What Time is It?	433	133	119	30.71	1_gsl_1st_1000= 87.50% 2_gsl_2nd_1000 =2.80% 3_awl_570= 1.20% not in lists= 8.50%	2.31	119.39

Song title	Number of tokens	Number types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
I want It All	591	185	163	31.30	1_gsl_1st_1000= 87.30% 2_gsl_2nd_1000 =3.60% 3_awl_570= 0.00% not in lists= 9.10%	2.44	121.94
We're All in This Together	448	109	95	24.33	1_gsl_1st_1000= 94.00% 2_gsl_2nd_1000 =2.00% 3_awl_570= 0.20% not in lists= 3.80%	2.03	107.27
High School Musical	460	141	119	30.65	1_gsl_1st_1000= 92.60% 2_gsl_2nd_1000 =1.10% 3_awl_570= 0.20% not in lists= 6.10%	2.01	112.2
You Give Me Something	249	90	82	36.14	1_gsl_1st_1000= 94.80% 2_gsl_2nd_1000 =0.00% 3_awl_570= 0.00%	1.27	67.92

Song ti-tle	Num-ber of tokens	Num-ber types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
					not in lists= 5.20%		
I won't Let You Go	356	92	79	25.84	1_gsl_1st_1000= 96.90% 2_gsl_2nd_1000 =0.80% 3_awl_570= 0.00% not in lists= 2.20%	1.44	83.68
Broken Strings	367	100	88	27.24	1_gsl_1st_1000= 93.50% 2_gsl_2nd_1000 =4.10% 3_awl_570= 0.30% not in lists= 2.20%	1.35	79.68
I'm Yours	390	153	132	39.23	1_gsl_1st_1000= 90.50% 2_gsl_2nd_1000 =4.90% 3_awl_570= 0.30% not in lists= 4.40%	2.01	88.87
Domino	427	99	92	23.18	1_gsl_1st_1000= 72.80%	1.85	104.86

Song ti-tle	Num-ber of tokens	Num-ber types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
					2_gsl_2nd_1000 =12.40% 3_awl_570= 1.20% not in lists= 13.60%		
Price Tag	492	154	134	31.30	1_gsl_1st_1000= 83.00% 2_gsl_2nd_1000 =4.30% 3_awl_570= 0.20% not in lists= 17.10%	2.37	120.26
Baby	439	137	116	31.20	1_gsl_1st_1000= 76.10% 2_gsl_2nd_1000 =14.40% 3_awl_570= 0.20% not in lists= 9.30%	2.07	116.07
Hot N Cold	461	93	84	20.17	1_gsl_1st_1000= 93.70% 2_gsl_2nd_1000 =1.50% 3_awl_570= 0.20% not in lists= 4.60%	2.00	103.76

Song ti-tle	Num-ber of tokens	Num-ber types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
Teenage Dream	430	116	107	26.97	1_gsl_1st_1000= 84.90% 2_gsl_2nd_1000 =8.40% 3_awl_570= 0.20% not in lists= 6.50%	1.91	104.47
Californ-nia girls	415	171	155	41.20	1_gsl_1st_1000= 75.20% 2_gsl_2nd_1000 =6.30% 3_awl_570= 1.00% not in lists= 17.60%	1.91	100.94
Tik Tok	538	148	138	27.50	1_gsl_1st_1000= 73.20% 2_gsl_2nd_1000 =6.30% 3_awl_570= 0.00% not in lists= 20.40%	2.3	250.81
Hung Up	541	80	68	14.78	1_gsl_1st_1000= 88.70% 2_gsl_2nd_1000 =8.90% 3_awl_570= 0.00%	2.65	145.12

Song ti-tle	Num-ber of tokens	Num-ber types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
					not in lists= 2.40%		
Let me love you	527	129	110	24.47	1_gsl_1st_1000= 85.60% 2_gsl_2nd_1000 =6.50% 3_awl_570= 1.30% not in lists= 6.60%	2.23	119.51
This Love	314	109	94	34.71	1_gsl_1st_1000= 90.80% 2_gsl_2nd_1000 =2.20% 3_awl_570= 0.00% not in lists= 7.00%	1.8	158.08
Sunday Morn-ing	299	110	100	36.78	1_gsl_1st_1000= 78.90% 2_gsl_2nd_1000 =6.40% 3_awl_570= 0.30% not in lists= 14.40%	1.95	73.69
Must Get Out	358	100	90	27.93	1_gsl_1st_1000= 90.20%	1.61	81.35

Song ti-tle	Num-ber of tokens	Num-ber types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
					2_gsl_2nd_1000 =5.60% 3_awl_570= 0.00% not in lists= 4.20%		
Won't Go Home Without You	344	86	83	25.00	1_gsl_1st_1000= 95.10% 2_gsl_2nd_1000 =3.80% 3_awl_570= 0.00% not in lists= 1.20%	1.38	83.37
Misery	429	110	94	25.64	1_gsl_1st_1000= 89.00% 2_gsl_2nd_1000 =2.80% 3_awl_570= 0.00% not in lists= 8.20%	1.91	110
Every-thing	305	99	86	32.45	1_gsl_1st_1000= 81.60% 2_gsl_2nd_1000 =3.60% 3_awl_570= 0.00% not in lists= 14.80%	1.89	79.02

Song ti-tle	Num-ber of tokens	Num-ber types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
Haven't Met you yet	402	114	99	28.35	1_gsl_1st_1000= 93.50% 2_gsl_2nd_1000 =1.20% 3_awl_570= 0.00% not in lists= 5.20%	1.91	92.21
You'll Always Find Your Way Back Home	466	123	108	26.39	1_gsl_1st_1000= 92.90% 2_gsl_2nd_1000 =3.90% 3_awl_570= 0.60% not in lists= 2.60%	2.1	117.86
Let's Get Crazy	322	104	93	32.29	1_gsl_1st_1000= 78.30% 2_gsl_2nd_1000 =7.10% 3_awl_570= 0.90% not in lists= 13.70%	2.3	112.94
Rock-star	341	120	105	35.19	1_gsl_1st_1000= 78.30% 2_gsl_2nd_1000 =6.20% 3_awl_570= 0.00%	2.65	104.91

Song title	Number of tokens	Number types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
					not in lists= 15.50%		
So Sick	246	109	96	44.30	1_gsl_1st_1000= 87.00% 2_gsl_2nd_1000 =6.50% 3_awl_570= 0.00% not in lists= 6.50%	1.11	63.38
Miss Independent	451	114	103	25.27	1_gsl_1st_1000= 81.60% 2_gsl_2nd_1000 =1.10% 3_awl_570= 0.20% not in lists= 17.10%	2.13	108.36
Closer	406	72	65	17.73	1_gsl_1st_1000= 96.60% 2_gsl_2nd_1000 =2.70% 3_awl_570= 0.00% not in lists= 0.70%	1.72	90.5
One in A Million	517	126	102	24.37	1_gsl_1st_1000= 91.50%	2.3	115.06

Song title	Number of tokens	Number types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
					2_gsl_2nd_1000 =4.10% 3_awl_570= 0.00% not in lists= 4.40%		
What Makes You Beautiful	474	94	81	19.83	1_gsl_1st_1000= 87.30% 2_gsl_2nd_1000 =1.70% 3_awl_570= 0.20% not in lists= 10.80%	2.11	119.7
Good Life	454	125	108	27.53	1_gsl_1st_1000= 90.70% 2_gsl_2nd_1000 =3.30% 3_awl_570= 0.20% not in lists= 5.70%	2.76	101.73
Feel	248	87	77	35.08	1_gsl_1st_1000= 91.50% 2_gsl_2nd_1000 =1.60% 3_awl_570= 1.60% not in lists= 5.20%	1.25	53.48

Song title	Number of tokens	Number types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
Shut Up	919	193	172	21.00	1_gsl_1st_1000= 79.70% 2_gsl_2nd_1000 =13.60% 3_awl_570= 0.30% not in lists= 6.40%	3.24	181.62
Where is the Love?	688	247	226	35.90	1_gsl_1st_1000= 84.30% 2_gsl_2nd_1000 =3.10% 3_awl_570= 1.90% not in lists= 10.80%	2.85	162.75
I Gotta Feeling	674	111	105	16.46	1_gsl_1st_1000= 84.40% 2_gsl_2nd_1000 =6.40% 3_awl_570= 1.00% not in lists= 8.20%	2.28	123.72
Pictures of You	329	99	88	30.09	1_gsl_1st_1000= 91.50% 2_gsl_2nd_1000 =6.40% 3_awl_570= 1.00%	1.98	101.87

Song title	Number of tokens	Number types	Head word count	STTR	Word-List	Speech rate (wps)	Mean speed (wpm)
					not in lists= 2.10%		
Without You	200	60	52	30.00	1_gsl_1st_1000= 94.50% 2_gsl_2nd_1000 =2.50% 3_awl_570= 0.00% not in lists= 3.00%	0.95	52.21

Appendix B

Table B1: *Musical Analysis of Pop Song Lyrics*

Song title	**Length of the song (min:sec)**	**Tempo (BMP)**	**To-nality**	**Bar**	**Range**	**Instrumen-tation**	**Structure of the song**
Here With-out You	3:59	73.0	D	4/4	F#3-D5	(a)voice (b) a-coustic guitar (c)bass guitar (d) drums (e)backing vocal (f) keyboard/ piano	(a)intro (b) verse (c)chorus (d) verse (e)chorus (f) bridge (g) chorus (h) Outro
If I Ain't Got You	3:44	119.5	G	3/4	E3- C#5	(a)voice (b) piano (c) strings (i.e. violins and cellos) (d) bass (e) drums (f) guitar (g) back-ground vo-cals	(a) vers 1 (b) pre-chorus (c) chorus (d) vers 2 (e) pre-chorus (f) chorus (g) bridge (h) chorus (i) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
One Day in Your Life	3:28	119.4	F#m	4/4	A3- E5	(a)voice (b) piano (c) guitar (d) bass (e) drums (f) synthesi-zers (strings)	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Sweet Dreams	3:30	122.3	Em	4/4	D4- E5	(a)voice (b) syn-thesizers (key-boards) (c)guitars (d) bass (e) drums (f) vocal lay-ering effects	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Beauti-ful Liar	3:27	91.4	Cm	4/4	D4- E5	(a)voice (b) syn-thesizers (key-boards) (c)guitars (d) bass	(a) intro (b) verse 1 (c) chorus (d) verse 2 (e) chorus (f)bridge

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(e) drums (f) percus-sion (g) strings (h) back-ground vo-cals	(g) chorus (h) outro
Just the Way You are	3:40	109.2	F	4/4	B3- G#5	(a)voice (b) piano/ keyboards (c)guitars (d) bass (e) drums (f) synthesi-zers (g) strings (h) back-ground vo-cals	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Count on Me	3:18	88.9	C	4/4	D4- G5	(a)voice (b) a-coustic guitar (c)piano/ keyboards (d) percus-sion (e) strings	(a) intro (b) verse 1 (c) chorus (d) verse 2 (e) chorus (f)bridge (g) chorus (h) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(f) back-ground vo-cals	
Dan-gerous	2:58	116.2	Em	4/4	A3- D5	(a)voice (b) syn-thesizers (key-boards) (c)guitars (d) bass (e) drums (f) electronic effects (e.g. sweeps, fil-ters) (g) vocal processing (e.g. reverb, pitch modu-lation)	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Au Re-voir	3:08	127.9	Cm	4/4	G3- E5	(a)voice (b) syn-thesizers (key-boards) (c)guitars (d) bass (e) drums	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(f) electronic effects (e.g. sweeps, fil-ters) (g) vocal processing (e.g. reverb, pitch modu-lation)	(g) chorus (h) bridge (i) chorus (j) outro
I'm Alive	3:31	101.6	G	4/4	G3- A5	(a)voice (b) guitars (c) bass (d) drums (e) key-boards/ pi-ano (f) orchestral elements (strings) (g) synthesi-zers (h) backing vocals	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
For-ever	4:37	120.2	C#	4/4	G4- B5	(a)voice (b) guitars (c) bass (d) drums (e) key-boards/ pi-ano (f) electronic effects (e.g. sweeps, fil-ters) (g) vocal layering (h) auto-tune	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Ain't no Other Man	3:49	127.9	F#m	4/4	G#3- E5	(a)voice (b) guitars (c) bass (d) drums (e) key-boards/ pi-ano (f) percus-sion (g) horns (brass sec-tion) (h) backing vocals (addi-	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						tional lay-ers)	
Viva la Vida	4:03	128.2	Ab	4/4	B3- D5	(a)voice (b) electric guitars (c) bass (d) percus-sion (e) key-boards/ pi-ano (f) choir (g) orches-tral instru-ments (vio-lins, cellos, trumpets, trombones, flutes, clari-nets)	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) instrumen-tal section (j) chorus (k) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
This is Me	3:08	121.8	G	4/4	G3- B4	(a)voice (b) guitars (c) bass (d) drums (e) key-boards/ pi-ano (f) strings (g) backing vocals	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) climax (j) chorus (k) outro
Lights	4:02	120.9	B	4/4	A3- D5	(a)voice (b) elec-tronic ef-fects (e.g. sweeps, filters) (c)bass (d) drums (e) synthesi-zer (key-boards) (f) backing vocals	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
Right Round	3:23	125.0	C#m	4/4	C#4- F#5	(a)voice (b) guitars (c) bass (d) drums (e) synthesizer (keyboards) (f) electronic effects (e.g. sweeps, filters) (g) backing vocals (vocal layers) (h) samples (of the original song)	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i)chorus (j)outro
What I've Been Looking for	2:00	140.3	A	4/4	E3- G4	(a)voice (b) guitars (c)bass (d) drums (e) piano/ keyboards (f) backing vocals	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i)chorus (j)outro

Song title	**Length of the song (min:sec)**	**Tempo (BMP)**	**To-nality**	**Bar**	**Range**	**Instrumen-tation**	**Structure of the song**
What Time is It?	3:18	116.1	A	4/4	A3- B4	(a)voice (b) guitars (c)bass (d) drums (e) piano/ keyboards (f) backing vocals	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
I want It All	4:37	143.4	B	4/4	A3- A4	(a)voice (b) guitars (c)brass section (trumpets and trombones) (d) drums (e) piano/ keyboards (f) strings (g) backing vocals (h) orchestral elements	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
We're All in This To-gether	3:51	116.1	E	4/4	B3- D5	(a)voice (b) drums (c)guitars (d) bass (e) piano/ keyboards (f) brass sec-tions (trum-pets and trombones) (g) backing vocals (h) percus-sion	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
High School Musi-cal	3:51	116.4	B	4/4	E3- B4	(a) voice (b) drum s (c) guitar s (d) pi-ano/ key-boards (e) bass (f)brass sec-tion (trumpets and trom-bones)	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(g) backing vocals (h) percussions	
You Give Me Something	3:32	80.4	E	4/4	B3- E5	(a) voice (b) acoustic guitar (c) electric guitar (d) bass (e) drums (f)piano/ keyboards (g) strings (h) backing vocals	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f)pre-chorus (g) chorus (h) bridge (i)chorus (j)outro
I won't Let You Go	3:48	105.6	D	4/4	B3- D5	(a) voice (b) acoustic guitar (c) bass	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(d) drums (e) piano/ keyboards (f) strings (g) backing vocals	(f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Broken Strings	4:13	111.9	Em	4/4	B3- G5	(a) voice (b) acoustic guitar (c) bass (d) drums (e) piano/ keyboards (f) strings (g) backing vocals	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
I'm Yours	4:01	151.4	B	4/4	B3- D5	(a) voice (b) acoustic guitar (c) bass	(a) intro (b) verse 1 (c) pre-chorus (d) chorus

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(d) drums/ percus-sion (e) uku-lele (f) backing vocals	(e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Dom-ino	3:50	127.1	C#	4/4	E3- G#5	(a) voice (b) syn-thesizers (key-boards) (c) drums (d) bass (e) guitars (f) backing vocals (g) per-cussion	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Price Tag	3:44	117.8	B	4/4	G3- B4	(a) voice (b) a-coustic guitar (c) drums (d) bass	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(e) syn-thesizers (key-boards) (f) backing vocals (g) brass section	(g) chorus (h) bridge (i) chorus (j) outro
Baby	3:34	129.9	C#	4/4	A3- C#5	(a) voice (b) syn-thesizers (key-boards) (c) drums (d) bass (e) guitars (f) backing vocals (g) per-cussion	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Hot N Cold	3:38	132.8	G	4/4	A3- E5	(a) voice (b) syn-thesizers (key-boards)	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(c) drums (d) bass (e) guitars (f) backing vocals (g) per-cussion	(f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Teen-age Dream	3:48	120.0	B	4/4	A3- D5	(a) voice (b) syn-thesizers (key-boards) (c) drums (d) bass (e) guitars (f) backing vocals (g) per-cussion	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Cali-fornia girls	3:53	125.1	G	4/4	D4- F#5	(a) voice (b) syn-thesizers (key-boards)	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(c) drums (d) bass (e) guitars (f) backing vocals (g) per-cussion	(e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Tik Tok	3:21	120.2	Dm	4/4	D4- D5	(a) voice (b) syn-thesizers (key-boards) (c) drums (d) bass (e) guitar (f) backing vocals (g) per-cussion (h) auto-tune effects	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
Hung Up	3:23	125.7	C#m	4/4	B3- D5	(a) voice (b) syn-thesizers (key-boards) (c) drums (d) bass (e) string sample (f) backing vocals (g) per-cussion	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Let me love you	4:09	94.2	G	4/4	E4- B5	(a) voice (b) piano (key-boards) (c) rhyth-mic ele-ments (i.e. drum beats, bassline) (d) syn-thesizers (e) guitar (f) backing vocals	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	**Length of the song (min:sec)**	**Tempo (BMP)**	**To-nality**	**Bar**	**Range**	**Instrumen-tation**	**Structure of the song**
This Love	3:25	94.5	C	4/4	D4- G5	(a) voice (b) piano (key-boards) (c) bass (d) guitar (e) drums (f) backing vocals	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Sunday Morning	4:01	87.0	C	4/4	B3- E5	(a) voice (b) piano (key-boards) (c) bass (d) guitar (e) drums (f) backing vocals	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Must Get Out	3:56	96.7	C#m	4/4	B3- F#5	(a) voice (b) piano (key-boards) (c) bass	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(d) a-coustic guitar (e) electr onic guitar (f) drums (g) ba-cking vo-cals	(f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Won't Go Home With-out You	3:51	109.7	C	4/4	A3- D5	(a) voice (b) piano (key-boards) (c) bass (d) a-coustic guitar (e) electr onic guitar (f) drums (g) ba-cking vo-cals	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
Misery	3:30	102.7	C	4/4	D4- A5	(a) voice (b) guitar (c) bass (d) drums (e) syn-thesizers (key-boards) (f) backing voice	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Every-thing	3:25	123.1	E	4/4	B3- D5	(a) voice (b) brass instru-ments (c) bass (d) drums (e) piano (key-boards) (f) backing voice (g) strings (h) guitars	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
Ha-ven't Met you yet	4:04	122.6	B♭	12/8	A3- D5	(a) voice (b) pi-ano/ key-boards (c) drums (d) bass (e) brass instru-ments (f) back-ground vocals (g) guitar	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
You'll Always Find Your Way Back Home	3:45	153.8	A	4/4	E3- A4	(a) voice (b) a-coustic guitar (c) drums (d) bass guitar (e) electr ic guitar (f) key-boards/ piano (g) strings	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(h) backing vocals	
Let's Get Crazy	2:33	125.5	E	4/4	B3- E5	(a) voice (b) synthesizers (keyboards) (c) drums (d) bass (e) electric guitar	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Rock-star	2:59	108.1	G	2/4	E3- A4	(a) voice (b) acoustic guitar (c) drums (d) bass guitar (e) electric guitar	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(f) key-boards/ piano (g) strings (h) ba-cking vo-cals	
So Sick	3:33	94.7	C#m	4/4	B3- F#5	(a) voice (b) pi-ano/ key-boards (c) drums (d) Bass (e) syn-thesizer	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) fade-out
Miss Inde-pend-ent	3:52	114.9	E	4/4	G3- B4	(a) voice (b) drums (c) bass (d) syn-thesizers/ key-boards (e) guitar	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
							(i) chorus (j) outro
Closer	3:56	126.3	D	4/4	C4- B5	(a) voice (b) guitar (c) bass (d) drums (e) Synthesizer/ keyboards	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
One in A Million	4:03	99.8	B	4/4	G#3- A5	(a) voice (b) bass (c) drums (d) synthesizers/ keyboards	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) fade-out

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
What Makes You Beauti-ful	3:26	125.7	E	4/4	D4- A5	(a) voice (b) a-coustic guitar (c) electr ic guitar (d) drum s (e) bass (f) synthesi-zers	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Good Life	4:13	127.7	D	4/4	B3- D5	(a) voice (b) string s (c) syn-thesizers (d) key-boards/ piano (e) bass (f) drums (g) a-coustic guitar	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
Feel	4:27	133.1	G	4/4	A3- E5	(a) piano (b) drums (c) bass (d) electric guitar (e) strings (f) synthesi-zers (g) Voice	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Shut Up	4:56	112.8	F#m	4/4	F#3- G5	(a) drum machine (b) syn-thesizers (c) bass (d) Voice (e) Scrat-ches/ turntable effects	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Where is the Love?	4:00	93.7	F#	4/4	F#3- C#5	(a) drum machine (b) pi-ano/ key-boards (c) bass	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2

Song title	Length of the song (min:sec)	Tempo (BMP)	To-nality	Bar	Range	Instrumen-tation	Structure of the song
						(d) syn-thesizers (e) Voice (f) strings	(f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
I Gotta Feel-ing	4:50	128.2	C#	4/4	F#3- A4	(a) drum machine (b) syn-thesizers (c) bass (d) voice (e) synth effects (f) strings	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) outro
Pic-tures of You	3:12	104.5	A	4/4	F#3- B4	(a) drums (b) bass (c) guitar (d) key-boards/ piano (e) strings (f) voice	(a) intro (b) verse 1 (c) pre-cho-rus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) fade-out

Song title	**Length of the song (min:sec)**	**Tempo (BMP)**	**To-nality**	**Bar**	**Range**	**Instrumen-tation**	**Structure of the song**
With-out You	3:28	128.1	G	4/4	G3- A5	(a) syn-thesizers (b) drum machine (c) bass (d) voice (e) effects (f) strings	(a) intro (b) verse 1 (c) pre-chorus (d) chorus (e) verse 2 (f) pre-chorus (g) chorus (h) bridge (i) chorus (j) fade-out

Appendix C

Table C1: *Word Types, Headwords, and Frequency Counts in the Corpus*

Type	Headword	Count
you	you	1134
I	I	1058
the	the	662
it	it	529
and	and	447
t	not	437
s	be	421
to	to	375
me	i	341
oh	oh	305
a	a	301
we	we	284
that	this	283
m	m	249
re	be	248
up	up	239
can	can	227
my	i	223
yeah	yeah	219
your	you	215
on	on	203
just	just	201

Type	Headword	Count
be	be	193
baby	baby	180
in	in	180
is	be	178
love	love	177
all	all	171
so	so	167
of	of	163
let	let	156
don	do	155
do	do	150
but	but	140
no	no	140
know	know	134
this	this	130
got	get	129
when	when	123
want	want	112
like	like	111
what	what	107
down	down	104
there	there	101
ll	will	100
go	go	98

Type	Headword	Count
one	one	98
for	for	98
ooh	ooh	98
ever	ever	96
ain	ain	95
time	time	94
now	now	93
shut	shut	90
stop	stop	88
out	out	86
get	get	85
good	good	83
way	way	82
cause	cause	74
right	right	73
not	not	73
make	make	69
are	be	68
she	she	67
life	life	66
night	night	66
tonight	tonight	65
say	say	64
come	come	63

Type	Headword	Count
her	she	63
with	with	62
won	win	62
see	see	62
about	about	60
world	world	60
have	have	58
every	every	58
gonna	gonna	56
our	we	55
why	why	53
lights	light	53
girl	girl	52
back	back	52
never	never	49
feel	feel	49
if	if	47
could	could	47
ve	have	46
then	then	46
take	take	44
need	need	44
without	without	43
la	la	43

Type	Headword	Count
really	really	41
heart	heart	41
au	au	41
home	home	41
wanna	wanna	40
give	give	40
here	here	39
thing	thing	39
turn	turn	39
other	other	39
where	where	39
or	or	38
us	we	38
nothing	no	38
beautiful	beauty	38
more	more	38
look	look	37
some	some	37
crazy	crazy	37
forever	forever	36
too	too	36
only	only	35
money	money	35
together	together	34

Type	Headword	Count
hey	hullo	33
everything	every	33
day	day	33
little	little	33
at	at	32
been	be	32
away	away	31
who	who	31
always	always	31
best	best	31
from	from	30
dream	dream	30
whoa	whoa	30
was	be	30
waiting	wait	30
slowly	slow	30
people	people	29
show	show	29
gotta	gotta	29
they	they	29
dance	dance	29
find	find	28
na	na	28
than	than	27

Type	Headword	Count
better	best	26
by	by	26
around	around	26
change	change	26
light	light	25
something	some	25
before	before	25
how	how	25
d	d	25
round	round	25
man	man	25
school	school	25
had	have	24
call	call	24
believe	believe	24
pictures	picture	24
high	high	23
star	star	23
much	much	23
think	think	22
said	say	22
am	be	22
goes	go	22
through	through	22

Type	Headword	Count
hung	hang	22
chance	chance	21
real	real	21
things	thing	21
alone	alone	21
myself	I	20
calling	call	20
still	still	20
mind	mind	20
goodbye	good	20
head	head	20
hold	hold	20
tell	tell	20
fight	fight	20
bye	bye	20
feeling	feel	20
party	party	20
everybody	every	19
hear	hear	19
keep	keep	19
as	as	19
live	live	19
closer	close	19
hard	hard	18

Type	Headword	Count
will	will	18
mine	I	18
talking	talk	18
rock	rock	18
woo	woo	18
work	work	18
miss	miss	17
ha	ha	17
gone	go	17
friends	friend	17
control	control	17
revoir	revoir	17
leave	leave	17
cry	cry	16
break	break	16
dancing	dance	16
over	over	16
has	have	16
inside	inside	15
off	off	15
eyes	eye	15
found	find	15
start	start	15
wrong	wrong	15

Type	Headword	Count
made	make	15
them	they	15
hand	hand	15
would	would	15
kind	kind	15
bad	bad	15
mmm	mmm	15
even	even	14
ay	ay	14
hair	hair	14
own	own	14
goin	goin	14
musical	music	14
try	try	14
else	else	13
everyone	every	13
shine	shine	13
skin	skin	13
hands	hand	13
sing	sing	13
fly	fly	13
times	time	13
into	into	13
lies	lie	13

Type	Headword	Count
forget	forget	13
true	true	13
makes	make	13
tired	tire	13
should	should	12
wake	wake	12
worth	worth	12
slow	slow	12
touch	touch	12
spin	spin	12
city	city	12
might	might	12
independent	independent	12
sometimes	some	11
damn	damn	11
someday	someday	11
hot	hot	11
thought	think	11
alright	alright	11
til	til	11
reason	reason	11
boy	boy	11
supposed	suppose	11
fall	fall	11

Type	Headword	Count
late	late	11
truth	true	11
next	next	11
last	last	11
gets	get	11
going	go	11
price	price	11
put	put	10
California	California	10
same	same	10
dreams	dream	10
done	do	10
new	new	10
sure	sure	10
remind	remind	10
part	part	10
nobody	no	10
yes	yes	10
again	again	10
yourself	you	10
two	two	10
alive	alive	10
rest	rest	10
ma	ma	10

Type	Headword	Count
an	a	10
stand	stand	10
something	something	10
does	do	10
style	style	10
whatever	what	10
enough	enough	10
please	please	10
yours	you	10
fed	fed	10
may	may	10
understand	understand	10

Appendix D

Table D1: *Categorization of Words in the Corpus*

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
you	1134	baby	180	style	10	yeah	219
i	1058	shut	90	finally	7	ooh	98
the	662	tonight	65	fee	6	ain	95
it	529	hey	33	selection	6	gonna	56
and	447	slowly	30	drama	4	la	43
t	437	dance	29	undenia-ble	3	au	41
s	421	dancing	16	highlight	3	wanna	40
to	375	inside	15	anticipa-tion	3	crazy	37
me	341	hair	14	discrimi-nate	2	forever	36
oh	305	tired	13	role	2	whoa	30
a	301	skin	13	contact	2	gotta	29
we	284	spin	12	tension	2	na	28
that	283	slow	12	tense	2	bye	20
m	249	wake	12	potential	2	woo	18
re	248	alive	10	stressed	1	revoir	17
up	239	remind	10	criteria	1	ha	17
can	227	clock	9	images	1	mmm	15
my	223	clothes	9	negative	1	goin	14
your	215	thank	9	media	1	ay	14

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
on	203	shout	8	deny	1	some-day	11
just	201	kick	7	visions	1	damn	11
be	193	dirty	7	chemical	1	til	11
in	180	fun	7	demon-strate	1	alright	11
is	178	kiss	7	generates	1	fed	10
love	177	guess	7	overseas	1	califor-nia	10
all	171	hello	7	tradition	1	some-thin	10
so	167	tight	6	transition	1	ma	10
of	163	hurts	6	couples	1	tag	9
let	156	bit	6	mental	1	uh	9
don	155	exactly	6	insecure	1	night-mare	9
do	150	double	6	involved	1	boss	8
no	140	wings	6	trace	1	tryin	8
but	140	lonely	6	plus	1	gurls	8
know	134	swing	5	sex	1	bling	8
this	130	jump	5	energy	1	ba	8
got	129	fooling	5	item	1	ching	8
when	123	taste	5	guarantee	1	cha	8
want	112	radio	5	interven-tion	1	cele-brate	8

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
like	111	spell	4	convince	1	sum-mer-time	8
what	107	sick	4	maximum	1	bout	8
down	104	phone	4	couple	1	kinda	8
there	101	worst	4	revolu-tionaries	1	ah	8
ll	100	hesitate	4	predicta-ble	1	hoo	7
for	98	strings	4	temporary	1	jeans	7
one	98	hiding	4	positive	1	teen-age	7
go	98	bells	4	define	1	livin	7
ever	96	sand	4	physical	1	pop	7
time	94	beat	4			woah	7
now	93	bless	4			amaz-ing	7
stop	88	ice	4			tok	6
out	86	cool	4			tik	6
get	85	tongue	4			breaki n	6
good	83	melting	4			dom-ino	6
way	82	sad	4			gon	6
cause	74	hurt	4			scared	6
not	73	kissed	4			shakira	6

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
right	73	guide	4			be-yoncé	6
make	69	diamond	4			fame	6
are	68	waste	3			dyin	5
she	67	confess	3			kid	5
night	66	flat	3			dawn	5
life	66	typical	3			toll	5
say	64	excuses	3			beach	5
her	63	comfort	3			losin	5
come	63	bones	3			gettin	5
see	62	deserve	3			wild-cats	5
won	62	worry	3			scream	5
with	62	toes	3			nothin	5
world	60	hit	3			feelin	5
about	60	lock	3			hope-lessly	4
every	58	fierce	3			bull-shit	4
have	58	melt	3			over-whelmed	4
our	55	worse	3			flip	4
why	53	reviews	3			bikinis	4
lights	53	loud	3			heels	4

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
back	52	aloud	3			york	4
girl	52	honest	3			vaca-tion	4
feel	49	shield	3			throwin	4
never	49	feet	3			pole	4
could	47	breathe	3			mirror	4
if	47	blinded	3			badass	4
then	46	mistake	3			guy	4
ve	46	stuck	3			planet	4
need	44	forgive	3			sayin	4
take	44	floating	3			okay	4
without	43	guilty	3			hangin	4
home	41	pinch	3			super-ficial	4
heart	41	perfect	3			smash	3
really	41	diamonds	3			ques-tionin	3
give	40	vain	2			guid-ance	3
where	39	roof	2			hell	3
other	39	cup	2			veins	3
turn	39	preach	2			desper-ately	3
thing	39	practice	2			cryin	3

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
here	39	hate	2			doo	3
us	38	quick	2			cham-pion	3
or	38	complain	2			snow-board	3
more	38	airplanes	2			prac-ticing	3
beautiful	38	invitation	2			chi	3
nothing	38	grace	2			tai	3
some	37	weight	2			smart	3
look	37	awake	2			chase	3
too	36	drawer	2			misery	3
money	35	weather	2			popsi-cle	3
only	35	steal	2			dukes	3
together	34	rain	2			daisy	3
little	33	deserves	2			lalalala lalalala	3
day	33	police	2			yah	3
every-thing	33	phones	2			givin	3
been	32	regrets	2			paris	3
at	32	woke	2			glam	3
best	31	drum	2			lovin	3
always	31	breathing	2			ya	3

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
who	31	smoke	2			makin	3
away	31	raining	2			mis-sionar-ies	3
waiting	30	breath	2			choirs	3
from	30	fate	2			cavalry	3
was	30	compli-cate	2			roman	3
dream	30	hall	2			jerusa-lem	3
they	29	imagine	2			tellin	3
show	29	club	2			lovers	3
people	29	gun	2			rhythm	3
find	28	fan	2			drift	3
than	27	storm	2			saint	3
change	26	noises	2			movie	3
around	26	apart	2			blah	3
by	26	worries	2			karma	3
better	26	funny	2			tov	2
school	25	push	2			mazel	2
man	25	border	2			sofa	2
something	25	blame	2			wo	2
light	25	ashamed	2			cheek	2
round	25	pain	2			killin	2

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
d	25	wrap	2			yap-ping	2
how	25	rains	2			yell	2
before	25	blind	2			divi-dends	2
pictures	24	band	2			colo-rado	2
believe	24	blessed	2			china	2
call	24	journey	2			naaaa	2
had	24	swear	2			mmmh	2
star	23	climb	1			shyin	2
high	23	title	1			missin	2
much	23	stolen	1			seein	2
hung	22	govern-mental	1			im-press	2
through	22	blocked	1			smarts	2
goes	22	cures	1			super-star	2
am	22	praying	1			ayy	2
said	22	infor-mation	1			dresser	2
think	22	selfish-ness	1			fum-bling	2
alone	21	rug	1			fistful	2
real	21	swept	1			doin	2

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
chance	21	lungs	1			tick	2
things	21	straight	1			po	2
party	20	anger	1			junk	2
feeling	20	madness	1			crunk	2
calling	20	bound	1			em	2
myself	20	attracted	1			pedi-cure	2
fight	20	fools	1			talkin	2
tell	20	tough	1			ass	2
hold	20	tour	1			jeep	2
head	20	lot	1			freak	2
goodbye	20	stuff	1			palm	2
mind	20	dined	1			valen-tine	2
still	20	wined	1			boring	2
every-body	19	hole	1			playin	2
closer	19	fool	1			quit	2
hear	19	regular	1			guitar	2
live	19	rat	1			spark-ing	2
as	19	model	1			bass	2
keep	19	proud	1			boom-ing	2
work	18	nails	1			sexy	2

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
rock	18	reminds	1			chas-ing	2
talking	18	nice	1			lookin	2
mine	18	extra	1			london	2
will	18	coura-geous	1			jet	2
hard	18	luck	1			cham-pions	2
miss	17	track	1			takin	2
control	17	mystery	1			outta	2
friends	17	bell	1			amazin	2
gone	17	pretend	1			mama	2
leave	17	pool	1			lil	2
has	16	swim-ming	1			comin	2
over	16	confused	1			dough	2
break	16	mistaken	1			swag-ger	2
cry	16	mixes	1			peter	2
bad	15	bend	1			pillars	2
off	15	crushed	1			honey	2
wrong	15	mend	1			undone	2
start	15	patiently	1			inter-twined	2

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
found	15	weaving	1			confi-dential	2
eyes	15	thread	1			appe-tizer	2
kind	15	needle	1			lullaby	2
would	15	outline	1			para-lyzed	1
hand	15	fingers	1			soar	1
them	15	twist	1			es-tranged	1
made	15	sinking	1			erase	1
try	14	repair	1			reign	1
musical	14	pretend-ing	1			boxers	1
own	14	satisfied	1			shakin	1
even	14	plane	1			lab	1
shine	13	whis-pered	1			drug	1
everyone	13	shame	1			crawl	1
else	13	stick	1			new-born	1
into	13	shirt	1			chaim	1
times	13	smelled	1			dancin	1
fly	13	hesitating	1			ani-mosity	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
sing	13	telephone	1			hu-manity	1
hands	13	pocket	1			yo	1
makes	13	plenty	1			cinema	1
true	13	bottle	1			kids	1
forget	13	teeth	1			bacte-ria	1
lies	13	brush	1			infect-ing	1
independ-ent	12	creep	1			fol-lowin	1
should	12	necks	1			under-cover	1
might	12	juice	1			thy	1
city	12	wet	1			respec-tin	1
touch	12	warm	1			suf-ferin	1
worth	12	grass	1			ongoin	1
some-times	11	greetings	1			fillin	1
price	11	puzzle	1			gasses	1
hot	11	sheets	1			bombs	1
reason	11	compared	1			drop-pin	1
thought	11	sacrifice	1			insane	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
next	11	keys	1			gravi-tate	1
truth	11	garage	1			medi-tate	1
late	11	shades	1			irate	1
fall	11	mysteri-ous	1			kkk	1
supposed	11	beats	1			crips	1
boy	11	explode	1			bloods	1
going	11	pure	1			cia	1
gets	11	aim	1			usa	1
last	11	rid	1			terror-ists	1
under-stand	10	bending	1			terror-ism	1
may	10	checking	1			tryna	1
put	10	cracks	1			trauma	1
yours	10	melted	1			ad-dicted	1
please	10	ruins	1			mamas	1
enough	10	dust	1			lame	1
whatever	10	weak	1			routine	1
does	10	fading	1			quitter	1
stand	10	pouring	1			bick-erin	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
an	10	forward	1			yells	1
rest	10	louder	1			scream in	1
two	10	noise	1			mis-sion	1
yourself	10	tomorrow	1			changi n	1
again	10	excited	1			showin	1
yes	10	photo-graphs	1			lust	1
nobody	10	invita-tions	1			emo-tion	1
part	10	inviting	1			legiti-mate	1
sure	10	exciting	1			yellin	1
new	10	pride	1			boo	1
done	10	education	1			scare	1
dreams	10	shop	1			keen	1
same	10	models	1			abbey	1
father	9	bottles	1			pica-dilly	1
walking	9	bottom	1			es	1
moonlight	9	planes	1			ey	1
sunlight	9	bands	1			shy	1
running	9	rubber	1			ong	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
less	9	fans	1			ough	1
these	9	fade	1			en	1
top	9	mix	1			loot	1
sleep	9	shower	1			glow	1
used	9	pockets	1			nough	1
giving	9	precious	1			hood	1
floor	9	afraid	1			chick	1
run	9	hid	1			getter	1
taking	9	string	1			setter	1
count	9	plate	1			sin	1
smile	9	drums	1			sweet-est	1
laugh	9	wicked	1			any-thin	1
sweet	9	key	1			crib	1
line	9	sweep	1			thinkin	1
buy	9	hooked	1			effort-lessly	1
listen	9	entertain	1			mani-cured	1
play	9	hungry	1			anni-versary	1
face	9	hits	1			calen-dar	1
million	8	asleep	1			walkin	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
j	8	perfectly	1			ridicu-lous	1
coast	8	stole	1			dooo	1
met	8	prayers	1			rockin	1
anymore	8	rush	1			ock	1
falling	8	pearls	1			ro	1
spend	8	grateful	1			hall-way	1
win	8	dozen	1			un-wind	1
someone	8	search	1			dance-floor	1
once	8	magazine	1			maga-zine	1
morning	8	conta-gious	1			conta-gious	1
word	8	hometow n	1			homet own	1
making	8	hmm	1			hmm	1
bring	8	timing	1			timing	1
first	8	carousel	1			carou-sel	1
wait	8	cute	1			cute	1
knows	8	coy	1			coy	1
fire	8	desperate	1			desper-ate	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
answer	8	unspoken	1			unspo-ken	1
free	8	jagged	1			jagged	1
he	8	sway	1			sway	1
either	8	ohh	1			ohh	1
lost	8	aint	1			aint	1
close	8	mold	1			mold	1
many	8	shrouding	1			shroud ing	1
tears	8	fingertips	1			finger-tips	1
behind	8	hips	1			hips	1
well	8	appetite	1			appe-tite	1
maybe	8	feed	1			feed	1
songs	8	chaos	1			chaos	1
mean	8	oooh	1			oooh	1
whole	8	stare	1			stare	1
three	8	dime	1			dime	1
their	8	perfume	1			per-fume	1
y	7	tock	1			tock	1
certain	7	smack	1			smack	1
under	7	jagger	1			jagger	1
cold	7	mick	1			mick	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
broken	7	curb	1			curb	1
tried	7	linin	1			linin	1
known	7	dudes	1			dudes	1
future	7	beer	1			beer	1
until	7	tipsy	1			tipsy	1
looking	7	pullin	1			pullin	1
move	7	cds	1			cds	1
open	7	toppin	1			toppin	1
must	7	blowin	1			blowin	1
keeping	7	jack	1			jack	1
soul	7	grab	1			grab	1
front	7	diddy	1			diddy	1
dangerous	7	mornin	1			mornin	1
help	7	yeahh	1			yeahh	1
liar	7	ohhh	1			ohhh	1
him	7	represen-tin	1			repre-sentin	1
name	7	huh	1			huh	1
stay	7	lookie	1			lookie	1
air	7	katy	1			katy	1
long	7	queenie	1			queenie	1
stars	7	weenies	1			wee-nies	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
did	7	martinis	1			marti-nis	1
stronger	7	zucchinis	1			zucchi-nis	1
anything	7	bangin	1			bangin	1
different	7	home-boys	1			home-boys	1
its	7	venice	1			venice	1
wall	6	bait	1			bait	1
yet	6	buns	1			buns	1
haven	6	squeeze	1			squeez e	1
promise	6	tan	1			tan	1
sunday	6	toned	1			toned	1
protection	6	stereo	1			stereo	1
speakers	6	dogg	1			dogg	1
blow	6	doggy	1			doggy	1
girls	6	snoop	1			snoop	1
west	6	stilettos	1			stilet-tos	1
fix	6	peek	1			peek	1
ring	6	sneak	1			sneak	1
loved	6	gin	1			gin	1
learn	6	sippin	1			sippin	1
says	6	fort	1			fort	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
each	6	motel	1			motel	1
door	6	cali	1			cali	1
bigger	6	punch	1			punch	1
ready	6	makeup	1			makeup	1
walk	6	coaster	1			coaster	1
strong	6	bipolar	1			bipolar	1
stone	6	battery	1			battery	1
singing	6	sync	1			sync	1
upon	6	twins	1			twins	1
were	6	crypti-cally	1			crypti-cally	1
watch	6	overthink	1			overthink	1
music	6	bitch	1			bitch	1
god	6	pms	1			pms	1
reach	6	dazin	1			dazin	1
woman	6	play-ground	1			play-ground	1
die	6	skip	1			skip	1
words	6	starbucks	1			star-bucks	1
till	6	starstruck	1			star-struck	1
being	6	luda	1			luda	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
pleasure	6	pricetag	1			pricetag	1
cover	6	stumble	1			stum-ble	1
those	6	mars	1			mars	1
young	6	guitars	1			guitars	1
rings	6	stack	1			stack	1
hope	6	cash	1			cash	1
saw	6	obsessed	1			ob-sessed	1
car	5	hoes	1			hoes	1
letting	5	video	1			video	1
lifting	5	strum	1			strum	1
living	5	holly-wood	1			holly-wood	1
taken	5	glitter	1			glitter	1
care	5	vanities	1			vani-ties	1
comes	5	fogged	1			fogged	1
left	5	nibble	1			nibble	1
black	5	scooch	1			scooch	1
second	5	godfor-saken	1			god-for-saken	1
big	5	reckon	1			reckon	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
along	5	divine	1			divine	1
l	5	bestest	1			bestest	1
shows	5	chill	1			chill	1
white	5	bet	1			bet	1
summer	5	untrue	1			untrue	1
lives	5	tread	1			tread	1
talk	5	script	1			script	1
place	5	improvi-sation	1			im-provi-sation	1
piece	5	gradua-tion	1			gradu-ation	1
voice	5	figured	1			figured	1
far	5	celebra-tion	1			cele-bration	1
sound	5	bolly-wood	1			bolly-wood	1
king	5	moscow	1			mos-cow	1
blue	5	tokyo	1			tokyo	1
lady	5	aires	1			aires	1
ground	5	buenos	1			buenos	1
driving	5	sidney	1			sidney	1
above	5	toronto	1			toronto	1
set	5	rome	1			rome	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
telling	5	ali	1			ali	1
special	5	oprah	1			oprah	1
song	5	madison	1			madi-son	1
didn	5	broadway	1			broad-way	1
his	5	spotlight	1			spot-light	1
side	5	oscar	1			oscar	1
nowhere	5	sequels	1			sequels	1
coming	5	setters	1			setters	1
moment	5	celebri-ties	1			celeb-rities	1
very	5	maga-zines	1			maga-zines	1
happened	4	ovations	1			ova-tions	1
pull	4	paparazzi	1			papa-razzi	1
lose	4	backstage	1			back-stage	1
send	4	bouquets	1			bou-quets	1
ends	4	carpet	1			carpet	1
choice	4	carnegie	1			carne-gie	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
p	4	superstars	1			super-stars	1
fine	4	publisist	1			pub-lisist	1
sun	4	stylist	1			stylist	1
unforget-table	4	sharpay	1			sharpa y	1
between	4	audition	1			audi-tion	1
plans	4	wakin	1			wakin	1
cannot	4	romance	1			ro-mance	1
willing	4	movin	1			movin	1
step	4	chillin	1			chillin	1
matter	4	cartier	1			cartier	1
every-where	4	asses	1			asses	1
wants	4	watchin	1			watchi n	1
after	4	touchin	1			touchi n	1
house	4	poppin	1			poppin	1
wild	4	wearin	1			wearin	1
class	4	spendin	1			spendi n	1
moon	4	gopher	1			gopher	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
finds	4	holster	1			holster	1
past	4	wavin	1			wavin	1
brother	4	daze	1			daze	1
waited	4	cajun	1			cajun	1
couldn	4	blazin	1			blazin	1
sky	4	buildin	1			buildin	1
breaking	4	grands	1			grands	1
any	4	lin	1			lin	1
four	4	frank	1			frank	1
stops	4	benjamin	1			benja-min	1
trying	4	shawty	1			shawty	1
kill	4	goody	1			goody	1
ones	4	patrón	1			patrón	1
wish	4	platinum	1			plati-num	1
somebody	4	ballin	1			ballin	1
clouds	4	homies	1			homies	1
lay	4	jewelry	1			jew-elry	1
means	4	pirellis	1			pirellis	1
fortune	4	stoppin	1			stoppin	1
dreaming	4	shawties	1			shaw-ties	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
days	4	hop	1			hop	1
town	3	hee	1			hee	1
paint	3	over-thrown	1			over-thrown	1
ask	3	puppet	1			puppet	1
o	3	shattered	1			shat-tered	1
few	3	dice	1			dice	1
escape	3	ledge	1			ledge	1
unusual	3	mess	1			mess	1
laughs	3	releasin	1			re-leasin	1
dress	3	maybes	1			may-bes	1
war	3	ands	1			ands	1
wherever	3	ifs	1			ifs	1
possibility	3	gaze	1			gaze	1
wishing	3	angel	1			angel	1
killing	3	sendin	1			sendin	1
silence	3	rebels	1			rebels	1
thinking	3	melody	1			mel-ody	1
direction	3	ecstasy	1			ecstasy	1
instead	3	eternity	1			eter-nity	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
figure	3	irresisti-ble	1			irre-sistible	1
darkness	3	nah	1			nah	1
kept	3	masquer-ade	1			mas-quer-ade	1
stories	3	pretender	1			pre-tender	1
represent	3	believer	1			be-liever	1
fresh	3	turnin	1			turnin	1
boys	3	tossin	1			tossin	1
drunk	3	stares	1			stares	1
half	3	compli-ment	1			com-pli-ment	1
save	3	innocence	1			inno-cence	1
because	3	heart-break	1			heart-break	1
pay	3	tolerate	1			toler-ate	1
press	3	tattoo	1			tattoo	1
fit	3	fairytale	1			fair-ytale	1
lead	3	velvet	1			velvet	1

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
already	3	intimate	1			inti- mate	1
belong	3	inspira- tions	1			inspi- rations	1
paid	3	platter	1			platter	1
shot	3	roses	1			roses	1
missing	3	fountain	1			foun- tain	1
seems	3	wont	1			wont	1
though	3	overrated	1			over- rated	1
become	3	rollin	1			rollin	1
ruled	3						
explain	3						
field	3						
foreign	3						
sword	3						
ringing	3						
minute	3						
old	3						
crowd	3						
roll	3						
clear	3						
came	3						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
both	3						
sister	3						
mother	3						
trust	3						
another	3						
feels	3						
stage	3						
claim	3						
standing	3						
doubt	3						
biggest	3						
beside	3						
dark	3						
simple	3						
wouldn	3						
skies	3						
filled	3						
wonder	3						
meant	3						
full	3						
game	3						
anywhere	3						
heard	3						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
since	3						
saturday	2						
easy	2						
burn	2						
fill	2						
spreading	2						
secret	2						
children	2						
given	2						
years	2						
turns	2						
yesterday	2						
room	2						
presence	2						
working	2						
outside	2						
faster	2						
nation	2						
monday	2						
space	2						
near	2						
faith	2						
rather	2						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
shown	2						
everyday	2						
happen	2						
use	2						
forgot	2						
flower	2						
picture	2						
knew	2						
road	2						
looks	2						
type	2						
seem	2						
pounds	2						
build	2						
favorite	2						
most	2						
getting	2						
golden	2						
travel	2						
racing	2						
built	2						
heavy	2						
plain	2						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
changes	2						
street	2						
pieces	2						
whenever	2						
enjoy	2						
cloud	2						
saying	2						
ear	2						
short	2						
felt	2						
train	2						
playing	2						
turning	2						
broke	2						
remember	2						
bought	2						
water	2						
memories	2						
started	2						
wave	2						
arrived	2						
speaking	2						
square	2						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
gold	2						
red	2						
drop	2						
pressure	2						
having	2						
seen	2						
body	2						
plan	2						
number	2						
drink	2						
flowers	2						
ours	2						
places	2						
losing	2						
castles	2						
walls	2						
dead	2						
streets	2						
strength	2						
changed	2						
sense	2						
starts	2						
present	2						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
others	2						
told	2						
deep	2						
caught	2						
seat	2						
rules	2						
moving	2						
begun	2						
takes	2						
center	2						
lover	2						
crossed	2						
shoulder	2						
called	2						
middle	2						
shining	2						
scene	2						
walked	2						
death	2						
across	2						
thoughts	2						
bed	2						
sleepless	2						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
hour	2						
longer	2						
cars	2						
today	2						
fell	2						
gave	2						
carry	2						
honor	2						
wide	2						
truly	2						
share	2						
silver	2						
prove	2						
within	2						
power	2						
falls	2						
miles	2						
colder	2						
pretty	2						
older	2						
hundred	2						
accept	1						
believed	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
dry	1						
earth-quake	1						
scientists	1						
son	1						
soldier	1						
child	1						
story	1						
friday	1						
thursday	1						
wednes-day	1						
tuesday	1						
spaced	1						
ball	1						
unity	1						
leading	1						
under-standing	1						
lack	1						
equality	1						
fairness	1						
values	1						
act	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
minds	1						
main	1						
decisions	1						
youth	1						
nations	1						
peace	1						
strange	1						
ways	1						
operates	1						
works	1						
race	1						
useless	1						
week	1						
neighbors	1						
agree	1						
progress	1						
fast	1						
private	1						
reasons	1						
flew	1						
walks	1						
preparing	1						
language	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
speaks	1						
sit	1						
closes	1						
window	1						
happy	1						
address	1						
numbers	1						
names	1						
e	1						
c	1						
heads	1						
end	1						
mr	1						
shines	1						
bills	1						
herself	1						
memory	1						
th	1						
july	1						
marked	1						
months	1						
machine	1						
answering	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
hang	1						
notice	1						
meet	1						
ending	1						
rough	1						
single	1						
united	1						
fair	1						
somehow	1						
worked	1						
stopped	1						
lasts	1						
surprised	1						
outer	1						
august	1						
shaken	1						
com-pletely	1						
salty	1						
bleed	1						
deeper	1						
cuts	1						
letters	1						
wrote	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
perhaps	1						
remained	1						
asked	1						
runs	1						
circles	1						
eights	1						
branches	1						
forth	1						
gladly	1						
moments	1						
covers	1						
inch	1						
return	1						
controlled	1						
burning	1						
recognize	1						
nine	1						
ninety	1						
descrip-tion	1						
beauty	1						
quarter	1						
unless	1						
parties	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
glasses	1						
springs	1						
drives	1						
trees	1						
under-neath	1						
laying	1						
greener	1						
complete	1						
drove	1						
february	1						
brought	1						
ride	1						
roller	1						
case	1						
doctor	1						
speak	1						
weekend	1						
pound	1						
daily	1						
thirteen	1						
shake	1						
looked	1						
leaving	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
seconds	1						
six	1						
happiness	1						
blows	1						
low	1						
wasn	1						
unite	1						
paying	1						
acting	1						
serious	1						
sale	1						
seeing	1						
virtue	1						
seasons	1						
laughed	1						
drew	1						
glass	1						
clearer	1						
back-wards	1						
spending	1						
dear	1						
family	1						
doing	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
holding	1						
disap-peared	1						
wrongs	1						
anyway	1						
hours	1						
backs	1						
gotten	1						
impossi-ble	1						
took	1						
realize	1						
lived	1						
written	1						
learned	1						
limita-tions	1						
garden	1						
sold	1						
rose	1						
agent	1						
personal	1						
listening	1						
course	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
college	1						
dreamed	1						
proved	1						
soon	1						
sunshine	1						
loving	1						
feelings	1						
crown	1						
bank	1						
shoot	1						
poster	1						
wage	1						
hotter	1						
paper	1						
mouth	1						
women	1						
safe	1						
slept	1						
sleeping	1						
queen	1						
windows	1						
doors	1						
blew	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
wind	1						
salt	1						
discov-ered	1						
closed	1						
held	1						
enemy	1						
fear	1						
rise	1						
seas	1						
rule	1						
test	1						
passed	1						
talked	1						
needed	1						
cloudy	1						
moved	1						
eye	1						
matters	1						
level	1						
join	1						
speed	1						
spirits	1						
raising	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
flight	1						
spirit	1						
higher	1						
glad	1						
fishing	1						
limit	1						
sail	1						
sea	1						
while	1						
asks	1						
followed	1						
trusted	1						
suffer	1						
read	1						
desire	1						
played	1						
likes	1						
remain	1						
arms	1						
mention	1						
hopes	1						
nights	1						
midnight	1						

1_gsl_1st_1000	Count	2_gsl_2nd_1000	Count	3_awl_570	Count	Not in lists	Count
turned	1						
houses	1						
faces	1						
such	1						
cares	1						
promises	1						
bore	1						
disappear	1						
separate	1						
thousand	1						

Appendix E

Table E1: *Distribution of Parts of Speech Across Different Count Ranges*

Parts of speech	1_gsl_1st_1000	2_gsl_2nd_1000	3_awl_570	From 3_gsl_3rd_1000
Nouns	219	89	16	2
Verbs	152	85	10	35
Adjectives	70	63	10	13
Pronouns	26	0	0	0
Adverbs	3	10	0	3
Prepositions	14	1	0	3
Conjuctions	33	0	0	5
Interjections	10	5	0	17
N/A (Proper Nouns)	27	0	0	0
N/A (Numbers)	6	0	0	0
Total N of lexis	390	253	36	78
Total N of tokens	576	301	36	78

N/A stands for “not in previous categories”

Appendix F

Table F1: *Country of Origin of Singers in the Corpus*

Country	**N (32)**	**%**
USA	22	68.75
Great Britain	6	18.75
Non-native singers	1	3.13
Australia/New Zealand	0	0
Jamaica	0	0
South Africa	0	0
Unknown origin	0	0
Canada	3	9.38

Appendix G

Table G1: *Overview of Multi-Word Units with Lexical Count, CEFR Levels, Topics, and Units*

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Here Without You	(a) you (22) (b) I (20) (c) baby (9) (d) and (8) (e) me (8) (f) my (8) (g) the (8) (h) but (7)	(a) but you're still on my lonely mind (3) (b.1) I'm here without you, (baby) (6) (b.2) since the last time I saw your pretty face/ disappear now when I'm dreaming of your face (2) (c) I think about you, (baby) (3) (d) and I dream about you all the time (3) (e.1- f) but you're still with me in my dreams (3) (e.2) and tonight (girl) it's only you and me (3) (e.3) a hundred days have made me older/ a thousand lies have made me colder (2) (g) all the miles that separate/ the miles just keep rollin' (2)	A1/ A2 (lonely= B1)	Personal life: (a) holidays (b) weekend (c) summer (d) descriptions of people and things	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(i) 'm (7) (j) about (6)	(h) but I hope that it gets better as we go/ everything I know, and, everywhere I go (2) (i) b (j) c			
If I Ain't Got You	(a) you (42) (b) I (36) (c) if (19) (d) and (18) (e) get (18) (f) some (16) (g) want (15) (h) baby (14) (i) people (13) (j) for (12)	(a.1) got you (18) (a.2) thank you (6) (b. 1) I don't want (4) (b.2) I want (2) (c) if I (16) (e) a.1 (f.1) some people (13) (f.2) some people live (4) (f.3) some people live for (3) (g.1) some people want (6) (i) f.1, f.2, g.1 (j.1) thank you for (3)	A1/ A2	Personal life: - activities - holiday - description of people and things	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
One Day in Your Life	(a)you (27) (b)it (19) (c)day (14) (d)your (14) (e)in (13) (f) one (13) (g)life (12) (h)I (9) (i) could (6)	(a.1) you let (4) (a.2) you leave me (6) (a.3) find you (4) (b) leave it (6) (c) one day in your life (13) (d) c (e) c (f) maybe one day (4) (g) c (h) I know (2) (h.2) I'm stronger than before (4) (i.1) could you (6) (i.2) how could you (5)	A1/ A2	Job orientation: - activities - future plans - description of people and things - birthday	1 2 3 4 5
Sweet Dreams	(a)you (28) (b)I (24) (c)a (17) (d)be (13) (e)dream (12) (f) the (12) (g)lights (10) (h)nightmare (9)	(a.1) you're (10) (a.2) from you (7) (b) I don't (7) (d.1) you can be (3) (d.2) you could be (3) (e.1) a sweet dream (9) (e.2) what kind of dream is this? (3) (f) turn the lights on (10) (g) i (h) a beautiful nightmare (6)	A1/ A2	Job orientation: - future plans - holidays - school - weekend - activities - summer - illness	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(i) beautiful (9) (j) turn (10) (k)sweet (9) (l) wake up (8)	(i) k (j) i (k) e (l) wake up (8)			
Beautiful Liar	(a)the (15) (b)I (14) (c)not (12) (d)a (11) (e)it (11) (f) you (11) (g)we (9) (h)let (8) (i) about (7) (j) beautiful (7) (k)can (7) (l) liar (7) (m) worth (7) (n)have to (2) (o)tell me how (2)	(b.1) I know things about (1) (c) It's not worth (6) (e) it's (7) (g) can we live without(3) / we can (3) (h) let's (not) (6) (i) laugh about it (3) (j) a beautiful liar (7) (k)g (l) j (m) I'm worth it (1) (n) I have to (let go) (2) (o) tell me how (2)	A1/ A2 (worth = B1)	Job orientation: - describing people and things - school - shopping list - arrangement	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Just the Way You are	(a)you (19) (b)the (16) (c)are (´re) (14) (d)way (14) (e)just (10) (f) I (9) (g)her (7) (h)amazing (4) (i) and (4) (j) she (4) (k)so (3)	(a)the way you are (14) (b) a (10) (c) you're amazing (4) (d) a (e) a (f.1) I know (2) (f.2) what I see (2) (g.1) her eyes (2) (g.2) her hairs (2) (g.3) tell her (1) (g.4) I compliment her (g.5) I without her (h) c (j) she's so (3) (k) j	A1/ A2	Personal life: - describing people - activities - hobbies - holidays - birthday - weekend	1 2 3 4 5
Count on Me	(a) you (26) (b) I (18) (c) will (´ll) (13)	(a.1) you'll be there (3) (a.2) if you find (4) (a.3) you can count on me (4) (b.1) I'll be(7) (b.2) I'll be there (4) (b.3) I can (4) (b.4) I can count on you (4) (b.5) I know (3) (b.6) I need it (3) (c, d, e, g, h) a, b	A1/ A2	Personal life: - holidays - weekend - school - birthday - summer - hobbies - activities - describing people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(d) can (10) (e) count on (8) (f) are supposed to (8) (g) be (7) (h) there (6) (i)when (6) (j) made of (2)	 (f) what friends are supposed to do (3) (i.1) when I (3) (i.2) when we (2) (j) made of (2)		- future plans	
Dangerous	(a) I (18) (b) you (13) (c) am (´m) (11) (d) know (8) (e) your (8) (f) dangerous (7) (g) so (6) (h) my (5)	(a.1) I'm (11) (a.2) I'm out of control (4) (b) you're so dangerous (5) (b.2) you want (3) (c) a (d.1) I don't know how (2) (d.2) I know something (2) (e) your eyes (3) (f) b (g) b (h) my biggest mistake (3) (i) h	A1/ A2	Job orientation: - weekend - holidays - school - birthday - summer - hobbies - activities - describing people - future plans	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(i)mistake (3) (j)control (4) (k) blinded by (3) (l)give me (2)	(j) a (k) blinded by (3) (l) give me a break (2)			
Au Revoir	(a) you (24) (b) bye (18) (c) the (11) (d) are (´re) (9) (e) I (11) (f)show (7) (g) so (6) (h) be (5) (i) buy (5) (j) me (5)	(a) you (just) don't turn me on (3) (b) bye bye (12) (c.1) the next best movie star (3) (c.2) here's the simple truth (3) (d) you think you're something special (4) (e) I don't buy your show(5) (f.1) you wanna show (2) (g) so superficial (3) (h) you claim to be (3) (i) e (j) stop telling me lies (3)	A1/ A2	Job orientation: - holidays - weekend - school - birthday - summer - hobbies - activities - describing people - future plans	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
I'm Alive	(a) I (30) (b) you (18) (c) when (16) (d) me (12) (e) alive (9) (f) that (9) (g) am ('m) (8) (h) on (7) (i) get (6) (j) call (5) (k) fly (5) (l) God (2)	(a.1) when I (3) (a.2) I'm alive (7) (a.3) I feel (3) (a.4) I hear you breath (3) (b) you call on me (5) (c) when you (13) (d) you reach for me (4) (e) a (f) I know that (2) (g) a (h) b (i) I get wings to fly (5) (j) b (k) i (J) God knows that (2)	A1/ A2 (B1 with breath)	Personal life: - school - holidays - weekend - birthday - summer - hobbies - activities - describing people - future plans	1 2 3 4 5
Forever	(a) ever (b) forever (29) (c) you (21) (d) the (21) (e) is ('s) (14) (f) I (13) (g) it (12)	(a, b) forever, ever, ever (20) (c) let you (5) (d) the dance (7) (e) it's like (12) (f) I won't let you fall (3) (g) e (h.1) dance floor (8) (h.2) dance on (3)	A1/ A2	Personal life: - holidays - school - weekend - birthday - summer - hobbies - activities - future plans	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(h) dance (11) (i) one night (8) (j) around you (2)	(h.3) dance forever (3) (i) one night (8) (j) around you (2)			
Ain't no Other Man	(a) you (47) (b) no (28) (c) other (25) (d) man (18) (e) got (13) (f) are (´re) (11) (g) stand up (4) (h) do (2) (i) honey (2) (j) tell/ told (3)	(a.1) what you do (4)/what do you do (a.2) do you (4) (a.3) you got (13) (b.1) no other (24) (b.2) no other man (18) (c,d) b (e) a (f) you're (11) (g) can stand up (4) (h) do your thing (2) (i) honey (2) (j) tell/told your mother, your brother, your sister and your friends, and the other	A1/ A2	Personal life: - school - birthday - summer - future plans - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Viva la Vida	(a) I (19) (b) the (17) (c) my (14) (d) a (9) (e) in (6) (f) be (4) (g) for (4) (h) never (4) (i) a ringing (3) (j) an honest (3)	(a.1) I can't explain (3)/ I can (3) (a.2) I used to (3) (a.3) I hear bells (3) (a.4) when I rule/ruled the world (3) (b) a (c) be my mirror (3) (d) never an honest world (3) (e) in a foreign field (3) (f) c (g) for some reason (3) (h) d (i) a ringing (3) (j) an honest (3)	A1/ A2	Job orientation: - holidays - weekend - school - birthday - summer - future plans - trip to the country	1 2 3 4 5
This is Me	(a) I (33) (b) me (14) (c) this (12) (d) you (12)	(a.1) I'm supposed to be (9) (a.2) who I am (8) (a.3) who I want to be (4) (a.4) I need (4) (a.5) I want (4) (b.1) this is me/ real (11) (b.2) let the light shine on me (2) (c) b (d) find you (4)	A1/ A2	Personal life: - birthday - school - future plans - arrangement - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(e) is (12) (f) it (10) (g) am ('m) (9) (h) no (8)	(d.1) you're the voice I hear inside my head (2) (d.2) you're the missing piece I need (2) (e-f) it's time to let you know (2) (g) a (h.1) no more (4) (h.2) no way (4)			
Lights	(a) lights (40) (b) I (20) (c) callin g (18) (d) home (16) (e) you (12) (f) me (10) (g) when (10) (h) that (9) (i) show the (6) (j) stone you (6)	(a) lights (22) (b.1) I'm alone (6) (b.2) I'll tell myself that I'll be strong (2) (c) they're calling me home(6) (d) home (e.1) you shine (6) (e.2) you show (6) (f) stop me (6) (g) when I'm alone (2) (h) b (i) show the (6) (j) to stone you (6)	A1/ A2	Personal life: - activities - holidays - weekend - school - birthday - summer - future plans - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Right Round	(a) down (51) (b) you (34) (c) my (29) (d) go (26) (e) right (20) (f) round (20) (g) when (20) (h) I (18) (i) the (17) (j) is ('s) (13) (k) head (10)	(a) when you go down (25) (b) when you go (20) (c) my head (10) (d) it's going down (2) (g) b (h) I'm out of control/ outta control (2) (k) c (l) nothin' more beautiful to be found (4) (m) I watch her go down (4) (n) she got me (4) (o) throwin' my money around (6)	A1/ A2	Personal life: - activities - holidays - weekend - school - birthday - summer - hobbies - future plans	1 2 3 4 5
What I've Been Looking for	(a) do (21) (b) I (14) (c) you (13) (d) to (8)	(a) you do (4) (b.1) I want you to know (2) (b.2) I've never had someone (4) (b.3) what I've been looking for (2) (b.4) so lonely before I finally found (2) (c.1) like you (4)	A1/ A2	Personal life: - activities - holidays - weekend - school - birthday - summer - future plans	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(e) like (6) (f) so (6) (g) for (5) (h) good (5) (i) no (5) (j) feeling	(c.2) the way you do (2) (d) so good to be (3) (e) c (f) d (g) b (h) d (i) no one (3) (j) this feeling is like no other (2)		- arrangement - descriptions people	
What Time is It?	(a) it (36) (b) is (´s) (26) (c) time (24) (d) we (16) (e) what (1) (f) our (10) (g) come on (5) (h) let's (5) (i) party time (4) (j) school's out (4)	(a, b, c) what time is it? (14) (a.2) it's summertime (6) (a.3) say it loud (6) (d) we're (7) (e) a, b, c (f.1) it's our vacation (6) (f.2) the time of our lives (4) (g) come on (5) (h) let's (5) (i) party time (4) (j) school's out (4) (k) scream and scout (3)	A1/ A2	Education/school: - holidays - school - summer - hobbies - future plans	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(k) scream and scout (3)				
I want It All	(a) it (57) (b) I (56) (c) want (54) (d) you (28) (e) all (18) (f) better (7) (g) think bigger (2) (h) the world (4) (i) imagine (2)	(A, b, c) I want it (32) (a.2) it all (13) (d.1) you want it (8) (d.2) don't you see (2) (d.3) don't you want it (1) (e) a (f.1) bigger is better (2) (f.2) better is bigger (2) (f.3) that's better (2) (g) think bigger (2) (h) the world (4) (i) imagine (2)	A1/ A2	Job orientation: - activities - holidays - weekend - school - birthday - future plans	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
We're All in This Together	(a) we (52) (b) together (28) (c) are ('re) (19) (d) in (18) (e) all (17) (f) it (15) (g) is ('s) (15) (h) and (12) (i) come on (7) (j) dreams (3)	(a.1) once we know that we're all stars (3) (a.2) once we see there's a chance (2) (a.3) we make each other strong (2) (a.4) when we stand hand in hand (2) (a.5) alright, here we go (2) (a.6) when we reach (2) (b.1) together everyone (2) (b.2) we're all in this together (6) (b.3) together (28) (c) a (d) in this (10) (e) a (f.1) we can make it (2) (f.2) and we take it (2) (g) a (h) f (i) come on (7) (j) make our dreams come true (3)	A1/ A2	Job orientation & personal life: - activities - holidays - weekend - school - birthday - summer - future plans - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
High School Musical	(a) we (27) (b) the (23) (c) high (27) (d) school (27) (e) is ('s) (16) (f) musical (14) (g) it (13) (h) let (8) (i) who (8) (j) part (4) (k) hold on (4) (l) come from (4) (m) memories (2) (n) have to (4)	(a) we have (5) (b) step into the future (4) (c, d) high school (15) (e) it's (7) (f) musical (14) (g) e (h.1) let it go (2) (h.2) let's celebrate (4) (i) who says (4) (j) the best part (4) (k) hold on (4) (l) where we come from (4) (m) memories well have / memories that last forever (2) (n) have to (4)	A1/ A2	Education/school: - holidays - activities - weekend - school - birthday - summer - future plans	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
You Give Me Something	(a) me (17) (b) I (16) (c) give (12) (d) you (10) (e) something (8) (f) that (8) (g) to (7) (h) a (6) (i) heart (6) (j) my (6) (k) this (4) (l) someday (2) (m) alright (4)	(a) you/please give me something (8) (b.1) I might know my heart (3) (b.2) I'm willing to (4) (c) give it a try (4) (d, e) a (f) that makes me scared (4) (g) b (h) c (I, j) my heart (6) (k) this could be nothing (4) (l) someday (2) (m) alright (4)	A1/ A2	Job orientation & personal life: - activities - school - birthday - summer - future plans - arrangement	1 2 3 4 5
I won't Let You Go	(a) you (27) (b) will not (won't) (24) (c) let (22) (d) go (19)	(a.1) let you go (18) (b) I won't/ you won't (12) (c) a (d) a (e) and if there's love/life (8) (f) b (g) feel it (3)	A1/ A2	Personal life: - holidays - weekend - school - birthday - summer - future plans	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(e) and (14) (f) I (14) (g) it (11) (h) alone (10) (i) is ('s) (10) (j) take a little time (2) (k) open up (2)	(g.2) take my hand and hold it (2) (h) this is no time to be alone (5) (i) if your sky is falling (2) (j) take a little time (2) (k) open up (2)		- descriptions people	
Broken Strings	(a) I (18) (b) you (18) (c) it (16) (d) can (14) (e) the (13) (f) to (13)	(a.1) I tried (4) (a.2) I tried to hold on (2) (a.3) I can (5) (b) I love you (5) (c.1) It hurts too much (2) (c.2) It's too late (4) (c.3) It's the last chance to (2) (d) you can (6) (e.2) I can tell you something (2) (e.3) you can play on broken strings (2) (f.1) the truth hurts (2)	A1/ A2 (string = B1)	Personal life: - weekend - summer - future plans - arrangement	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(g) is (´s) (12)	(f.2) let me hold you (2) (f.3) for the last time (2) (g) a			
I'm Yours	(a) I (25) (b) you (13) (c) to (12) (d) do (11) (e) am ('m) (10) (f) look into	(a.1) I'm yours (8) (a.2) I cannot wait (3) (a.3) I won (3) (a.4) I tried to (1) (a.6) I cannot wait (1) (b.1) open up your mind/ your plans (4) (b.2) you believe (2) (c) to win some or learn some (1) (d) do you want to come one(4) (e) I'm trying to get back (1) (f) look into your heart (2)	A1/ A2	Personal life - activities - weekend - school - summer - hobbies - future plans - arrangement	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Domino	(a) baby (20) (b) me (20) (c) I (19) (d) the (19) (e) like (15) (f) in (11) (g) dancing (9) (h) moonlight (9) (i) come on (4) (j) don't you know (2) (k) rock my world (2) (l) dream (2)	(a) baby (20) (b.1) take me (6) (b.2) don't ever let me go (3) (b.3) got me feeling so right (4) (c) I can taste (2) (d) dancing in the moonlight (9) (e) like a cloud of smoke in the air (2) (f, g, h) d (i) come on (4) (j) don't you know (2) (k) rock my world until the sunlight (2) (l) make this dream the best I've ever known (2)	A1/ A2	Personal life: - holidays - weekend - summer - hobbies - future plans - weather forecast	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Price Tag	(a) the (38) (b) money (25) (c) about (22) (d) we (17) (e) price (11) (f) tag (9) (g) everybody (8) (h) forget (8) (i) look to (4) (j) feel (2)	(a) the price tag (9) (b) we don't need you money (4) (c.1) it's not about the money (4) (c.2) forget about the price (3) (d) b (e, f) a (g.1) why is everybody so serious?/ why is everybody so obsessed? (2) (g.2) everybody looks to the left/ to the right (4) (h) forget about (8) (i) look to (4) (j) can you feel that? (2)	A1/ A2	Job orientation & personal life: - activities - school - birthday - hobbies - illness - descriptions people	1 2 3 4 5
Baby	(a) baby (56) (b) I (30) (c) you (17)	(a) baby (b.1) I'm (9) (b.2) I thought (6) (b.3) I thought you'd always be mine (3) (b.4) I'll buy you anything/ any rings (2)	A1/ A2	Personal life: - birthday - school - shopping list - future plans	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(d) mine (12) (e) be (9) (f) gone (9) (g) am (´m) (9)	(c.1) you want my love/ you know my heart (2) (c.2) you know you love me, I know you care (1) (d) b (e) b (f, g) now I'm all gone (3)		- arrangement - descriptions people	
Hot N Cold	(a) you (80) (b) are (´re) (64) (c) then (28) (d) we (17) (e) up (15) (f) is ('s) (13) (g) it (12) (h) no (11) (i) cold (8)	(a, b, c.1) you're hot then you're cold (7) (a.2) you're in, then you're out (7) (a.3) you're yes, then you're no (7) (a.4) you're up, then you're down (7) (a.5) you don't really want to stay, you don't really want to go (3) (a.6) you change your mine like a girl changes clothes (2) (d, e.1) we fight, we break up (d.2) we kiss, we make up (f, g) it's black and it's white (7)	A1/ A2	Personal life: activities - birthday - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(j) hot (8) (k) shoul d (2)	(h, i, j) a (k) I should know (2)			
Teenage Dream	(a) I (21) (b) you (21) (c) tonigh t (18) (d) look (15) (e) me (15) (f) back (12) (g) ever (12) (h) and (10) (i) my (10) (j) chance (3)	(a) I'm (6) (b.1) you think I'm pretty/funny (2) (b.2) you and I will be young forever (1) (b.3) you make me feel like I'm living teenager dream (2) (c) be your teenage dream tonight (4) (d) and don't ever look back (12) (e) when you look at me (3) (f) d (g) d (h) d (i) my skin (4) (j) so take a chance (3)	A1/ A2	Personal life: activities - holidays - weekend - school - summer - future plans - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(k) way (5) (l) make (4) (m) let's (5) (n) until	(k) the way you turn me on (2) (l) you make (4) (m) let's (5) (n) we can dance until we die (2)			
California girls	(a) the (17) (b) California (10) (c) you (9) (d) coast (8) (e) and (6) (f) hands up (3) (g) sun-kissed skin (2) (h) fine, fresh (2) (i) wild (2)	(a) you could travel the world (2) (b) California (10) (c) you'll be falling in love (2) (d.1) Golden coast (2) (d.2) West Coast (5) (e) toned tan, fit and ready (2) (f) hands up (3) (g) sun-kissed skin (2) (h) fine, fresh (2) (i) wild (2)	A1/ A2	Job orientation & personal life: - activities - holidays - weekend - summer - future plans - descriptions people and things - trip to the country - weather forecast	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Tik Tok	(a) the (27) (b) up (17) (c) I (15) (d) my (14) (e) stop (12) (f) got (9) (g) we (9) (h) you (9) (i) fight til (j) pop	(a) the party (7) (b) blow my speakers up (5) (c) before I leave/ when I leave (2) (d) b (e) don't stop (5) (f) you got me (6) (g) we see (6) (h.1) you build me up (2) (h.2) you break me down (2) (i) fight til the sunlight (6) (j) make it pop	A1/ A2 (sunlight= B1)	Personal life: - holidays - weekend - school - birthday - summer - illness - weather forecast	1 2 3 4 5
Hung Up	(a) I (45) (b) am (´m) (39) (c) up (31) (d) you (29) (e) so (28) (f) slowly (27) (g) on (21) (h) waiting (21)	(a) I don't know what to do (2) (b) I'm fed up (9) (c) I'm hung up on you (9) (d) every little thing that you say or do (9) (e, f) so slowly (27) (g) I'm tired of waiting on you (9) (h) waiting for (12)/ waiting for a call (9) (i) hung up (19) (j) time goes by (27)	A1/ A2	Job orientation & personal life: - activities - holidays - weekend - school - summer - future plans - arrangement	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(i) hung (19) (j) goes by (27) (k) thing (10)	(k) little thing (10)		- descriptions people	
Let me love you	(a) you (67) (b) love (21) (c) me (21) (d) to (17) (e) baby (16) (f) the (16)	(a.1) let me love you (11) (a.2) you're (7) (a.3) you should (5) (a.4) show you (7) (a.5) give you everything you want and need (5) (b.1) the ways love's supposed to be (5) (c.1) let me be the one(14) (c.2) make me your selection (5) (d) b (e) baby (16) (f) c	A1/ A2	Personal life: - holidays - summer - future plans - arrangement - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
This Love	(a) I (14) (b) and (11) (c) goodbye (11) (d) me (11) (e) her (8) (f) love (7) (g) she (7) (h) before (6) (i) time (j) It's all right (2)	(a.1) I have no choice (5) (a.2) I won't say goodbye anymore (5) (b) and her heart is breakin' in front of me (5) (c) she said goodbye (5) (d) b (e) b (f) this love (6) (g) c (h) too many times before (5) (i) many times (6) (j) it's all right (2)	A1/ A2	Personal life: - holidays - activities - weekend - school - birthday - summer - future plans - description things	1 2 3 4 5
Sunday Morning	(a) I (14) (b) to (11) (c) and (10) (d) in (8) (e) you (8) (f) all (7)	(a.1) I never want to leave (2) (a.2) she is all I see (3) (b.1) back to (3) (b.2) it would lead me back to you (3) (c) come and rest your bones with me (3) (d) in darkness (3) (e) back to you (5)	A1/ A2	Job orientation & personal life: - activities - holidays - weekend - school - summer	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(g) me (6) (h) Sunday (5) (i) someday (5) (j) rain (2) (k) gets	(f) that may be all I need (g) c (h.1) (on) Sunday morning (5) (h.2) driving slow on Sunday morning (3) (i) someday (5) (j) rain is falling (2) (k.1) gets hard (3) (k.2) life gets (3)		- trip to the country - weather forecast	
Must Get Out	(a) I (36) (b) am (´m) (30) (c) you (15) (d) up (10) (e) this (8) (f) your (8) (g) get out (5) (h) guide (2) (i) listent to (cry) (2)	(a, b, c.1) I'm lifting you up (5) (a.2) I'm letting you down (5) (a.3) I'm not giving up (5) (a.4) I was (3) (a.5) forgot what I was looking for (2) (d) giving up (5) (e.1) this city (5) (e.2) this city made us crazy (5) (f) your love (5) (g) we must get out (5) (h) try to guide me in the right direction (2) (i) listen to you (cry) (2)	A1/ A2	Job orientation & personal life: - activities - holidays - weekend - birthday - summer - hobbies - descriptions people and things - trip to the country	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(j) till (5)	(j) dancing till (5)			
Won't Go Home Without You	(a) I (19) (b) it (18) (c) to (15) (d) you (12) (e) go (10) (f) make (10) (g) home (10) (h) me (10) (i) chance	(a) I won't go home without you (8) (b) make it (10) (c.1) chance to (6) (c.2) why does this happen to me? (2) (c.3) why does every moment have to be so hard? (2) (c.4) hard to believe (2) (d) without you (8) (e) a (f) b (a) a (h) give me (10) (i.1) one more chance (5) (i.2) give me one more chance (5)	A1/ A2	Personal life: - activities - hobbies - future plans - arrangement - illness	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Misery	(a) you (41) (b) me (30) (c) I (28) (d) am (´m) (14) (e) bad (12) (f) get/got (12) (g) really (12) (h) and (8)	(a.1) get you (12) (a.2) why do you do? (2) (a.3) what you do to me (2) (a.4) why won't you answer me? (2) (a.5) you really got me bad (9) (b.1) answer me (2) (b.2) the silence is slowly killing me (3) (b.3) so let me be (2) (c.1) I'm (14) (c.2) and I'll set you free (2) (c.3) I didn't care/ I don't care (2) (d) c (e) a (f) a (g) a (h) c	A1/ A2	Personal life: activities - school - future plans - arrangement - illness - descriptions people and things	1 2 3 4 5
Everything	(a) you (41) (b) are (´re) (21) (c) and (13) (d) it (11)	(a.1, b) you're (21) (a. 2) you make me sing (2) (c) and in this crazy life (3) (d, e) it's you (4)	A1/ A2	Personal life: - descriptions people and things	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(e) is ('s) (9) (f) every (8) (g) crazy (6) (h) me (5)	(f.1) every line (3) (f.2) you're every word (3) (f.3) you're everything (3) (g) through these crazy times (3) (h) make me sing (3)			
Haven't Met you yet	(a) I (43) (b) and (18) (c) you (17) (d) love (16) (e) it (14) (f) will ('ll) (13) (g) so (12) (h) work (11) (i) get (10) (j) out (10)	(a.1) I get (9) (a.2) I just haven't met you yet (6) (a.3) I know (5) (b) and now I can see every possibility (2) (c) I promise you (4) (d) love (e) so we can work to work it out/ I'll work to work it out (2) (f) you'll make me work (2) (g) I give/ I'll give so much more than I get (4) (h, i, j) e (k) we can (5)	A1/ A2	Job orientation: activities - holidays - weekend - summer - hobbies - future plans - arrangement	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(k) we can (5)				
You'll Always Find Your Way Back Home	(a) you (54) (b) can (37) (c) your (35) (d) change (18) (e) and (17) (f) way (13) (g) always (11) (h) back (11) (i) find (10)	(a.1) you can change your hair (4) (a.2) you can say goodbye (4) (a.3) you can say hello (4) (a.4) you can learn to fly (4) (a.5) you can chase your dream (4) (a.6) you can laugh and cry (4) (b) and you can change your clothes (4) (c) you can change your style (4) (d) you can change your jeans (4) (e) b	A1/ A2	Personal life: - activities - weekend - school - summer - future plans - descriptions people - a trip to the country - weather forecast	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(j) everybody (4)	(f, g, h, i) but you'll always find your way back home (8) (j) but everybody knows (4)			
Let's Get Crazy	(a) our (16) (b) crazy (14) (c) get (14) (d) a/ an (11) (e) let (11) (f) it (10) (g) up (8) (h) your (6) (i) time to (4)	(a.1) our songs, our style, our hair, our smile (2) (a.2) our laughs, our heart, our grace, our smart (2) (b) let's get crazy (11) (c) get up (3) (d) here's an invitation to every nation (2) dance (3) (e) b (f) it's worth taking a chance (4) (g) c (h) do your thing (4) (i) time to shout (4) (j) don't miss out (3) (k) always keeping it real (3)	A1/ A2 (worth= B1)	Job orientation & personal life: - activities - holidays - weekend - school - summer - future plans - arrangement - descriptions people and things - trip to the country	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(j) miss out (3) (k) always (3)				
Rockstar	(a) I (19) (b) you (15) (c) a (13) (d) star (11) (e) be (10) (f) rock (10) (g) on (7) (h) unusual (3) (i) typical (3)	(a.1) I (really) am a rock star (5) (a.2) I could fix the flat on your car (3) (b) guess you don't notice/ need this (3) (c) sometime I wish when the phone rings/ sometime I walk a little faster (2) (d, e, f) I might even be a rock star (2) (g) a (h, i) I'm unusual, not so typical (3)	A1/ A2	Personal life: - descriptions people and things	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
So Sick	(a) I (16) (b) so (14) (c) of (8) (d) can (6) (e) sick (5) (f) reason (2) (g) there's no more (2)	(a.1, b, c) I'm so sick of love songs (5) (a.2) (I'm) so done with wishing (2) (a.3) (I'm) so sad and slow (2) (a.4) (I'm) so tired of tear (2) (d) why can't I turn off the radio? (4) (e) a (f) and for some reason I just can't get over us/ that's the reason I'm so sick of love songs (2) (g) there's no more you/ anniversary (2)	A1/ A2	Personal life: - birthday - future plans - arrangement - illness - descriptions people	1 2 3 4 5
Miss Independent	(a) she (23) (b) her (21) (c) I (16) (d) that (16) (e) got (13) (f) a (12)	(a, b) she got her own thing (5) (c) I can't figure it out (2) (d) that's why I love her (5) (e) a, b (f) she walks like a boss/ she talks like a boss/ she moves like a boss/ she works like a boss/ plays like a	A1/ A2	Job orientation+ personal life: - activities - future plans - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(g) it (12) (h) about (11) (i) independent (11) (j) miss (10) (k) love (9) (l) spend (5)	boss/ she made for a boss (7) (g, h) it's somethin' about the way she moves/ her (7) (i, j) miss independent (10) (k) d (l) won't you come and spend a little time? (5)			
Closer	(a) I (55) (b) can (48) (c) just (42) (d) stop (33) (e) closer (17) (f) come (13) (g) her (8) (h) away (7) (i) myself (7) (j) own (2)	(a) I can feel her/ I can taste her (2) (b) I just can't pull myself away (4) (c) I just can't bring myself away (3) (d) I just can't stop (34) (e, f) come closer (13) (g) under her spell I can't break (4) (h) b, c (i) b, c (j) she wants to own me (2)	A1/ A2	Personal life: - activities - hobbies - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
One in A Million	(a) you (28) (b) I (27) (c) a (15) (d) one (15) (e) baby (14) (f) there (13) (g) better (11) (h) but (11) (i) nothing (11) (j) matter (2) (k) certai n (2) (l) It's (2)	(a.1) baby, you're the best I ever had (5) (a.2) whatever you do (2) (b.1) I'm certain that there ain't nothing better than this (5) (b.2) I can be in love (2) (b.3) I don't see no one but you (2) (c, d) girl you're so one in a million (5) (e) a (f) there's a million girls around (2) (g) b (h) but I just don't know (2) (i) b (j) other girls don't matter (2) (k) one thing is for certain (2) (l) it's working (2)	A1/ A2	Job orientation & personal life: - activities - hobbies - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
What Makes You Beautiful	(a) you (58) (b) know (17) (c) I (16) (d) beautiful (11) (e) can (8) (f) else (8) (g) that (8) (h) light up (4)	(a.1) you don't know (6) (a.2) you'll understand why I want you (3) (a.3) right now I'm looking at you and I can't believe (3) (a.4) everyone else but you (2) (a.5) when you smile (3) (b) you don't know you're beautiful (8) (c) if only saw what I can see (3) (d) b (e, f) everybody else in the room can see it (2) (g) that's what makes you beautiful (3) (h) baby you light up my world like nobody else (4)	A1/ A2	Personal life: - descriptions people and things	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Good Life	(a) good (27) (b) life (21) (c) this (18) (d) I (16) (e) a (13) (f) be (13) (g) to (13) (h) the (11) (i) sometimes (2)	(a, b, c) this could really be a good life (6) (d) I got this feeling that you can't fight (3) (e, f) a (g.1) day turns to night, night turns to whatever we want (2) (g.2) to my friends in New York, I say hello (2) (g.3) we all got our stories but please, tell me what there's to complain about (2) (h) the city is on fire tonight (3) (i) sometimes there's airplanes/ bullshit (2)	A1/ A2	Job orientation & personal life: - holidays - weekend - summer - future plans - descriptions people and things - trip to the country	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Feel	(a) I (32) (b) my (9) (c) feel (8) (d) in (7) (e) love (7) (f) understand (7) (g) not (6) (h) real (6) (i) sure (6) (j) running through (3) (k) come on (2) (l) role (2)	(a.1) I just wanna feel real love (4) (a.2) I need to feel real love and a life ever after (2) (b) hold my hand (2) (c) a (d) I just wanna feel the home that I live in (3) (e) a (f, g) not sure I understand (6) (h) a (i) f, g (j) I got too much life running through my veins (3) (k) come on (2) (l) (not sure I understand) the role I've been given (2)	A1/ A2	Job orientation & personal life: - activities - birthday - future plans - arrangement - descriptions people and things	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Shut Up	(a) shut (up) (88) (b) just (41) (c) I (34) (d) is (31) (e) that (30) (f) it (27) (g) stop (27) (h) the (27) (i) you (26) (j) baby (22) (k) all (21) (l) control (3) (m) different (3)	(a, b) shut up/ just shut up (76) (c.1) I'm crazy for tryin' to be your lady (3) (c.2) I'm goin 'crazy (3) (c.3) I miss you a lot/ I miss you even more (2) (c.4) I start walking (9) (d, e) is that all there is? (14) (f.1) we try to take it slow (3) (f.2) we try to make it work (3) (g.1) stop all that talking (7) (g.2, h) stop the talking, baby (just stop) (9) (i) I love you a lot/ I love you too (2) (j) just look what happened, baby (2) (k) d, e	A1/ A2	Personal life: - holidays - weekend - birthday - future plans - arrangement - illness - descriptions people and things	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
		(l) we're still losin' control (3) (m) that was a different thing (3)			
Where is the Love?	(a) the (62) (b) love (41) (c) is (25) (d) where (20) (e) is (´s) (16) (f) world (16) (g) got (13)	(a, b, c, d) where is the love? (17) (b.2) the love (32) (e) that's all we got one world, one world (2) (e.2) something's wrong with it (3) (f.1) one world (10) (f.2) we only got one world, one world (2) (g.1) got me (6) (g.2) 'cause people got, got me questionin´(3) (h) e (i.1) people (3)	A1/ A2	Partizipation in social life: - activities - future plans - arrangement - illness - descriptions people and things	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(h) one (10) (i) people (10) (j) come on (2) (k) I don't know (2) (l) help us (m) the reason (n) hurt	(i.2) people killin', people dyin' (2) (j) come on (2) (k) I don't know (2) (l) father, help us (2) (m) that's the reason why sometimes I'm feelin' under/down (2) (n) children hurt, hear them cryin' (2)			
I Gotta Feeling	(a) it (65) (b) 's (let's) (56) (c) do (42) (d) a (37) (e) good (32) (f) that (27) (g) night (26) (h) tonigh t (26) (i) and (25) (j) fill up (2)	(a.1) let's do it (15) (b) let's live it up (10) (c) and do it (42) (d, e) tonight's gonna be a good night (18) (f) I got a feeling that (2) (g, h) d, e (i) c (j) fill up my cup (2) (k) take it off (2) (l) let's paint the town (4)	A1/ A2	Personal life: - activities - future plans - arrange-ment	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(k) take off (2) (l) paint (4) (m) roof (2) (n) shout down (2) (o) do it gain (2)	(m) let's burn the roof (2) (n) we'll shut it down (4) (o) and then we'll do it again (2)			
Pictures of You	(a) of (30) (b) pictures (23) (c) the (19) (d) you (16) (e) me (14) (f) we (12) (g) to (11) (h) been (10)	(a) remind us all of what we used to be/ what we could have been (6) (b) picture of you, picture of me (9) (c) hung upon your wall for the world to see (4) (d, e) b (f) a (g) confess to me every secret moment, every stolen promise you believed (1)/ confess to me all that lies between us, all that lies between you and me (1) (h, i, j) a	A1/ A2 (confess to= B2)	Personal life: - activities - holidays - weekend - school - summer - arrangement - descriptions people	1 2 3 4 5

Song title	Lexical items with lexical count	Lexis to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
	(i) could (10) (j) have (10) (k) this is (7)	(k) this is the clock/the story/ the first sound/ the war/ the soldier/ the mother/ a drug (7)			
Without You	(a) you (39) (b) I (27) (c) without (23) (d) can (10) (e) am (4) (f) lost (4) (g) never (4) (h) will (4) (i) be (3)	(a) without you (23) (b.1) I am lost (2) (b.2) I can (8) (b.3) I lost my heart/ my mind (2) (c) a (d) I can't win/ rest/ fight/ quite now/ look/ take one more sleepless night (6) (e) I am vain (2) (f) I am lost (2) (g) I will never be the same (2) (h) I will never win this game/make it by (2) (i) g	A1/ A2	Personal life: - illness - descriptions people and things	1 2 3 4 5

Appendix H

Scoring Rubric

	Competences	Total
Part 1 **Fill in the Blanks**	Writing/ Reading Comprehension/ Language Resources (integrated) Receptive Knowledge	30 points (30 %) 6 points each correct answer 3 points for misspelled but correctly allocated answer

	Competences	Communicative text design (coherence, creativity, flow)	Language correctness (grammar, syntax)	Lexical accuracy	Total
Part 2 Writing Exercises	Writing/ Reading Comprehension/ Language Resources (integrated) Productive Knowledge	6 points (6%)	4 points (4%)	60 points (60%)	70 points (70%)
					Total
					100 points (100%)

PART 1

Gaps	Solutions	Maximum points achievable	Points achieved
Gap 1		6	____

Gaps	Solutions	Maxi-mum points achieva-ble	Points achieved
	_____ _____		
Gap 2	_____ _____	6	____
Gap 3	_____ _____	6	____
Gap 4	_____ _____	6	____
Gap 5	_____ _____	6	____
Maximum points achievable		**Points achieved**	
30 points		_____ points	

PART 2

1. LEXICAL ACCURACY

A) FORM

	Criteria	Excellent (8-10)	Good (6-8)	Satisfactory (4-6)	Needs Improvement (2-4)	Inadequate (0-2)	Max. Points	Points
1	**Written spelling**	The written form and spelling are excellent. There are no spelling errors, and the content is presented with exceptional clarity and precision.	The written form and spelling are good. There are minimal spelling errors, and they do not detract from the overall quality of the content	The written form and spelling are generally satisfactory. While there may be occasional spelling errors, they do not significantly hinder the comprehension of the content	The written form and spelling need substantial improvements. There are noticeable spelling errors and mistakes that impact the clarity of the content	The written form and spelling are significantly deficient. Numerous spelling errors and mistakes make the content difficult to understand	10	

	Crite-ria	Excellen t (8-10)	Good (6-8)	Satisfac-tory (4-6)	Needs Im-provement (2-4)	Ina-dequate (0-2)	Max. Poin ts	Poi nts
2	**Word parts**	The use of word parts is excel-lent. They are applied skillfully to en-hance the con-tent, re-sulting in a highly effective and pol-ished presenta-tion	The use of word parts is good. They are applied effec-tively to enhance the con-tent, and their us-age con-tributes posi-tively to the over-all qual-ity	The use of word parts is generally satisfac-tory. Word parts are used, but there is room for improve-ment in terms of their fre-quency and effective-ness in en-hancing the content	The use of word parts needs sig-nificant improve-ments. Word parts are sporad-ically used, and their application does not effectively enhance the content	The use of word parts is severely lacking. There is little to no utilization of word parts to en-hance the content	10	
	Total						20	

B) MEANING

	Crite-ria	Excellen t (5)	Good (4)	Satisfac-tory (3)	Needs Improve-ment (2)	Ina-dequate (1)	Max. Poin ts	Poin ts
1	**Lexi-cal range (word choic e)**	The lexi-cal range is excel-lent. Words are care-fully se-lected to convey nuances and depth of meaning. The vo-cabulary choices greatly enrich the con-tent and demon-strate a high level of language profi-ciency	The choice of words is good. There is a wide range of vocabu-lary used ef-fectively to con-vey ideas. The lan-guage is clear, precise, and en-hances the over-all qual-ity of the con-tent	The lexical range is generally satisfac-tory. There is an ade-quate vari-ety of words used, and most are suitable for the con-text. How-ever, there may be oc-casional in-stances of imprecise or repeti-tive lan-guage	The lexi-cal range needs sig-nificant improve-ments. While there is an attempt to use varied vocabu-lary, it is often re-petitive or not well-suited to the con-text, lead-ing to some confusion	The choice of words is severely limited and often inap-propriate for the context. The lan-guage lacks di-versity and richness, making it difficult to convey ideas effec-tively	5	

	Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)	Inadequate (1)	Max. Points	Points
2	**Form and meaning**	The form and meaning are excellent. Language structures are employed with precision to convey nuanced and complex meanings. The content is exceptionally clear, well-organized, and highly effective in communication	The form and meaning are well-aligned. Language structures are used effectively to convey clear and accurate meanings. The content is easy to understand and flows logically	The relationship between form and meaning is generally satisfactory. Most language structures are used effectively to convey intended meanings, but there may be occasional inconsistencies or minor errors	The connection between form and meaning needs significant improvements. While there is some attempt to match language structures with intended meanings, there are notable inconsistencies and errors	The relationship between form and meaning is unclear or incorrect. There are fundamental issues in how language structures are used to convey intended meanings	5	

	Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)	Inadequate (1)	Max. Points	Points
3	**Concept and references**	The understanding of the concept is excellent, and a wide range of relevant references is skillfully integrated. The content demonstrates a deep understanding, critical analysis, and a high level of scholarship.	The understanding of the concept is good, and relevant references are effectively incorporated. The content is well-structured and provides a clear and coherent presentation of ideas	The understanding of the concept is generally satisfactory, and some references are included. The content conveys a basic understanding but may lack depth or thorough exploration	The understanding of the concept needs significant improvements, and references are scarce or inadequately integrated. The content lacks depth and may lack logical connections	The understanding of the concept is lacking, and there are no references to support or substantiate the content. The content is disjointed and lacks coherence	5	

	Crite-ria	Excellen t (5)	Good (4)	Satisfac-tory (3)	Needs Improve-ment (2)	Ina-dequate (1)	Max. Poin ts	Poin ts
4	**Assoc ia-tions & conne ctions**	Associa-tions and connec-tions are excel-lent. Ideas and concepts are intri-cately linked and in-terwo-ven, cre-ating a seamless and highly cohesive presenta-tion. The connec-tions greatly enhance the depth and clar-ity of the study	Associa-tions and con-nections are good. Ideas and con-cepts are well-linked, provid-ing a clear and logi-cal flow to the content. The connec-tions en-hance the over-all un-der-standing	Associa-tions and connec-tions are generally satisfac-tory. There are efforts to link ideas and concepts, but some connec-tions may be under-developed or tangen-tial	Associa-tions and connec-tions need signifi-cant im-prove-ments. While there may be some attempts to link ideas, they are often un-clear or superfi-cial	The con-tent lacks associa-tions and meaningful connec-tions. There is little or no effort to link ideas or concepts within the study	5	
	Total						20	

C) USE

	Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)	Inadequate (1)	Max. Points	Points
1	**Grammatical functions**	The use of grammatical functions is excellent. The text is free from grammatical errors, and the language is precise, enhancing both clarity and fluency	Grammatical functions are used well. Errors are rare, and the text is clear and coherent, contributing positively to the overall quality of the writing	The use of grammatical functions is generally satisfactory. While there may be occasional errors, they do not significantly impede understanding, and the text remains largely coherent	Grammatical functions need significant improvements. There are noticeable and recurring grammatical errors that impact the overall clarity and coherence of the text	The use of grammatical functions is severely deficient. Frequent and critical grammatical errors hinder comprehension and make the text challenging to follow	5	

	Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)	Inadequate (1)	Max. Points	Points
2	**Collocations**	The use of collocations is excellent. Word combinations are precise and natural, contributing to a highly fluent and expressive text that enhances the overall quality of the writing	Collocations are used well. Errors in word combinations are rare, and the text flows naturally, enhancing both the coherence and expressiveness of the writing	The use of collocations is generally satisfactory. While there may be occasional instances of mismatched words, the majority of collocations are appropriate and contribute to overall fluency	Collocations need significant improvements. There are noticeable instances of incorrect word combinations or mismatches, affecting the overall fluency and naturalness of the text	The use of collocations is severely lacking. There are frequent mismatches and errors in collocating words, leading to incoherent and awkward language	5	

	Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)	Inadequate (1)	Max. Points	Points
3	**Constraints of use**	The awareness of constraints of use is excellent. The text seamlessly aligns with the intended register and frequency, resulting in a highly appropriate and polished presentation	Constraints of use are well-understood and applied effectively. The text consistently uses language that matches the intended register and frequency, contributing to overall appropriateness	The awareness of constraints of use is generally satisfactory. While there may be occasional mismatches in register or frequency, the majority of the language is appropriate for the context	Constraints of use need significant improvements. There are noticeable instances where the language does not match the intended register or frequency, affecting the text's appropriateness for the context	The awareness of constraints of use, such as register and frequency, is severely lacking. The text often uses inappropriate language for the context, making it jarring and discordant	5	

	Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)	Inadequate (1)	Max. Points	Points
4	**Contextual appropriateness**	Contextual appropriateness is excellent. The text seamlessly integrates with the context, enhancing relevance, coherence, and the overall effectiveness of communication	The text demonstrates a good understanding of contextual appropriateness. It consistently aligns with the context, ensuring relevance, coherence, and effective communication	Contextual appropriateness is generally satisfactory. While there may be occasional mismatches with the context, the majority of the text is relevant and coherent within the given context	Contextual appropriateness needs significant improvements. There are noticeable instances where the language and content do not fit the context, impacting the overall coherence and relevance	The text lacks contextual appropriateness. The language and content often do not align with the context, causing confusion and disconnect	5	
	Total						20	

2. COMMUNICATIVE TEXT DESIGN

	Criteria	Good (2)	Fair (1)	Inadequate (0)	Max. Points	Points
1	**Overall effectiveness**	The overall effectiveness of the text is good. The content is clear, well-organized, and effectively communicates the intended message. The reader can easily follow and understand the text	The overall effectiveness of the text is fair. While there may be some clarity in parts, the text lacks consistency in conveying the intended message. The reader may encounter difficulties in understanding the text	The overall effectiveness of the text is severely lacking. The content is confusing, disorganized, and does not effectively convey the intended message. The reader struggles to understand the text	2	
2	**Creativity and originality**	Creativity and originality are evident in the text. The content showcases imaginative thinking, innovative ideas, and a unique perspective. These elements enhance the overall quality of the text and engage the reader	There are some attempts at creativity and originality in the text, but they are limited and not fully developed. The content may have some unique aspects, but they do not significantly enhance the text	Creativity and originality are severely lacking in the text. The content is unoriginal, repetitive, and lacks any creative elements or unique perspectives. The text is unengaging	2	

	Criteria	Good (2)	Fair (1)	Inadequate (0)	Max. Points	Points
3	**Cohesion and flow**	Cohesion and flow in the text are good. The content is well-structured, and there is a logical progression of ideas. Transitions between sentences and paragraphs are smooth and effectively guide the reader through the text	Cohesion and flow in the text are fair. While there may be some attempts at organization, the text lacks consistency in connecting ideas. Transitions between sentences and paragraphs are present but may be abrupt or unclear	Cohesion and flow in the text are severely lacking. The content is disjointed, and there is no logical progression of ideas. Transitions between sentences and paragraphs are absent or ineffective	2	
	Total				6	

3. LANGUAGE CORRECTNESS

	Crite-ria	Very Good (4)	Good (3)	Fair (2)	Needs improve-ments (1)	Ina-dequate (0)	Max. Points	Points
1	**Gram mar**	Grammar is very good. The text is free from grammat-ical er-rors, and the lan-guage is precise, enhancing both clar-ity and fluency. Gramma-tical cor-rectness is a strong asset to the wri-ting	Grammar is good. There are few, if any, grammat-ical er-rors, and the text is clear and coherent, contrib-uting pos-itively to the over-all quality of the writing	Grammar is generally fair. While there may be occa-sional grammati-cal errors, the major-ity of the text is grammati-cally cor-rect, and the errors do not sig-nificantly impede un-derstand-ing	Grammar needs sig-nificant improve-ments. There are noticeable and recur-ring grammat-ical errors that im-pact the overall clarity and co-herence of the text. Compre-hension may be challen-ging	The use of gram-mar is se-verely de-ficient. Numer-ous and funda-mental grammat-ical errors are pre-sent through-out the text, mak-ing it al-most un-intelligi-ble. The errors sig-nificantly hinder compre-hension	4	
	Total						4	
Maximum points achievable					**Points achieved**			
70 points					_____ points			

OVERVIEW OF THE POINT DISTRIBUTION

	Max. Points	Points achieved
Part 1 **Fill in the Blanks**		
Part 2 **Writing Exercises:** **Lexical accuracy** **Form**		
Part 2 **Writing Exercises:** **Lexical accuracy** **Meaning**		
Part 2 **Writing Exercises:** **Lexical accuracy** **Use**		
Part 2 **Writing Exercises:** **Communicative text de-sign**		
Part 2 **Writing Exercises:** **Language correctness**		

Maximum achievable points	100 points
Total points achieved	_____ points
Examination grade according to the grade table below	_____

Code of the student: _____

Date: _____

Signature of the teacher: _____

Points achieved	**Label**	**German Grade**	**English Grade**
85-100 points	Excellent	1	A
68-84 points	Really good	2	B
51-67 points	Good	3	C
34-50 points	Satisfactory	4	D
17-33 points	Needs improvements	5	F
0-16 points	Inadequate	6	F

Appendix I

Normalization and Categorization of Songs Using MATLAB

The following MATLAB script was used to normalize and categorize songs into seven groups based on four musical and linguistic features: **tempo, song length, speech rate, and mean speed**. This normalization ensures an equal weightage for each feature, allowing for a more balanced categorization of songs. The songs were then assigned to one of seven groups using a sorting algorithm that minimizes variance across groups.

```
% Read data from Excel file
AJ = xlsread('Daten Excell.xlsx', 'Tabelle1', 'A1:ALN2021');

% Extract musical features
tempo = AJ(1:end,1);
length_songs = AJ(1:end,2);
speech_rate = AJ(1:end,3);
mean_speed = AJ(1:end,4);

% Normalize features using min-max scaling
normalized_mean_speed = (mean_speed - min(mean_speed)) / (max(mean_speed) - min(mean_speed));
normalized_tempo = (tempo - min(tempo)) / (max(tempo) - min(tempo));
normalized_speech_rate = (speech_rate - min(speech_rate)) / (max(speech_rate) - min(speech_rate));
normalized_length_songs = (length_songs - min(length_songs)) / (max(length_songs) - min(length_songs));

% Assign equal weightage to all features
weight_normalized_mean_speed = 0.25 * normalized_mean_speed;
weight_normalized_tempo = 0.25 * normalized_tempo;
weight_normalized_speech_rate = 0.25 * normalized_speech_rate;
weight_normalized_length_songs = 0.25 * normalized_length_songs;

% Calculate final weightage
weightage = weight_normalized_speech_rate + weight_normalized_tempo + ...
        weight_normalized_mean_speed + weight_normalized_length_songs;
```

```
% Define number of boxes (7) and distribute songs
nBoxes = 7;
nDataPointsPerBox = 8;

% Sort data in descending order
[sortedData, originalIndices] = sort(weightage, 'descend');

% Initialize boxes
boxes = cell(1, nBoxes);
boxSums = zeros(1, nBoxes);
boxIndices = cell(1, nBoxes);

% Distribute songs into boxes
for i = 1:56
    [~, minIndex] = min(boxSums);
    boxes{minIndex} = [boxes{minIndex}, sortedData(i)];
    boxSums(minIndex) = boxSums(minIndex) + sortedData(i);
    boxIndices{minIndex} = [boxIndices{minIndex}, originalIndices(i)];
end

% Display results
for i = 1:nBoxes
    fprintf('Box %d: [', i);
    fprintf('%0.2f ', boxes{i});
    fprintf('], Sum: %0.2f, Original Indices: [', boxSums(i));
    fprintf('%d ', boxIndices{i});
    fprintf(']\n');
end
```

After performing the normalization, the songs were categorized into **seven boxes**, ensuring balanced distribution based on their feature weightage. The results of this classification are summarized in the following table.

Table G1: *Weightage of Features for Vocabulary Tests*

Song	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Here Without You	73.0	3:50	1.53	67.78	0.23
If I Ain't Got You	119.5	3:44	2.72	141.69	0.54
One Day in Your Life	119.4	3:28	1.67	97.50	0.38
Sweet Dreams	122.3	3:30	2.19	214.00	0.55
Beautiful Liar	91.4	3:27	2.01	170.25	0.40
Just the Way You are	109.2	3:40	0.92	81.69	0.28
Count on Me	88.9	3:18	3.70	154.44	0.51
Dangerous	116.2	2:58	1.53	105.25	0.32
Au Revoir	127.9	3:08	1.54	144.91	0.41
I 'm Alive	101.6	3:31	1.29	116.03	0.31
Forever	120.2	4:37	2.32	178.85	0.62
Ain't no Other Man	127.9	3:49	2.38	201.58	0.60
Viva la Vida	128.2	4:03	1.82	139.02	0.51
This is Me	121.8	3:08	1.86	194.08	0.47
Lights	120.9	4:02	1.75	154.42	0.50
Right Round	125.0	3:23	2.97	304.77	0.71
What 've Been Looking for	140.3	2:00	1.90	93.50	0.34

Song	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
What Time is It?	116.1	3:18	2.31	119.39	0.44
I want It All	143.4	4:37	2.44	121.94	0.65
We're All in This Together	116.1	3:51	2.03	107.27	0.45
High School Musical	116.4	3:51	2.01	112.20	0.45
You Give Me Something	80.4	3:32	1.27	67.92	0.20
I won't Let You Go	105.6	3:48	1.44	83.68	0.33
Broken Strings	111.9	4:13	1.35	79.68	0.38
I'm Yours	151.4	4:01	2.01	88.87	0.55
Domino	127.1	3:50	1.85	104.86	0.46
Price Tag	117.8	3:44	2.37	120.26	0.48
Baby	129.9	3:34	2.07	116.07	0.48
Hot N Cold	132.8	3:38	2.00	103.76	0.47
Teenage Dream	120.0	3:48	1.91	104.47	0.44
California girls	125.1	3:53	1.91	100.94	0.46
Tik Tok	120.2	3:21	2.30	250.81	0.58
Hung Up	125.7	3:23	2.65	145.12	0.53
Let me love you	94.2	4:09	2.23	119.51	0.43
This Love	94.5	3:25	1.80	158.08	0.37

Song	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Sunday Morning	87.0	4:01	1.95	73.69	0.33
Must Get Out	96.7	3:56	1.61	81.35	0.33
Won't Go Home Without You	109.7	3:51	1.38	83.37	0.34
Misery	102.7	3:30	1.91	110.00	0.37
Everything	123.1	3:25	1.89	79.02	0.39
Haven't Met you yet	122.6	4:04	1.91	92.21	0.46
You'll Always Find Your Way Back Home	153.8	3:45	2.10	117.86	0.57
Let's Get Crazy	125.5	2:33	2.30	112.94	0.39
Rockstar	108.1	2:59	2.65	104.91	0.40
So Sick	94.7	3:33	1.11	63.38	0.23
Miss Independent	114.9	3:52	2.13	108.36	0.45
Closer	126.3	3:56	1.72	90.50	0.44
One in A Million	99.8	4:03	2.30	115.06	0.44
What Makes You Beautiful	125.7	3:26	2.11	119.70	0.46
Good Life	127.7	4:13	2.76	101.73	0.57
Feel	133.1	4:27	1.25	53.48	0.43

Song	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Shut Up	112.8	4:56	3.24	181.62	0.71
Where is the Love?	93.7	4:00	2.85	162.75	0.52
I Gotta Feeling	128.2	4:50	2.28	123.72	0.61
Pictures of You	104.5	3:12	1.98	101.87	0.34
Without You	128.1	3:28	0.95	52.21	0.30

Table G2: *Musical and Linguistic Characteristics of Songs in Box 1*

Songs of box 1	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Right Round	125.0	3:23	2.97	304.77	0.71
Where is the Love?	93.7	4:00	2.85	162.75	0.52
This is Me	121.8	3:08	1.86	194.08	0.47
High School Musical	116.4	3:51	2.01	112.20	0.45
Feel	133.1	4:27	1.25	53.48	0.43
This Love	94.5	3:25	1.80	158.08	0.37
Won't Go Home Without You	109.7	3:51	1.38	83.37	0.34
Here Without You	73.0	3:50	1.53	67.78	0.23

Songs of box 1	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Total	867.2	28:35	15.65	1136.51	**3.52**

Table G3: *Musical and Linguistic Characteristics of Songs in Box 2*

Songs of box 2	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Shut Up	112.8	4:56	3.24	181.62	0.71
Hung Up	125.7	3:23	2.65	145.12	0.53
Hot N Cold	132.8	3:38	2.00	103.76	0.47
We're All in This To-gether	116.1	3:51	2.03	107.27	0.45
Au Revoir	127.9	3:08	1.54	144.91	0.41
Broken Strings	111.9	4:13	1.35	79.68	0.38
Pictures of You	104.5	3:12	1.98	101.87	0.34
Just the Way You are	109.2	3:40	0.92	81.69	0.28
Total	940.9	28:41	15.71	945.92	**3.57**

Table G4: *Musical and Linguistic Characteristics of Songs in Box 3*

Songs of box 3	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
I want It All	143.4	4:37	2.44	121.94	0.65
If I Ain't Got You	119.5	3:44	2.72	141.69	0.54
Baby	129.9	3:34	2.07	116.07	0.48
What Makes You Beautiful	125.7	3:26	2.11	119.70	0.46
Teenage Dream	120.0	3:48	1.91	104.47	0.44
Everything	123.1	3:25	1.89	79.02	0.39
What I've Been Look-ing for	140.3	2:00	1.90	93.50	0.34
So Sick	94.7	3:33	1.11	63.38	0.23
Total	996.6	26:47	16.15	839.77	**3.52**

Table G5: *Musical and Linguistic Characteristics of Songs in Box 4*

Songs of box 4	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Forever	120.2	4:37	2.32	178.85	0.62
I'm Yours	151.4	4:01	2.01	88.87	0.55
Lights	120.9	4:02	1.75	154.42	0.50

Songs of box 4	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
California girls	125.1	3:53	1.91	100.94	0.46
Let me love you	94.2	4:09	2.23	119.51	0.43
Rockstar	108.1	2:59	2.65	104.91	0.40
Must Get Out	96.7	3:56	1.61	81.35	0.33
I 'm Alive	101.6	3:31	1.29	116.03	0.31
Total	918.2	29:48	15.77	944.88	**3.60**

Table G6: *Musical and Linguistic Characteristics of Songs in Box 5*

Songs of box 5	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
I Gotta Feeling	128.2	4:50	2.28	123.72	0.61
Sweet Dreams	122.3	3:30	2.19	214.00	0.55
Count on Me	88.9	3:18	3.70	154.44	0.51
Miss Inde-pendent	114.9	3:52	2.13	108.36	0.45
Closer	126.3	3:56	1.72	90.50	0.44

Songs of box 5	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
One Day in Your Life	119.4	3:28	1.67	97.50	0.38
Misery	102.7	3:30	1.91	110.00	0.37
You Give Me Some-thing	80.4	3:32	1.27	67.92	0.20
Total	883.1	28:36	16.87	966.44	**3.51**

Table G7: *Musical and Linguistic Characteristics of Songs in Box 6*

Songs of box 6	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Ain't no Other Man	127.9	3:49	2.38	201.58	0.60
You'll Al-ways Find Your Way Back Home	153.8	3:45	2.10	117.86	0.57
Price Tag	117.8	3:44	2.37	120.26	0.48
Domino	127.1	3:50	1.85	104.86	0.46
One in A Million	99.8	4:03	2.30	115.06	0.44
Let's Get Crazy	125.5	2:33	2.30	112.94	0.39

Songs of box 6	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Sunday Morning	87.0	4:01	1.95	73.69	0.33
Dangerous	116.2	2:58	1.53	105.25	0.32
Total	955.1	27:23	16.78	951.5	**3.61**

Table G8: *Musical and Linguistic Characteristics of Songs in Box 7*

Songs of box 7	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Tik Tok	120.2	3:21	2.30	250.81	0.58
Good Life	127.7	4:13	2.76	101.73	0.57
Viva la Vida	128.2	4:03	1.82	139.02	0.51
Haven't Met you yet	122.6	4:04	1.91	92.21	0.46
What Time is It?	116.1	3:18	2.31	119.39	0.44
Beautiful Liar	91.4	3:27	2.01	170.25	0.40
I won't Let You Go	105.6	3:48	1.44	83.68	0.33
Without You	128.1	3:28	0.95	52.21	0.30
Total	939.9	29:02	15.5	306.14	**3.59**

Appendix J

Table I1: *Advantages and Disadvantages of Typical Vocabulary Exercises*

Type of exercises	**Advantages**	**Disadvantages**
Matching words with pictures	- both interactive and print formats Another aspect to consider: - this test is ideal for visual learners	- discrete-point test - only receptive knowledge - only recall - only single words - decontextualised words - breadth vocabulary knowledge - form and meaning (no use) - no translation (monolingual) Other aspects to take into account: - subjective grading with multiple valid associations - inadequate for abstract or complex concepts without clear visuals
Brainstorming/ word web	- both interactive and print formats Another aspect to take into account: - it provide clear and concise instructions for students to understand the exercise	- discrete-point test and indirect test - only productive knowledge - only recall - only single words - decontextualised words - breadth vocabulary knowledge - only form (no meaning, use) - no translation (monolingual)

Type of exercises	Advantages	Disadvantages
Listen and draw	- only print format Other aspects to take into account: - it is ideal for visual learners - it enhances both auditory and visual comprehension through active listening	- discrete-point test and indirect test - only receptive knowledge - only recognition - only single words - decontextualised words - breadth vocabulary knowledge - only meaning (no form, no use) - no translation (monolingual) Other aspects to take into account: - grading can be subjective due to varying drawing quality and interpretation - not suitable for all vocabulary, especially abstract concepts - it requires access to drawing materials, which may not be universally available
Pronunciation	- integrative test (listening and speaking) - single words and multi-word units - contextualised words and multi-word units Another aspect to take into account:	- only productive knowledge (pronunciation rules, e.g. accent, stress, intonation) - only recall - breadth vocabulary knowledge - only form (no meaning, use) - no translation (monolingual) - neither interactive nor print formats

Type of exercises	Advantages	Disadvantages
	- it helps assess a learner's ability to pronounce words with the correct accent and clarity, which is crucial for effective real-life communication	Other aspects to take into account: - grading can be subjective, as it relies on the judgment of the tester - provides an opportunity for instructors to offer constructive feedback to help students improve their pronunciation
Ordering	- integrative test and direct test - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - both interactive and print formats Another aspect to take into account: - ordering simulates real-world language use, where understanding and using vocabulary in context is essential for effective communication	- only productive knowledge - only recall - form, meaning and use - no translation (monolingual) Other aspects to take into account: - grading may involve some subjectivity, especially if there are multiple correct ways to order the words - constructing meaningful sentences can be complex, and students may find it challenging, especially when dealing with abstract or complex vocabulary

Type of exercises	Advantages	Disadvantages
True/ False (and the variation of "Yes/ True")	- both interactive and print formats Another aspect to take into account: - grading is often straightforward and objective since there are clear correct and incorrect answers	- discrete-point test and indirect test - only receptive knowledge - only recognition - only single words - decontextualised words - breadth vocabulary knowledge - only meaning (no form, no use) - no translation (monolingual) - Another aspect to take into account: - some students may guess the answers, especially if they are unsure, leading to inaccurate results
Phonemic recognition	- single words and multi-word units - contextualised words and multi-word units - both interactive and print formats	- discrete-point test and direct test - only receptive knowledge - only recognition - breadth vocabulary knowledge - only form (no meaning, use) - no translation (monolingual) Other aspects to take into account: - phonemic recognition exercise can be complex, especially for students who are not familiar with phonetic

Type of exercises	Advantages	Disadvantages
		symbols or who are learning a new phonemic system - different English accents and dialects may have variations in pronunciation, making it challenging to create a standardized phonemic recognition exercise
Spelling	Another aspect to take into account: - grading is typically objective, with each correctly spelled word receiving full credit.	- discrete-point test and direct test - only productive knowledge - only recall - only single words - decontextualised words - breadth vocabulary knowledge - only form (no meaning, use) - no translation (monolingual) - neither interactive nor print formats Another aspect to take into account: - spelling exercises can be frustrating for students who struggle with spelling, potentially affecting their confidence and motivation

Type of exercises	Advantages	Disadvantages
Gap-filling	- integrative test and direct test - both receptive and productive knowldge - both recognition and recall - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - form, meaning and use - both interactive and print formats	- no translation (monolingual) Other aspects to take into account: - some students may guess the missing words without a full understanding of their meanings, which can lead to inaccurate results - grading may involve some subjectivity, especially if there are multiple correct words that could fit in the gap
Describing/naming pictures	- integrative test and direct test - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - form, meaning and use - translation (bilingual) - both interactive and print formats	- only productive knowledge - only recall Another aspect to take into account: - grading may involve some subjectivity, especially if there are multiple correct ways to describe a picture

Type of exercises	Advantages	Disadvantages
Word pairs	- both interactive and print formats	- discrete-point test and direct test - only productive knowledge - only recall - only single words - decontextualised words - breadth vocabulary knowledge - form and meaning (no use) - no translation (monolingual) Another aspect to take into account: - grading may involve some subjectivity, especially if there are multiple correct associations, synonyms, or antonyms for a given word
Word families	- both interactive and print formats (and orally) Another aspect to take into account: -they support comprehension skills as students learn to identify word meanings based on their familiarity with root words and affixes	- discrete-point test and direct test - only productive knowledge - only recall - only single words - decontextualised words - breadth vocabulary knowledge - form and meaning (no use) - no translation (monolingual) Another aspect to take into account: - some word families can be complex, particularly for learn-

Type of exercises	Advantages	Disadvantages
		ers who are not familiar with the language's morphological rules
Crossword completion	- both receptive and productive knowldge - both interactive and print formats	- discrete-point test and direct test - only recognition - only single words - decontextualised words - breadth vocabulary knowledge - form and meaning (no use) - no translation (monolingual) Another aspect to take into account: - some crossword puzzles can be complex, especially for learners who are not familiar with the format or who struggle with spatial reasoning

Type of exercises	Advantages	Disadvantages
Add one out	9. both interactive and print formats (and orally)	- discrete-point test and direct test - only receptive knowledge - only recognition - only single words - decontextualised words - breadth vocabulary knowledge - meaning and use (no form) - no translation (monolingual) Another aspect to take into account: - grading may involve some subjectivity, especially if there are multiple valid reasons for excluding a word, or if students provide explanations for their choices
(Contextualized) Multiple-choice	- integrative test and direct test - single words and multi-word units - contextualised words and multi-word units - both interactive and print formats Another aspect to take into account: - grading is typically objective, with each correctly cho-	- only receptive knowledge - only recognition - breadth vocabulary knowledge - breadth vocabulary knowledge - meaning and use (no form) - no translation (monolingual) Another aspect to take into account: - some students may guess the correct answer, reducing the accuracy of the assessment,

Type of exercises	Advantages	Disadvantages
	sen option receiving full credit	particularly if there are no penalties for incorrect responses
Minimal pairs	- both interactive and print formats (and orally)	- discrete-point test and direct test - only productive knowledge - only recognition - only single words - decontextualised words - breadth vocabulary knowledge - only form (no meaning, use) - no translation (monolingual) - Other aspects to take into account: - minimal pairs exercises typically focus on a limited set of words that share specific sound differences, so they may not assess a broad range of vocabulary - some minimal pairs can be quite complex, especially for learners who are not familiar with the phonetic symbols or terminology used to describe sounds

Type of exercises	Advantages	Disadvantages
Spot the mistake	- integrative test and direct test - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - form, meaning and use - both interactive and print formats Another aspect to take into account: - it encourages students to develop keen error recognition skills by identifying mistakes related to vocabulary use, such as word choice, grammar, or spelling	- only receptive knowledge - only recognition - no translation (monolingual) Other aspects to take into account: - grading may involve some subjectivity, especially if there are multiple possible explanations for a mistake or if students provide explanations that require interpretation - identifying and explaining mistakes can be complex, especially for nuanced errors, and may vary in difficulty depending on the vocabulary level
Response evaluation	- integrative test and direct test - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - form, meaning and use - both interactive and print formats	- only productive knowledge - only recognition - no translation (monolingual) Another aspect to take into account: - grading may involve some subjectivity, especially when assessing the appropriateness of responses or considering alternative correct answers

Type of exercises	Advantages	Disadvantages
Give definitions	- integrative test and direct test - single words and multi-word units - contextualised words - depth vocabulary knowledge - both interactive and print formats (and orally)	- only productive knowledge - only recall - form and meaning (no use) - no translation (monolingual)
Listing (e.g. give synonyms/ antonyms)	- both receptive and productive knowldge - both interactive and print formats Another aspect to take into account: - it provides clear and concise instructions for students to understand the exercise	- discrete-point test and indirect test - only recall - only single words - decontextualised words - breadth vocabulary knowledge - only form (no meaning, use) - no translation (monolingual) Other aspects to take into account: - word choice and order may vary but still be correct (subjective grading) - students may share or copy word lists, compromising the assessment's integrity

Type of exercises	Advantages	Disadvantages
Scrambled words or sentences	- both receptive and productive knowldge - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - form, meaning (inderrctly) and use - both interactive and print formats (and orally)	- discrete-point test and direct test - only productive knowledge - only recall - no translation (monolingual) Another aspect to take into account: - some scrambled words or sentences can be challenging, especially for learners who are not familiar with the vocabulary or sentence structure
Summarizing	- integrative test and direct test - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - both interactive and print formats (and orally)	- only receptive knowledge - only recognition - meaning and use (no form) - no translation (monolingual) Other aspects to take into account: - grading summaries may involve some subjectivity, as there can be multiple valid ways to summarize a text and assess vocabulary usage - summarizing can be complex, particularly for learners at lower language proficiency levels or for more challenging texts

Type of exercises	Advantages	Disadvantages
Paraphrasing	- integrative test and direct test - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - both interactive and print formats (and orally)	- only productive knowledge - only recognition - meaning and use (no form) - no translation (monolingual) Other aspects to take into account: - grading summaries may involve some subjectivity, as there can be multiple valid ways to summarize a text and assess vocabulary usage - summarizing can be complex, particularly for learners at lower language proficiency levels or for more challenging texts
Dictation	- integrative test and direct test - both receptive and productive knowldge - single words and multi-word units - contextualised words - both interactive and print formats (and orally)	- only recognition - depth vocabulary knowledge - only form (no meaning, use) - no translation (monolingual) Other aspects to take into account: - it requires a lot of time - it has a subjective judgment in scoring - grading can be subjective, especially if there are variations in spelling or handwriting interpretation

Type of exercises	Advantages	Disadvantages
Close exercise (e.g. C-Test)	- integrative test and direct test - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - form, meaning (indirectly) and use (directly) - both interactive and print formats (and orally)	- only productive knowledge - only recall - no translation (monolingual) Another aspect to take into account: - close exercise can be challenging, especially for learners at lower language proficiency levels or when dealing with complex texts
Translation	- integrative test and direct test - both receptive and productive knowldge - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - form, meaning and use - translation (bilingual) - both interactive and print formats (and orally) Another aspect to take into account: - translation exercises assess a student's ability to bridge the gap between two languages, providing a compre-	- only recall Another aspect to take into account: - grading may involve subjectivity, especially when assessing the accuracy and appropriateness of translations

Type of exercises	Advantages	Disadvantages
	hensive evaluation of their bilingual proficiency	
Writing exercise (e.g. essay, write a story ending)	- integrative test and direct test - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - form, meaning and use - both interactive and print formats (and orally)	- only productive knowledge - only recall - no translation (monolingual) Other aspects to take into account: - creating and grading essays can be time-consuming, especially for instructors with large classes - essays can be challenging for learners at lower language proficiency levels, and the assessment may not align with their current abilities
Oral interviews (e.g, job interview, discussion, spoken conversations, role play)	- integrative test and direct test - both recognition and recall - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge	only productive knowledge - no translation (monolingual) - neither interactive nor print formats Other aspects to take into account: - grading oral interviews can be subjective, as it depends

Type of exercises	Advantages	Disadvantages
	- form, meaning and use	on the assessor's judgment of vocabulary usage, pronunciation, and overall speaking skills - the quality of interviews may vary depending on the interviewer, the interviewee's comfort level, and the specific context of the interview
Paraphrase recognition	- integrative test and direct test - single words and multi-word units - contextualised words and multi-word units - depth vocabulary knowledge - form, meaning and use - both interactive and print formats Another aspect to take into account: - it simulates real-world language use, where recognizing synonyms and paraphrases is essential for effective communication	- only receptive knowledge - only recognition - no translation (monolingual) Another aspect to take into account: - grading may involve some subjectivity, especially if there are multiple correct paraphrases or interpretations

Appendix K

Steps for the Presentation **VIV 6 __** **__.__.202__**

1. The teacher is going to give you the multi-word units to present.

2. Your presentation should have the 4 steps presented in the table below[1]. Make sure they are present, and put a tick (✔) in the last column[2] on the right. The presentation should not be longer than 7 minutes for all the new multi-word units.

3. You should split the work: each student prepares 1-2 multi-word units because multi-unit words are 5 either[3] per song or lyric and the groups generally have 4 students.

4. The presentation must be sent at least one day before (until 8:00 pm) for the teacher to check.

5. Feel free to present the multi-word units in the way you prefer, either by talking in class or making a short video.

Steps	**What I should do**	**What can I do? Frontal or interactive presentation?**	**Aspect to present**	✔
Step 1	Pronounce the multi-word unit. Check the correct pronunciation on *Oxford Learner's Dictionaries*.	Ask the class to repeat the multi-word unit after you (or choose some students and ask them to repeat the multi-word unit) with the right pronunciation.	Spoken form.	
Step 2	Write or show the multi-word unit in the written form.	Ask students to write the multi-word unit under "Written form" on *Today's Multi-Word Units Worksheet.*	Written form + word parts.	
Step 3	Write or show the translation of the multi-word unit.	Ask students to write the translation under "Translation" on *Today's Multi-Word Units Worksheet.*	Form and meaning (meaning).	
Step 4	Write or show 1 or 2 sentences with the multi-word unit.	Ask students to write the sentence(s) under "Sentence in which the multi-unit word occurs" on *Today's Multi-Word Units Worksheet.*	Grammatical functions+ collocations (use).	

Link for the Oxford Learner's Dictionaries: https://www.oxfordlearnersdictionaries.com/

[1] below= unten

[2] column= Spalte

[3] either= entweder

Today's Multi-Word Units Worksheet **VIV 6 __** **__.__.2023**

You can fill out this worksheet or write the next multi-word units in your English notebook.

	Form	Meaning	Use
Example 0	**Written form** A little bit is never enough	**Translation** Ein kleines bisschen ist nie genug	**Sentence in which the multi-word unit occurs** I like chocolate, but a little bit is never enough for me
1	**Written form**	**Translation**	**Sentence in which the multi-word unit occurs**
2	**Written form**	**Translation**	**Sentence in which the multi-word unit occurs**
3	**Written form**	**Translation**	**Sentence in which the multi-word unit occurs**
4	**Written form**	**Translation**	**Sentence in which the multi-word unit occurs**
5	**Written form**	**Translation**	**Sentence in which the multi-word unit occurs**

Keep in mind that you have only one minute per multi-word unit, starting from card 1 to card 5. So, practice at home by presenting each multi-word unit within one minute.

.....

Card 1

Good morning everybody, my name is [your name] and today I am going to present the multi-word unit:

[Pronounce the multi-word unit]

Please, repeat this multi-word unit after me: "[Multi-word unit]"

The whole class repeats: "[Multi-word unit]"

.....

Card 2

Have a look at how this multi-word unit is written and write it in the *Written form* section of your *Today's Multi-Word Units Worksheet*

[Write or show the multi-word unit]

.....

Card 3

The German meaning of this multi-word unit is:

[Write or show the German translation]

Please write the meaning of this multi-word unit in the *Translation* section of your *Today's Multi-Word Units Worksheet*

.....

Card 4

I present the multi-word unit in a sentence:

[Write or show the multi-word unit in a sentence]

Please write the sentence in the *Sentence in which the multi-word unit occurs* section of your *Today's Multi-Word Units Worksheet*

.....

Card 5

Thanks for your attention

[Go back to card 2 to present the second multi-word unit or give the word to the next student]

Keep in mind that you have only one minute per multi-word unit, starting from card 1 to card 5. So, practice at home by presenting each multi-word unit within one minute.

.....

Card 1
Good morning everybody, my name is Antonio and today I am going to present the multi-word unit:
[A little bit is never enough]
Please, repeat this multi-word unit after me: "[A little bit is never enough]"
The whole class repeats: "[A little bit is never enough]"

.....

Card 2
Have a look at how this multi-word unit is written and write it in the *Written form* section of your *Today's Multi-Word Units Worksheet*
"[A little bit is never enough]"

.....

Card 3
The German meaning of this multi-word unit is:
[Ein kleines bisschen ist nie genug]
Please write the meaning of this multi-word unit in the *Translation* section of your *Today's Multi-Word Units Worksheet*

.....

Card 4
I present the multi-word unit in a sentence:
[I like chocolate, but a little bit is never enough for me]
Please write the sentence in the *Sentence in which the multi-word unit occurs* section of your *Today's Multi-Word Units Worksheet*

.....

Card 5
Thanks for your attention
[Go back to card 2 to present the second multi-word unit or give the word to the next student]

Dein Code

Dein Code besteht aus 4 Teilen:

1. Die 1. und 2. Buchstabe deines Namens;
2. Der 1. und 2. Buchstabe deines Nachnamens;
3. Die letzten 2 Ziffern deines Geburtsjahres;
4. Die letzten 2 Ziffern der Postleitzahl deiner Schule.

Beispiel: **An**ton **Mu**ster, Geburtstag am 04.01.20**10**, Postleitzahl der Schule 479**18**

Sein Code lautet ANMU1018

Wie lautet dein Code?

_____

Vivone, Antonio ___/___/ 2024

Fragebogen Pre- Intervention für Schülerinnen und Schüler

Der Fragebogen ist anonym. Schreibe deshalb nicht deinen Namen auf den Fragebogen, sondern deinen Code hier auf:_____.

Bitte fülle den folgenden Fragebogen mit Angaben zu deiner Person aus. In diesem Fragebogen gibt es keine „richtigen" oder „falschen" Antworten. Wichtig ist nur, dass du ehrlich antwortest!

1) Ich bin _____ Jahre alt.

2) Kreuze dein Geschlecht an. ☐ männlich ☐ weiblich ☐ divers.

3) Meine Muttersprache(n) ist/ sind_____.

4) Wie viele Sprachen kannst du außer deiner Muttersprache gut genug sprechen, um dich mit deiner Familie, Freunden und Bekannten zu unterhalten?_____
Welche Sprache(n)?_____

Bitte schätze die folgenden Aussagen ein.	**nie**	**1-2 Mal pro Monat**	**3-4 Mal pro Woche**	**5-6 Mal pro Woche**	**täglich**
5) Ich treffe mich mit Leuten, mit denen ich viel oder fast nur Englisch spreche.	☐	☐	☐	☐	☐
6) Ich lese Material (zum Beispiel Bücher, Zeitschriften, Online Artikel, etc.) auf Englisch.	☐	☐	☐	☐	☐
7) Ich schaue Videos, Filme oder Serien auf Englisch.	☐	☐	☐	☐	☐
8) Ich schreibe/ spreche in Chats, im Internet (zum Beispiel E-Mail, Blog, TikTok, Instagram, etc.) oder Computerspielen auf Englisch.	☐	☐	☐	☐	☐

9) Ich war seit Beginn der Sommerferien 2023 im englischsprachigen Ausland (z.B. USA, Vereinigtes Königreich, Kanada, Australien, Neuseeland).

☐ Ja ☐ Nein. Wenn deine Antwort „Nein" ist, gehe direkt zur Frage 14.

10) Wenn ja: In welchem Land?_____
11) Wenn ja: Wie oft warst du in diesem Zeitraum im englischsprachigen Ausland? _____Mal
12) Wenn ja: Wie lange warst du ungefähr dort? ____ Woche(n)

Bitte schätze die folgenden Aussagen ein.	**selten**	**1-3 Mal pro Woche**	**4-6 Mal pro Woche**	**1x pro Tag**	**mehr mals täglich**
13) In diesem Land habe ich Englisch gesprochen.	☐	☐	☐	☐	☐

1

Bitte schätze die folgenden Aussagen ein.	nie	1-3 Mal pro Woche	4-6 Mal pro Woche	täglich	mehr-mals täglich
14) Ich höre Musik auf Englisch (zum Beispiel auf TikTok, Instagram, Radio, Youtube, etc.).	☐	☐	☐	☐	☐
15) Ich höre **Pop-Lieder** auf Englisch (zum Beispiel die Lieder von Lady Gaga, Ariana Grande, Taylor Swift, Ed Sheeran, Billie Eilish).	☐	☐	☐	☐	☐

Bitte schätze die folgenden Aussagen ein.	nicht	kaum	etwas	sehr
16) Ich verstehe viele Wörter von den englischen Liedern beim Hören.	☐	☐	☐	☐
17) Ich mag Pop Musik (zum Beispiel die Musik von Lady Gaga, Ariana Grande, Taylor Swift, Ed Sheeran, Billie Eilish). Wenn nicht, welches Musikgenre (zum Beispiel Rock, Schlager, Klassik, Rap, Techno) magst du?_____.	☐	☐	☐	☐
18) Ich glaube, dass Musikunterricht außerhalb der Schule (zum Beispiel Privatunterricht, Musikschule) positive Einflüsse auf andere Bereiche meines Lebens haben kann, wie zum Beispiel beim Lernen, der Konzentration oder der Entspannung.	☐	☐	☐	☐

Bitte schätze die folgenden Aussagen ein.	nie	selten	oft	regel-mäßig
19) Ich erhalte Musikunterricht (zum Beispiel Privatunterricht, Musikschule) außerhalb der Schulzeit. Wenn ja, seit wann? Seit _____Jahren.	☐	☐	☐	☐
20) Ich gehe mit meinen Eltern zu musikalischen Veranstaltungen (zum Beispiel klassischen Konzerten, Opern, Ballettaufführungen oder Rock/Pop- und Jazz-Konzerten).	☐	☐	☐	☐

Bitte schätze die folgenden Aussagen ein.	nie	1 Mal pro Woche	2-3 Mal pro Woche	1 Stunde pro Tag
21) Ich spiele ein Instrument (zum Beispiel Flöte, Klavier, Gesang etc.).	☐	☐	☐	☐

22) Wie alt warst du, als du das erste Mal Musikunterricht außerhalb der Schulzeit (zum Beispiel Privatunterricht erhalten, Musikschule besucht) bekommen hast?

☐ Ich war____ Jahre alt ☐ Ich habe keinen Musikunterricht erhalten.

23) Ich habe ein nicht beeinträchtigtes Gehör. ☐ Ja ☐ Nein.
Wenn nein, beschreibe bitte deine Besonderheit (zum Beispiel absolutes Gehör, Hörstörung, angeborene Fehlbildung des Gehörs bei der Geburt):_____.

Vielen Dank, dass du diesen Fragebogen ausgefüllt hast!

Vivone, Antonio ___/___/ 2024

Fragebogen Post-Intervention für Schülerinnen und Schüler (Kontrollgruppe)

Der Fragebogen ist anonym. Schreibe deshalb nicht deinen Namen auf den Fragebogen, sondern deinen Code hier auf: _____.

Bitte fülle den folgenden Fragebogen mit Angaben zu deiner Person aus. In diesem Fragebogen gibt es keine „richtigen" oder „falschen" Antworten. Wichtig ist nur, dass du ehrlich antwortest!

Bitte schätze die folgenden Aussagen ein.	**nie**	**selten**	**oft**	**immer**
1) Ich habe mich während der letzten 2 Wochen im Englischunterricht wohl und entspannt gefühlt.	☐	☐	☐	☐
2) Ich habe mich in den letzten 2 Wochen leichter auf den Englischunterricht konzentriert.				
3) Es hat mir Spaß gemacht, im Unterricht englische Liedtexte als Geschichtenerzählung vorzutragen.	☐	☐	☐	☐
4) Mir haben die Liedtexte gefallen, mit denen wir in den letzten zwei Wochen im Englischunterricht gearbeitet haben.	☐	☐	☐	☐
5) Ich hatte in den letzten 2 Wochen immer wieder ein oder mehrere Liedtexte in meinem Kopf. Ich hatte einen oder mehrere Ohrwürmer. Wenn ja, mit welchen Liedtexten?_____ _____ _____	☐	☐	☐	☐

Bitte schätze die folgenden Aussagen ein.	**viel weniger**	**etwas weniger**	**gleich**	**etwas mehr**	**viel mehr**
6) In den letzten 2 Wochen habe ich mehr englische Wörter und Ausdrücke gelernt, als im Englischunterricht davor.	☐	☐	☐	☐	☐

Bitte schätze die folgenden Aussagen ein.	**nein**	**unwahrscheinlich**	**wahrscheinlich**	**definitiv**
7) Der Englischunterricht mit Liedtexten ist mir leichter gefallen, als der Englischunterricht davor.	☐	☐	☐	☐
8) Die Liedtexte und das Vorlesen haben mir geholfen, neue englische Wörter und Ausdrücke zu lernen.	☐	☐	☐	☐
9) Ich möchte gerne in Zukunft neue englische Wörter und Ausdrücke mit Liedtexten lernen.	☐	☐	☐	☐
10) Ich möchte gerne in Zukunft neue englische Wörter und Ausdrücke mit dem Vorlesen von Liedtexten lernen.	☐	☐	☐	☐
11) Ich möchte gerne im Fach Englisch mehr Unterricht mit Liedtexten haben.	☐	☐	☐	☐
12) Ich denke, dass das Lernen neuer englischer Wörter und Ausdrücke durch das Singen von Liedtexten besser funktioniert.	☐	☐	☐	☐

Vielen Dank, dass du diesen Fragebogen ausgefüllt hast! 1

Vivone, Antonio ___/___/ 2024

Fragebogen Post-Intervention für Schülerinnen und Schüler (Testgruppe)

Der Fragebogen ist anonym. Schreibe deshalb nicht deinen Namen auf den Fragebogen, sondern deinen Code hier auf: _____.

Bitte fülle den folgenden Fragebogen mit Angaben zu deiner Person aus. In diesem Fragebogen gibt es keine „richtigen" oder „falschen" Antworten. Wichtig ist nur, dass du ehrlich antwortest!

Bitte schätze die folgenden Aussagen ein.	**nie**	**selten**	**oft**	**immer**
1) Ich habe mich während der letzten 2 Wochen im Englischunterricht wohl und entspannt gefühlt.	☐	☐	☐	☐
2) Ich habe mich in den letzten 2 Wochen leichter auf den Englischunterricht konzentriert.	☐	☐	☐	☐
3) Es hat mir Spaß gemacht, im Unterricht englische Pop-Lieder zu singen.	☐	☐	☐	☐
4) Mir haben die Pop-Lieder gefallen, mit denen wir in den letzten zwei Wochen im Englischunterricht gearbeitet haben.	☐	☐	☐	☐
5) Ich hatte in den letzten 2 Wochen immer wieder ein oder mehrere Lieder in meinem Kopf. Ich hatte einen oder mehrere Ohrwürmer. Wenn ja, mit welchen Liedern?_____ _____ _____	☐	☐	☐	☐

Bitte schätze die folgenden Aussagen ein.	**viel weniger**	**etwas weniger**	**gleich**	**etwas mehr**	**viel mehr**
6) In den letzten 2 Wochen habe ich mehr englische Wörter und Ausdrücke gelernt, als im Englischunterricht davor.	☐	☐	☐	☐	☐

Bitte schätze die folgenden Aussagen ein.	**nein**	**unwahrscheinlich**	**wahrscheinlich**	**definitiv**
7) Der Englischunterricht mit Pop-Liedern ist mir leichter gefallen, als der Englischunterricht davor.	☐	☐	☐	☐
8) Die Pop-Lieder und das Singen haben mir geholfen, neue englische Wörter und Ausdrücke zu lernen.	☐	☐	☐	☐
9) Ich möchte gerne in Zukunft neue englische Wörter und Ausdrücke mit Pop-Liedern lernen.	☐	☐	☐	☐
10) Ich möchte gerne in Zukunft neue englische Wörter und Ausdrücke mit dem Singen von Pop-Liedern lernen.	☐	☐	☐	☐
11) Ich möchte gerne im Fach Englisch mehr Unterricht mit Pop-Liedern haben	☐	☐	☐	☐
12) Ich glaube, dass Musikunterricht außerhalb der Schule (zum Beispiel Privatunterricht, Musikschule) positive Einflüsse auf andere Bereiche meines Lebens haben kann, wie zum Beispiel beim Lernen, der Konzentration oder der Entspannung.	☐	☐	☐	☐

Vielen Dank, dass du diesen Fragebogen ausgefüllt hast! 1

Multi-word Units of the Box 3

Song/ Lyric 1 (I want it all)	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. I want it all 2. That's better 3. Think bigger 4. Only giving you the best review 5. A little bit is never enough	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 2 (If I ain't got you)	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. Some people want it all 2. But I don't want nothing at all 3. Some people want diamond rings 4. Some just want everything 5. But everything means nothing h	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 3 (Baby)	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. I'm like 2. Like (a baby) 3. Now I'm all gone/ IBM gone 4. I though you'd always be mine 5. I though	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 4 (What makes you beautiful)	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. If only you saw what I can see 2. You light up my world like nobody else 3. You don't know you're beautiful 4. Right now I'm looking at you and I can't believe 5. That's what makes you beautiful	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 5 (Teenage Dream)	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. You make me feel like I'm living a teenage dream 2. Let's run away 3. Don't ever look back 4. I believe this is real 5. So take a chance	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 6 (Everything)	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. In this crazy life 2. And through these crazy times 3. You make me sing 4. You're every line, you're every word 5. You're (my) everything	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 7 (What've been looking for)	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. This feelings like no other 2. I want you to know 3. Ive never had someone that knows me like you do4. I´ve never had someone as good for me as you 5. So lonely before I finally found what I ´ve looking for	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 8 (So sik)	Names of group members	Multi-Word Units to be presented	Date of Presentation
Song/ Lyric 8 (So sik) 1. I´m so sick of love songs, so sad and slow 2. So tired of tears 3. So done with wishing 4. You were still here 5. So why can't I turn off the radio?`	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Songs of box 3	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
I want It All	143.4	4:37	2.44	121.94	0.65
If I Ain´t Got You	119.5	3:44	2.72	141.69	0.54
Baby	129.9	3:34	2.07	116.07	0.48
What Makes You Beautiful	125.7	3:26	2.11	119.7	0.46
Teenage Dream	120.0	3:48	1.91	104.47	0.44
Everything	123.1	3:25	1.89	79.02	0.39
What I´ve Been Looking for	140.3	2:00	1.9	93.5	0.34
So Sick	94.7	3:33	1.11	63.38	0.23
Total	996.6	26:47	16.15	839.77	**3.52**

Song title	Lexical items with lexical frequency	Multi-word units to learn	CEFR	Topic & Subtopic	Unit
I Want It All	(a) it (57) (b) I (56) (c) want (54) (d) you (28) (e) all (18) (f) better (7) (g) think (2) (h) bigger (2)	(a) I want it all (10) (b) That's better (2) (c) Think bigger (2) (d) Only giving you the best review (3) (e) A little bit is never enough (2)	A1/ A2	Job orientation: - activities - holidays - weekend - school - birthday - future plans	1 2 3 4 5
If I Ain´t Got You	(a) I (36) (b) some (16) (c) want (15) (d) people (13)	(a) Some people want it all (3) (b) But I don't want nothing at all (3) (c) Some people want diamond rings (3) (d) Some just want everything (3) (e) But everything means nothing (3)	A1/ A2	Personal life: - activities - holiday - description of people and things	1 2 3 4 5
Baby	(a) baby (56) (b) I (30) (c) you (17) (d) mine (12) (e) be (9) (f) gone (9) (g) am (´m) (9)	(a) I was like/ I'm like (2) (b) Like (a) baby (12) (c) Now I'm all gone/ I'm gone (5) (d) I thought you'd always be mine (6) (e) I thought (6)	A1/ A2	Personal life: - birthday - school - shopping list - future plans - arrangement - descriptions of people	1 2 3 4 5
What Makes You Beautiful	(a) you (58) (b) know (17) (c) I (16) (d) beautiful (11) (e) can (8) (f) else (8) (g) that (8) (h) light up (4)	(a) You light up my world like nobody else (4) (b) You don't know you're beautiful (8) (c) If only you saw what I can see (3) (d) That's what makes you beautiful (3) (e) Right now I'm looking at you and I can't believe (3)	A1/ A2	Personal life: - descriptions of people and things	1 2 3 4 5

Song title	Lexical items with lexical frequency	Multi-word units to learn	CEFR	Topic & Subtopic	Unit
Teenage Dream	(a) I (21) (b) you (21) (c) look (15) (d) me (15) (e) back (12) (f) ever (12) (g) chance (3) (h) make (4) (i) let's (5)	(a) You make me feel like I'm living a teenage dream (3) (b) Let's run away (3) (c) don't ever look back (12) (d) I believe this is real (3) (e) So take a chance (3)	A1/ A2	Personal life: activities - holidays - weekend - school - summer - future plans - descriptions of people	1 2 3 4 5
Everything	(a) you (41) (b) are (´re) (21) (c) and (13) (d) every (8) (e) crazy (6) (f) me (5)	(a) And in this crazy life (3) (b) And through these crazy times (3) (c) You make me sing (3) (d) You're every line, you're every word (3) (e) You're (my) everything (3)	A1/ A2	Personal life: - descriptions of people and things	1 2 3 4 5
What I've Been Looking For	(a) do (21) (b) I (14) (c) you (13) (d) to (8) (e) like (6) (f) so (6) (g) for (5) (h) good (5) (i) no (5) (j) feeling (2)	(a) This feeling's like no other (b) I want you to know (2) (c) I´ve never had someone that knows me like you do (2) (d) I´ve never had someone as good for me as you (2) (e) So lonely before I finally found what I´ve been looking for (2)	A1/ A2	Personal life: - activities - holidays - weekend - school - birthday - summer - future plans - arrangement - descriptions of people	1 2 3 4 5
So Sick	(a) I (16) (b) so (14) (c) of (8) (d) can (6) (e) sick (5)	(a) I'm so sick of love songs, so sad and slow (5) (b) So tired of tears (5) (c) So done with wishing (5) (d) You were still here (3)/ she was still here (2) (e) So why can't I turn off the radio? (5)	A1/ A2	Personal life: - birthday - future plans - arrangement - illness - descriptions of people	1 2 3 4 5

Worksheet 1 (song/ lyric 1 of box 3) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

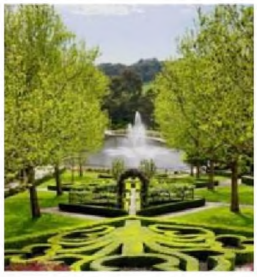
Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I want it all - that's better- think bigger (2 times) - only giving you the best review - a little bit is never enough

The Magical Adventure



Yesterday, I explored a magical place: an enchanted[1] garden.

"Hello, young adventurers! Welcome to our enchanted garden, where every plant and animal can speak!" said the man at the entrance of the garden.

As I entered the park, I saw two talking trees! They said, "In this garden, dreams come true. Don't be afraid to dream big". I smiled and thought, I should listen to the trees and **1.** _____.

Nearby, I found a river with a really old bridge[2] and I was unsure about using the bridge to continue my adventure. A dolphin hopped out[3] and whispered[4], "Sometimes, a little bit of courage can lead to great adventures". I asked him "Should I use the old bridge?". He replied "**2.** _____". I replied "Can I go on your back" He answered "**3.** _____. Go for it!"



On the other side of the river, I found a group of singing flowers. They sang really well, and I wished I could listen to them singing forever. I thought, **4.** _____ at home.

After 1 hour, the path[5] brought me back to the entrance[6] where the man asked me "How was it? Can you leave a review for me?" "It was fantastic. I am **5.** _____ ".

Thinking back to the day in the enchanted park, I realised "**6.** _____ for this magic place. I want to visit this park again soon".

---

[1] enchanted= verwunschen

[2] bridge= Brücke

[3] hope out= abspringen

[4] whisper= flüstern

[5] path= Pfad

[6] entrance= Eingangsbereich

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about your adventure.
2. *Start* with the given[7] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I want it all - that's better- think bigger - only giving you the best review - a little bit is never enough

The Secret Doorway[8]

On a sunny day, I found a special door in my backyard[9]. I opened it and discovered a magical world with talking animals and amazing places…

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[7] given= vorgegeben

[8] doorway= Pforte

[9] backyard= Hinterhof

Worksheet for Fast Finishers (song/ lyric 1 of box 3) **VIV 6__ __** **__.__.202_**

Exercise No. 3

Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. "I can not stop eating chocolate! I _____".
a) want it all
b) only giving you the best review
c) think bigger

2. Jenny got a fantastic gift and said, "Wow,_____ than what I thought!".
a) I want it all
b) that's better
c) think bigger



3. When Tim had a problem, Tim's motto was to _____ and face it with courage.
a) only giving you the best review
b) think bigger
c) that's better

4. Sarah wanted to create a masterpiece, so she decided to _____ for her art project.
a) that's better
b) think bigger
c) only giving you the best review

5. The little mouse found a big piece of cheese, and exclaimed, "I _____!".
a) want it all
b) only giving you the best review
c) think bigger

6. During the treasure hunt[10], the pirate captain told his crew to _____ and search for the hidden treasure and not to stop at the first piece of gold.
a) think bigger
b) I want it all
c) only giving you the best review



7. Emma exclaimed, "This ice cream is so delicious! _____ than any I've ever tasted!".
a) that's better
b) only giving you the best review
c) a little bit is never enough

[10] hunt= Jagd

Help card (song/ lyric 1 of box 3) **VIV 6 __** **__._.202_**



Look at the picture below[11] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting sentences in your text:

1. Suddenly, a little elf appeared and told me that he wanted to guide me in the magical land…

Plötzlich erschien eine kleine Elfe und sagte mir, dass sie mich in das magische Land führen wolle.…

2. In the middle of the forest, I sat on the grass…

Mitten im Wald, ich saß im Gras...

3. Suddenly, I heard a piece of music…

Plötzlich hörte ich ein Musikstück…

4. Exploring more, I found a magical place…

Bei weiteren Erkundungen fand ich einen magischen Ort...

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[11] below= unten

Worksheet 1 (song/ lyric 2 of box 3) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

some people want it all - but I don't want nothing at all - some people want diamond rings- some just want everything - but everything means nothing

Aspirations[1] and Dreams

Yesterday, I had a chat with my friend, Jake, about our aspirations. He said, "**1.**_____" trying to do well in everything in life. On the other hand, I told him, "**2.**_____". To me, happiness is found in simpler pleasures[2].

Since Jake, as many other teenagers dream of luxury and glamour, he told me, "**3.** _____" imagining a life with lots of fancy things. In response, I explained "**4.**_____". Material things are not the key to a fulfilling[3] life.

Later, walking through the city, we passed a jewellery store. Jake pointed at the dazzling[4] rings, and remarked, "**5.** _____".



I smiled, recognizing that he also desired the ring and told him again "Don't forget that material things are not the key to a fulfilling life!".



[1] aspiration= Bestrebung

[2] pleasure= Vergnügen

[3] fulfilling= erfüllt

[4] dazzling= schillernd

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about Mia's adventure.

1. *Start* with the given[5] sentence and *use* **all** the multi-word units from the grey box.
2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

some people want it all - but I don't want nothing at all - some people want diamond rings- some just want everything - but everything means nothing

Mia's Adventure

In a calm town called Harmonyville, there was a young girl named Mia. She was curious and full of energy, always thinking about the wonderful things in life. Mia thought that real happiness didn't come from material things. One day, Mia began a journey to find happiness...

Now it's your turn to continue the text using the multi-word units in the box and your imagination.

Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[5] given= vorgegeben

Worksheet for Fast Finishers (song/ lyric 2 of box 3) **VIV 6__ __** **__.__.202_**

Exercise No. 3

Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. Alex is different. He thinks " _____" but he believes in finding happiness without collecting[6] material things.

a) some people want it all
b) but I don't want nothing at all
c) but everything means nothing



2. Olivia dreams of a successful career while "_____" envisioning[7] a life of professional achievement[8].

a) some people want diamond rings
b) but I don't want nothing at all
c) some just want everything

3. Lucy is satisfied[9] with what she has. She says "_____" emphasising the value of her simple and happy life.

a) I don't want nothing at all
b) some people want it all
c) some people want diamond rings

4. Tina enjoys the simplicity of her life. She believes, "_____" but she's happy with what she has.

a) but I don't want nothing at all
b) some people want it all
c) some people want diamond rings

5. Peter finds joy in simple pleasures. He believes, "_____" and he loves the small things that make him happy.

a) some just want everything
b) I don't want nothing at all
c) some people want it all



6. Lisa enjoys travelling and experiencing different cultures. She says, "_____ but for me, the richness of life comes from exploring the world".

a) but I don't want nothing at all
b) some people want it all
c) some people want diamond rings

7. Daniel finds joy in learning new things. He says, "_____" but he thinks that learning and becoming a better person are the real important things.

a) but I don't want nothing at all
b) some just want everything
c) some people want diamond rings

---

[6] collect= sammeln

[7] envision= sich vorstellen

[8] achievement= Erfolg

[9] satisfied= zufrieden

Help card (song/ lyric 2 of box 3) **VIV 6 __** **__._.202_**



Look at the picture below[10] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting phrases in your text:

1. Mia found a dog in the woods. She decided to take care of it because…

Mia hat im Wald einen Hund gefunden. Sie beschloss, sich um ihn zu kümmern, weil...

2. …by joining art classes, where Mia discovered the happiness of expressing herself through.…

...durch die Teilnahme an Kunstkursen, in denen Mia das Glück entdeckte, sich durch... auszudrücken.

3. Piano playing filled Mia's days with delightful melodies and …

Das Klavierspiel füllte Mias Tage mit reizvollen Melodien und ...

4. Mia chose to grow pretty flowers…

Mia hat sich entschieden, schöne Blumen zu züchten…

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[10] below= unten

Worksheet 1 (song/ lyric 3 of box 3) **VIV 6 __** **__.__.202__**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I'm like - like (a) baby (2 times) - now I'm all gone/ I'm gone - I thought you'd always be mine - I thought

A Love Challenge[1]

Once upon a time, in the cozy[2] town of Harmonyville, Lily and Tom were a young and lovely couple.

One day, they argued because Tom had always been too jealous[3]. Lily told him "You are acting **1.**_____". He answered "I don't think so... I **2.**_____ a normal teenager caring about his girlfriend. **3.**_____ you didn't care about me anymore". "What are you talking about?" screamed[4] Lily, "I think we should take a break from our relationship and think about how we can solve these problems".



Tom felt lost and he could not say anything else but "**4.**_____. **5.**_____".

"I will always be yours, but I think it is better if we take a break and think rationally[5] about the problem in our relationship. You should control your jealousy[6] and don't act **6.** _____ anymore."

---

[1] challenge= Herausforderung

[2] cozy= gemütlich

[3] jealous= eifersüchtig

[4] scream= schreien

[5] rationally= rational

[6] jealousy = Eifersucht

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about Lily and Tom's adventure.
2. *Start* with the given[7] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I'm like - like (a) baby - now I'm all gone/ I'm gone - I thought you'd always be mine - I thought

The Enchanted[8] Forest Adventure

In the town of Harmonyville, Lily and Tom went to a magical forest. They felt like explorers[9]. In the forest, flowers danced, and friendly animals said hello…

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[7] given= vorgegeben

[8] enchanted= zauberhaft

[9] explorer= Entdecker

Worksheet for Fast Finishers (song/ lyric 3 of box 3) **VIV 6__ __** **__.__.202_**

Exercise No. 3

Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. Lily felt "_____" getting know a new world when she explored the enchanted forest.
a) like a baby
b) I'm like
c) I thought



2. Tom felt "_____" when he saw the wonderful rainbow in the sky.
a) you'd always be mine
b) all gone
c) like a baby

3. When Tom and Lily argued, Tom told her "_____" after she said "I think we should take a break from our relationship".
a) I though you'd always be mine
b) I'm like
c) I thought

4. The little bird sang "_____" in the morning sun.
a) I thought
b) like a baby
c) I'm like

5. Lily "_____" many times before to take a break from Tom but she didn't find the courage[10] to tell him before.
a) was like
b) though you'd always be mine
c) thought

6. I walked for one hour thought the labyrinth and I thought "_____".
a) I was like a baby
b) now I'm all gone
c) you'd always be mine



7. After a one week break from their relationship, Tom told Lily, I thought a lot about my jealousy and you were right. I hope now that "_____".
a) you will always be mine
b) I'm all gone
c) I'm like a child

[10] courage= Mut

Help card (song/ lyric 3 of box 3) **VIV 6 __** **__.__.202_**



Look at the picture below[11] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting phrases in your text:

1. Suddenly, they found a talking tree, and it said…

Plötzlich fanden sie einen sprechenden Baum, und der sagte...

2. As they walked deeper, they found a river. Lily felt like a child again, saying, …

Als sie weitergingen, fanden sie den Fluss. Lily fühlte sich wieder wie ein Kind und sagte,

3. A unicorn appeared, and Tom was fascinated, "I …

Ein Einhorn erschien, und Tom war fasziniert: "Ich

4. Tom found a mysterious key and said, …

Tom fand einen geheimnisvollen Schlüssel und sagte,

5. The path led them to a mysterious door. Tom hesitated, saying, …

Der Weg führte sie zu einer geheimnisvollen Tür. Tom zögerte und sagte, …

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[11] below= unten

Worksheet 1 (song/ lyric 4 of box 3) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

if only you saw what I can see - you light up my world like nobody else - you don't know you're beautiful - right now I'm looking at you and I can't believe - that's what makes you beautiful

Love at First Sight[1]

Once upon a time, in the small town of Harmonyville, there was a shy[2] girl named Lily. She dreamed of finding her real love. One day, a new boy named Tom arrived at her school. Tom was feeling a bit lost, but when he met Lily, something changed.



"You **1.** _____", Tom thought as Lily looked at Tom´s eyes for the first time. Love at first sight[3] was it. However, Lily was still unaware of Tom´s feelings. For that reason, Tom decided to write her a letter expressing his true feelings. He wrote, "**2.**_____, but for me, you are amazing. **3.** _____, you would realise how wonderful you are".

Tom hoped Lily would understand how special she was for him only from these few words. Lily received the letter and read it in front of Tom. She blushed[4], not expecting such sweet words. She looked at Tom and smiled. "You blushed, Lily, **4.** _____" said Tom looking into her eyes. Lily replied "**5.** _____ someone sees me in this way". From that day on, Lily and Tom became a couple, sharing smiles and making their town a brighter place.

[1] sight= blick

[2] shy= schüchtern

[3] love at the first sight= Liebe auf den ersten Blick

[4] blush= erröten

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about Lily and Tom's adventure.
2. *Start* with the given[5] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

if only you saw what I can see - you light up my world like nobody else - you don't know you're beautiful - right now I'm looking at you and I can't believe - that's what makes you beautiful

Lily and Tom's Adventure

Once in a happy town called Harmonyville, Lily and Tom, the couple, started a magical journey. The sun was very bright, and everyone was laughing. "Guess[6] what?" Tom said. "If you could see what I see, today is going to be amazing!"…

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[5] given= vorgegeben

[6] guess= raten

Worksheet for Fast Finishers (song/ lyric 4 of box 3) **VIV 6__ __** **__.__.202_**

Exercise No. 3

Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

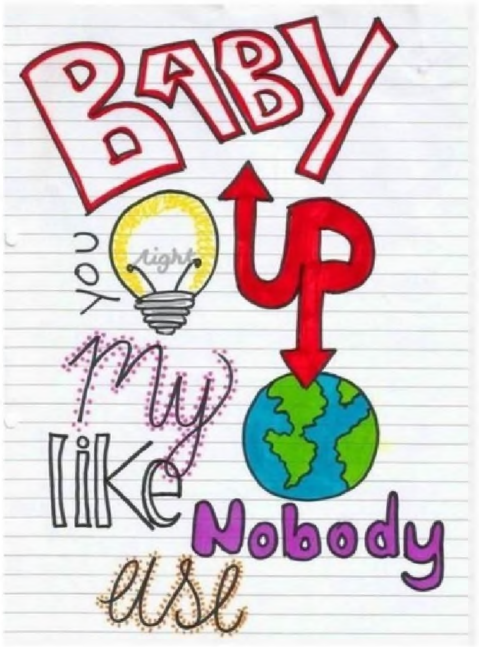
1. If only you saw what I can see, you would know that _____.
a) right now I'm looking at you and I can't believe
b) you light up my world like nobody else
c) that's what makes you beautiful



2. _____ when you help your friends.
a) you light up my world like nobody else
b) right now I'm looking at you and I can't believe
c) I can't believe

3. _____ with your kindness and laughter[7].
a) if only you saw what I can see
b) right now I'm looking at you and I can't believe
c) you light up my world like nobody else

4. Your unique qualities, your passionate character and your love for animals is _____.
a) light up my world like nobody else
b) what makes you beautiful
c) that's what makes you beautiful



5. By being a great friend _____.
a) you light up my world like nobody else
b) you don't know you're beautiful
c) that's what makes you beautiful

6. _____, you'd appreciate the beauty of nature.
a) you don't know you're beautiful
b) right now I'm looking at you and I can't believe
c) if only you saw what I can see

7. _____ when you walk into the room.
a) you light up my world like nobody else
b) right now I'm looking at you and I can't believe
c) that's what makes you beautiful

8. You don't know you're beautiful and _____.
a) you light up my world like nobody else
b) right now I'm looking at you and I can't believe
c) that's what makes you beautiful

[7] laughter= Lachen

Help card (song/ lyric 4 of box 3) **VIV 6 __** **__._.2023**



Look at the picture below[8] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting phrases in your text:

1. As they walked, Lily told Tom, "…

Während sie spazieren gingen, erzählte Lily Tom, "…

2. Lily smiled and replied, "Right now I'm looking at you,…

Lily lächelte und antwortete: "Ich sehe dich gerade an, …

3. Lily laughed and said, "You don't know …

Lily lachte und sagte: "Du weißt es nicht…

4. They found a secret garden, and Tom said, "…

Sie fanden einen geheimen Garten, und Tom sagte, "…

5. They found a field of wildflowers, and Tom said, "…

Sie fanden ein Feld mit Wildblumen, und Tom sagte, "…

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[8] below= unten

Worksheet 1 (song/ lyric 5 of box 3) **VIV 6 __** **__.__.2023**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

you make me feel like I'm living a teenage dream - let's run away - don't ever look back - I believe this is real - so take a chance

Magical Adventures: A Tale[1] of Friendship and Discovery



Once upon a time, there was a group of friends who decided to go on an adventurous journey. They believed in the magic of friendship and the idea that anything is possible. One day, they gathered[2] together and said, "**1.** _____, and explore the world together!". They packed their bags, filled with excitement[3] and curiosity[4]. As they walked through the enchanted forest, they encountered[5] a mysterious door. The door had a sign that said, "**2.**_____ and discover what lies ahead".

With courage[6] in their hearts they opened the door and found themselves in a magical land. They felt as if they were in a dream. One friend turned to the others and said, "**3.** _____, like we're in a fairy tale!".

The friends continued their journey, facing challenges[7] and enjoying every moment. Along the way, they discovered a secret passage. One of them exclaimed, "**4.**_____, and see where it leads us!".

As they reached the end of their adventure, they gathered in a big park. The night was filled with laughter and joy. Looking at each other, they realised that they shared a special moment and said, "**5.** _____".

[1] tale= Märchen

[2] gather= sammeln

[3] excitement= Aufregung

[4] curiosity= Neugierde

[5] encounter= begegnen

[6] courage= Mut

[7] challenge= Herausforderung



Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about the adventure of a group of friends.
2. *Start* with the given[51] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

you make me feel like I'm living a teenage dream - let's run away - don't ever look back - I believe this is real - so take a chance

The Magical Journey

In a peaceful[52] town, some friends had big ideas. They said, "Let's go on an adventure!" They packed their bags and shouted "…

Now it's your turn to continue the text using the multi-word units in the box and your imagination.

Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[51] given= vorgegeben

[52] peaceful= friedlich/ ruhig

Worksheet for Fast Finishers (song/ lyric 5 of box 3) **VIV 6__ __** **__.__.202_**

Exercise No. 3

Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.



1. The friends found a magical door and decided, "_____ and explore the enchanted world together!".

a) you make me feel like I'm living a teenage dream
b) let's run away
c) so take a chance

2. As they walked through the mysterious forest, a friend said, "_____ and see where this path leads!".

a) you make me feel like I'm living a teenage dream
b) I believe this is real
c) let's run inside

3. The friends hesitated at the edge[10] of the cliff[11], and one shouted, "_____ and jump into the unknown!".

a) I believe this is real
b) don't ever look back
c) so take a chance

4. They reached a beautiful lake, and someone suggested, "_____ and swim in the crystal-clear water!".

a) don't ever look back
b) I believe this is real
c) let's run away

5. The friends discovered a magical portal and wondered, "_____ and step through to another world?".

a) I believe this is real
b) let's run away
c) don't ever look back



6. At the rainbow bridge, a friend encouraged, "_____ and cross to the other side!".

a) don't ever look back
b) so take a chance
c) I believe this is real

7. As the adventure came to an end, a friend told the others, "_____ but cherish the memories we made! That is our new motto".

a) don't ever look back
b) you make me feel like I'm living a teenage dream
c) let's run away

---

[10] edge= Rand

[11] cliff= Klippe

Help card (song/ lyric 5 of box 3) **VIV 6 __** **__._.2023**



Look at the picture below[12] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting phrases in your text:

1. "Let's run away!". The friends walked through the magic land, feeling…

"Lass uns weglaufen!". Die Freunde liefen durch das magische Land und fühlten sich…

2. Suddenly, they discovered a mysterious cave.…

Plötzlich entdeckten sie eine geheimnisvolle Höhle…

3. Inside the cave, they found…

Im Inneren der Höhle fanden sie…

4. As they went on, they came to a bridge. One friend stopped, but another friend said, …

Als sie weitergingen, kamen sie an eine Brücke. Ein Freund hielt an, aber ein anderer Freund sagte,…

5. … they looked below, amazed at the magical world they discovered and …

…schauten sie nach unten und staunten über die magische Welt, die sie entdeckten, und …

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[12] below= unten

Worksheet 1 (song/ lyric 6 of box 3) **VIV 6 __** **__.__.2023**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

in this crazy life - and through these crazy times - you make me sing -
you're every line, you're every word - you're (my everything)

Friendship's Magical Journey: A Story of Smiles and Happiness

A long time ago, in a small village, some friends started a trip. **1.** _____ **2.** _____ they enjoyed every moment believing in the magic of togetherness[1]. During their adventure, they came across a cave[2]. At that moment, one friend started to sing the song *Everything* by Michael Bublé. After a few minutes, another friend also started to sing with him. They sang a beautiful duo[3] while the other friends enjoyed it. After having sung the song, the second friend told the other "**3.** _____! It was great, thank you".



As the day turned into night, they gathered[4] around a small fire. Someone started to sing and the others followed. The warmth[5] of the fire matched the warmth of their friendship, creating a comforting space filled with music, stories and laughter.

Underneath the sky, one friend grateful for the simplicity of friendship and the joy of being together said, "You know guys, **4.**_____ **5.**_____!". Every word, every moment, felt special in their hearts when they were together.

[1] togetherness= Miteinander

[2] cave= Höhle

[3] duo= Duett

[4] gather= sammeln

[5] warmth= Wärme

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about the adventure of a group of friends.
2. *Start* with the given[61] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

in this crazy life - and through these crazy times - you make me sing -
you're every line, you're every word - you're (my everything)

The Magical Journey

A long time ago, in a small town, four friends chose to start a big adventure. They believed in the magic of friendship and wanted to explore the world together. So, on a sunny day, they packed their bags and left, excited for what would happen next.....

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[61] given= vorgegeben

Worksheet for Fast Finishers (song/ lyric 6 of box 3) **VIV 6__ __** **__.__.202_**

Exercise No. 3

Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. Going up the mountain, the amazing view made us speechless[7]. We said, "_____ it is really difficult to find a quiet place like this one".

a) in this crazy life
b) you make me sing
c) you're every line, you're every word



2. _____ like a rockstar just because you are crazy like me.

a) in this crazy life
b) you're every line, you're every word
c) you make me sing

3. _____ I forgot my lunch, because I am very stressed!.

a) through these crazy times
b) in this crazy life
c) you're every line, you're every word



4. _____ I dance in the rain.

a) in this crazy life
b) you're every line, you're every word
c) you make me sing

5. The truth is that _____ in my secret diary.

a) you're every line, you're every word
b) you make me sing
c) through these crazy times

6. _____ in my dream last night.

a) you were every line, you were every word
b) you make me sing
c) you're my everything

7. _____ I found peace only in your heart.

a) and in this crazy life
b) you make me sing
c) you're my everything

[7] speechless= sprachlos

Help card (song/ lyric 6 of box 3) **VIV 6 __** **__._.2023**



Look at the picture below[8] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting phrases in your text:

1. … they found a magical forest with talking trees and.…

... fanden sie einen magischen Wald mit sprechenden Bäumen und...

2. "…" when they found a river that went to a secret waterfall.…

"…" als sie einen Fluss fanden, der zu einem geheimen Wasserfall führte...

3. … they shouted, going up a big mountain, feeling the wind on their faces and.…

... riefen sie, als sie einen großen Berg hinaufstiegen, den Wind auf ihren Gesichtern spürten und...

4. …they helped each other when things were hard, for example…

... sie haben sich gegenseitig geholfen, wenn es schwierig war, zum Beispiel…

5. … they laughed a lot in a large valley while camping under the stars. They were happy because they had a special journey together…

… sie lachten viel in einem großen Tal, während sie unter dem Sternenhimmel zelteten. Sie waren glücklich, weil sie eine besondere Reise zusammen hatten…

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[8] below= unten

Worksheet 1 (song/ lyric 7 of box 3) **VIV 6 __** **__.__.2023**

Exercise No. 1 (10 minutes)- Pair work
Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

this feeling's like no other - I want you to know - I've never had someone that knows me like you do - I've never had someone as good for me as you - so lonely before I finally found what I've been looking for

Finding Love and Understanding: Lily and Tom's Love Story



Once upon a time[1] there was a young girl named Lily. She often felt so lonely[2] because she was searching for something special in her life. One day, she met Tom who told her, "Lily, **1.** _____ that you're not alone. I would like to be your friend if you want". Lily smiled at him and nodded[3] her head.

Tom and Lily started dating each other, and after a few months, they became a couple. As Lily and Tom spent more time together, Lily felt a change in her heart. She thought about the past when she felt sad. "**2.**_____. Now, everything seemed to fall into place. **3.** _____" she thought in her head and decided to share her thoughts with Tom.

"Tom I would like to tell you something" said Lily. At that moment, Tom told Lily "Me too. I want you to know that **4.** _____. You have a way of understanding me that I've never found before".

"Oh Tom, I feel the same. **5.** _____. Your kindness and love mean the world to me" answered Lily smiling at Tom. Lily and Tom spent their entire lives together.

[1] once upon a time= es war einmal

[2] lonely= einsam

[3] nod= nicken

Exercise No. 2 (10 minutes)- Pair work
Instructions

1. *Write* a short text (at least 50 words) about Sarah's adventure.
2. *Start* with the given[4] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

this feeling's like no other - I want you to know - I've never had someone that knows me like you do - I've never had someone as good for me as you - so lonely before I finally found what I've been looking for

Sarah's Special Garden Adventure
A long time ago, in a magical place, Sarah, a curious[5] girl, went on an adventure. When she went into the special garden, a butterfly[6] said, "Welcome to our land, dear Sarah..."

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[4] given= vorgegeben

[5] curious= neugierig

[6] butterfly= Schmetterling

Worksheet for Fast Finishers (song/ lyric 7 of box 3) **VIV 6__ __** **__.__.202_**

Exercise No. 3

Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. When I tasted the strange fruit, I thought, "_____".
a) this flavor's like no other
b) I want you to know
c) I've never had someone as good for me as you



2. Looking at the stars, I said quietly, "_____".
a) I want you to know
b) this feeling's like no other
c) I've never had someone that knows me like you do

3. Finding my lost toy under the bed, I felt, "_____".
a) so lonely before I finally found what I've been looking for
b) I've never had someone as good for me as you
c) I want you to know

4. After four years on the football team, I thought, "_____".
a) I've never had someone that knows me like they do
b) this feeling's like no other
c) I want you to know

5. Building a treehouse[7] with my friend, I thought, "_____".
a) so lonely before I finally found what I've been looking for
b) I've never had someone as good for me as them
c) I want you to know

6. Looking into Tom´s eyes, I told him "_____".
a) I want you to know
b) this feeling's like no other
c) I've never had someone as good for me as you

7. Adopting a dog from the shelter[8], I thought, "_____".
a) I've never had someone as good for me as you
b) I want you to know
c) this connection is like no other



[7] treehouse= Baumhaus

[8] shelter= Tierheim

Help card (song/ lyric 7 of box 3) **VIV 6 __** **__._.2023**



Look at the picture below[9] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting phrases in your text:

1. She went to a special place and discovered hidden secrets…

Sie ging an einen besonderen Ort und entdeckte verborgene Geheimnisse…

2. Walking through the garden, Sarah found a butterfly. They became good friends and found…

Bei einem Spaziergang durch den Garten fand Sarah einen Schmetterling. Sie wurden gute Freunde und fanden…

3. In this magical place, she discovered…

An diesem magischen Ort entdeckten sie…

4. Sarah was happy and thankful for the special …

Sarah war glücklich und dankbar für die besondere…

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[9] below= unten

Worksheet 1 (song/ lyric 8 of box 3) **VIV 6 __** **__.__.2023**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I'm so sick of love songs, so sad and slow - so tired of tears - so done with wishing (2 times) - you were still here - so why can't I turn off the radio?

A Song of Memories

Once upon a time in a quiet[1] town, lived a girl named Lily. She had a favorite radio station that played love songs all day, and she was used to listening to this one in her free time. One day, Lily felt a bit down, thinking about the past when her boyfriends had to end their love story. "**1.** _____" she sighed[2], thinking about the past.

Lily remembered her boyfriend Tom telling her "**2.** _____ We can go outside and enjoy the good weather". She felt a bit lost without her boyfriend. Tom had moved away[3] and Lily felt **3.**_____.



She decided to go through their old photos, reminiscing[4] about the good times. "**4.**_____ **5.**_____" Lily whispered[5] to the pictures. She missed Tom's laughter and love.

Lily understood that sometimes life changes, and people have to move on. "**6.** _____, but I'll always cherish[6] our love" she said, putting the photo album away. She decided to focus on the positive memories.With a smile, Lily turned off the radio and stepped outside. The sun was shining, and she felt a sense of renewal[7].

---

[1] quiet= ruhig

[2] sigh= seufzt

[3] move away= umziehen

[4] reminisce= sich erinnern

[5] whisper= flüstern

[6] cherish= wertschätzen

[7] renewal= Erneuerung

Exercise No. 2 (10 minutes)- Pair work
Instructions

1. *Write* a short text (at least 50 words) about Emily's adventure.
2. *Start* with the given[8] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I'm so sick of love songs, so sad and slow - so tired of tears - so done with wishing - you were still here - so why can't I turn off the radio?

Songs from the Magic Forest

In a magical land, there was a girl named Emily. She went into a special forest where the trees made music. As she walked, the forest played a sad tune that made her feel …

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed your work and checked it?
Pick up the "for fast finishers card" from the teacher's desk.

Feel free to use this space to write your notes

[8] given= vorgegeben

Worksheet for Fast Finishers (song/ lyric 8 of box 3) **VIV 6__ __** **__.__.202_**

Exercise No. 3

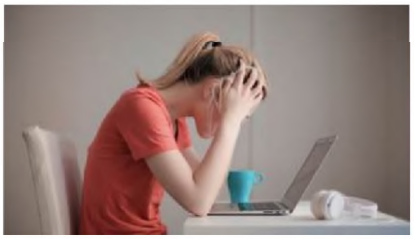
Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. After a long day at school, Sarah sighed[9], "_____. I just want to go back home and take a rest".

a) so tired of tears
b) so done with wishing
c) so why can't I turn off the radio?

2. Mark, feeling sad after having broken up with his girlfriend, sighed, "I'm _____".

a) so tired of tears
b) I'm so sick of love songs, so sad and slow
c) so why can't I turn off the radio?



3. Jenny was angry because her old laptop had a problem, and she said,"_____. I should buy a new one!".

a) so done with wishing
b) why can't I turn off the radio?
c) so tired of tears

4. Jason, tired of wasting time waiting for his ex-girlfriend to forgive him, said, "_____, but now I am alone".

a) you were still here
b) I'm so sick of love songs, so sad and slow
c) so done with wishing

5. Rachel looked at her blank painting and thought "_____". She hoped for inspiration.

a) so done with wishing
b) I'm so sick of love songs, so sad and slow
c) you were still here

6. Tom needed to do his English homework, but he couldn't turn off the radio. It didn't seem to work and music continued playing. Tom asked his friend "_____".

a) I'm so sick of love songs, so sad and slow
b) why can't I turn off the radio?
c) you were still here

7. After Tom's girlfriend left him, he felt very sad for a while. After a few months, he thought "I'm _____" and decided to take control of his life again.

a) so sick of love songs, so sad and slow
b) you were still here
c) so tired of tears



[9] sigh= seufzen

Help card (song/ lyric 8 of the box 3) **VIV 6 __** **__._.2023**



Look at the picture below[10] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting phrases in your text:

1. Emily really wanted to know where the sad music was coming from, so she decided to go further into the forest…

Emily wollte unbedingt wissen, woher die traurige Musik kam, also beschloss sie, weiter in den Wald zu gehen…

2. Along the way, she encountered three other friends that…

Auf dem Weg dorthin begegnete sie drei weiteren Freunden, die…

3. The friends found a secret open area with a magic fountain…

Die Freunde fanden einen geheimen offenen Bereich mit einem magischen Brunnen...

4. "In the end, the sad tune has changed into something beautiful" said Emily and…

"Aber diese Melodien haben sich in etwas Schönes verwandelt", sagte Emily und...

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[10] below= unten

Lexical Test of Box 3 (30 minutes) **VIV 6 __** **__.__.202__**

Write your code here: _____

Exercise No. 1

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I want it all - some people want it all - I don't want nothing at all - now I'm all gone - I thought you'd always be mine

The Secret of Happiness[1]

In a quiet town lived a guy whose name was Tom. He had everything in his life: a nice house, a lovely dog, a cool car, a beautiful girlfriend, but he was still unhappy. He was always thinking "What is missing in my life? **1.** _____ but what does 'all' mean? What could I do to change my life?".

He decided to speak with his girlfriend, Bella, and one day they met at a cafe. "I have been thinking for a while. I really want to be happy, but I always want more of what I have and that makes me unhappy".

Bella responded "**2.** _____, and one time I was one of them. After many years of reflection[2], I understood that everything means nothing. The secret of happiness is to appreciate[3] what you have and not always look for more. At this moment in my life, for example, I **3.** _____ and I feel happy. I think you should stay alone for a while and spend time without me in order to appreciate having me near you".



Tom was surprised and shocked by the words of his girlfriend and responded, "**4.** _____. I was unhappy before but **5.** _____". Bella answered, "I will wait for you, but for now, you need to reflect alone and spend some time with your thoughts".

[1] happiness= Glück

[2] reflection= Überlegung

[3] appreciate= schätzen

1

Lexical Test of Box 3 (30 minutes) VIV 6 __ __.__.202__

Write your code here: _____

Exercise No. 2

Instructions

1. *Write* a short text (at least 50 words) about the friend group's adventure.
2. *Start* with the given[4] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

you light up my world like nobody else - you make me feel like I'm living a teenage dream - let's run away - this feeling's like no other - I want you to know

A Teenage Dream Adventure

In a small town, four friends packed their bags and started an adventure…

Now it's your turn to continue the story using the multi-word units in the box and your imagination.

Have fun writing ✍

_____

_____

_____

_____

_____

_____

_____

_____

_____

Feel free to use this space to write your notes

_____

_____

_____

_____

_____

[4] given= vorgegeben

Multi-word Units of the Box 7

Song/ Lyric 1	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. Don´t stop 2. Make it pop 3. Tik tok, on the clock 4. You got me 5. D.J. you build me up, you break me down	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 2	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. This has gotta to be the good life 2. This could be really be a good life 3. I got this feeling that you can't fight 4. Like this city is on fire tonight 5. What there's to complain about	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 3	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. Be my mirror 2. For some reason I can't explain 3. Once you go there was never an honest word 4. That was when I ruled the world 5. I hear bells a ringing, choirs are singing	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 4	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. So we can work to work it out 2. I promise you that 3. I just haven't met you yet 4. And now I can see every possibility 5. I give so much more than I get	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 5	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. What time is it? 2. Summertime, it's our vacation 3. Time of our lives 4. That's right, say it aloud 5. Schools out, scream and shout	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 6	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. Let's not start a fight 2. It's not worth the drama 3. For a beautiful liar 4. Can we laugh about it? 5. We can live without him	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 7	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. I won't let you go 2. And if there's love, just feel it 3. And if there's life, we'll see it4. This is not time to be alone 5. Just take my hand and hold it	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Song/ Lyric 8	Names of group members	Multi-Word Units to be presented	Date of Presentation
1. I am lost 2. I am vain 3. I will never be the same without you 4. Without you 5. I can't (win/ reign/ run/fly/ quit/ take/ look)	**Coach**:_____ **Others**: _____ _____ _____	1._____ 2._____ 3._____ 4._____ 5._____	_____

Songs of box 7	Tempo (BMP)	Length of the song (min:sec)	Speech rate (wps)	Mean speed (wpm)	Weightage of features
Tik Tok	120.2	3:21	2.3	250.81	0.58
Good Life	127.7	4:13	2.76	101.73	0.57
Viva la Vida	128.2	4:03	1.82	139.02	0.51
Haven't Met you yet	122.6	4:04	1.91	92.21	0.46
What Time is It?	116.1	3:18	2.31	119.39	0.44
Beautiful Liar	91.4	3:27	2.01	170.25	0.4
I won't Let You Go	105.6	3:48	1.44	83.68	0.33
Without You	128.1	3:28	0.95	52.21	0.3
Total	939.9	29:02	15.5	306.14	**3.59**

Song title	Lexical items with lexical frequency	Multi-word units to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Tik Tok	(a) up (17) (b) stop (12) (c) got (9) (d) you (9) (e) pop (6)	(a) Don´t stop (6) (b) Make it pop (6) (c) Tik tok, on the clock (6) (d) You got me (4) (e) DJ you build me up, you break me down (2)	A1/ A2 (sunlight= B1)	Personal life: - holidays - weekend - school - birthday - summer - illness - weather forecast	1 2 3 4 5
Good Life	(a) good (27) (b) life (21) (c) this (18) (d) I (16) (e) a (13) (f) be (13) (g) to (13) (h) the (11)	(a) This has gotta to be the good life (6) (b) This could really be a good life (6) (c) I (…) got this feeling that you can't fight (3) (d) Like this city is on fire tonight (3) (e) What theres to complain about (2)	A1/ A2	Job orientation & personal life: - holidays - weekend - summer - future plans - descriptions of people and things - trip to the country	1 2 3 4 5

Song title	Lexical items with lexical frequency	Multi-word units to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Viva La Vida	(a) I (19) (b) my (14) (c) a (9) (d) in (6) (e) be (4) (f) for (4) (g) never (4) (i) a ringing (3) (j) an honest (3)	(a) Be my mirror (3) (b) For some reason I can't explain (3) (c) Once you go there was never an honest word (3) (d) That was when I ruled the world (3) (e) I hear (…) bells a ringing (…), choirs are singing (3)	A1/ A2	Job orientation: - holidays - weekend - school - birthday - summer - future plans - trip to the country	1 2 3 4 5
Haven't Met You Yet	(a) I (43) (b) and (18) (c) you (17) (d) it (14) (e) so (12) (f) work (11) (g) get (10) (h) out (10) (i) we can (5)	(a) So we can work to work it out (3) (b) I promise you (…) that (5) (c) I just haven't met you yet (6) (d) And now I can see every possibility (2) (e) I give so much more than I get (5)	A1/ A2	Job orientation: activities - holidays - weekend - summer - hobbies - future plans - arrangement	1 2 3 4 5
What Time Is It?	(a) it (36) (b) is (´s) (26) (c) time (24) (d) what (1) (e) our (10) (f) school's out (4) (g) scream and shout (3)	What time is it? (12) Summertime, it's our vacation (3) Time of our lives (3) That's right, say it aloud (3) School's out, scream and shout (3)	A1/ A2	Education/ school: - holidays - school - summer - hobbies - future plans	1 2 3 4 5
Beautiful Liar	(a) not (12) (b) a (11) (c) it (11) (d) we (9) (e) beautiful (7) (f) can (7) (g) liar (7) (h) worth (7)	(a) Let's not start a fight (b) It's not worth the drama (c) For a beautiful liar (d) Can we laugh about it? (e) We can live without him	A1/ A2 (worth = B1)	Job orientation: - describing people and things - school - shopping list - arrangement	1 2 3 4 5
I won´t Let You Go	(a) you (27) (b) will not (won't) (24) (c) let (22) (d) go (19) (e) and (14) (f) I (14) (g) it (11) (h) alone (10) (i) is (´s) (10)	(a) I won't let you go (9) (b) And if there's love, just feel it (5) (c) And if there's life, we'll see it (5) (d) This is not time to be alone (5) (e) Just take my hand and hold it (2)	A1/ A2	Personal life: - holidays - weekend - school - birthday - summer - future plans - descriptions of people	1 2 3 4 5

Song title	Lexical items with lexical frequency	Multi-word units to learn (learning objectives)	CEFR	Topic & Subtopic	Unit
Without You	(a) you (39) (b) I (27) (c) without (23) (d) can (10) (e) am (4) (f) lost (2) (g) never (4) (h) be (3)	(a) I am lost (2) (b) I am vain (2) (c) I will never be the same without you (2) (d) Without you (21) (e) I can't (win/ reign/ run/fly/ quit/ take/ look) (8)	A1/ A2	Personal life: - illness - descriptions of people and things	1 2 3 4 5

Worksheet 1 (song/ lyric 1 of box 7) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

don't stop - make it pop- tik tok, on the clock - you got me - DJ you build me up, you break me down

The Birthday Party Surprise



Last weekend, my friends and I **1.** _____ _____ talking about organizing a surprise dance party for the birthday of our friend Jake. We wanted to **2.** _____ and planned everything carefully. We decorated[1] the room with colorful lights and put up a "Happy Birthday" banner.

We waited for midnight and brought Jake into the room with the lights off. Suddenly we switched[2] the lights on. Jake was so surprised and said, "Wow, what's going on?!" We replied, "It's your birthday dance party!". The DJ said into the microphone: "**3.** _____ it's midnight and it´s your birthday, dear Jake". "I did not expect all that, **4.** _____ completely in the dark about this whole surprise" said Jake.



The party started and everyone danced. The DJ was not the best one. He played happy songs and then sad ones. Jake got upset and told him "**5.** _____. Can you play only happy songs? Today is my birthday and I want to enjoy it. Only happy songs. Leave the sadness[3] for another day". "Sure" answered the DJ and that was what he did for the rest of the party. The dance floor was filled with laughter, and everyone joined in for a group dance. Jake thanked us for the amazing surprise and said it was the best birthday ever.

[1] decorate= dekorieren

[2] switch= einschalten

[3] sadness= Traurigkeit

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about the adventure of a group of friends.
2. *Start* with the given[4] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

don't stop - make it pop- tik tok, on the clock - you got me - DJ you build me up, you break me down

Dance Party Delight[5]

After school, we met up in the park to have a dance competition[6]. The music played, and we couldn't stop moving.…

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[4] given= vorgegeben

[5] delight= Freude

[6] competition= Wettbewerb

Worksheet for Fast Finishers (song/ lyric 1 of box 3) **VIV 6__ __** **__.__.202_**
Exercise No. 3
Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. After the school bell rang, we decided to _____ and have a dance party in the classroom.
a) don't stop
b) make it pop
c) tik tok, on the clock



2. When our favorite song played, everyone shouted, "_____!" and we started to dance.
a) tik tok, on the clock
b) you got me
c) DJ you build me up, you break me down

3. Our weekend plan was to _____ and create a dance video for fun.
a) don't stop
b) make it pop
c) tik tok, on the clock

4. The party started with a familiar beat, and soon enough, we were all dancing to the rhythm of the song "_____" by Kesha.
a) don't stop
b) tik tok, on the clock
c) DJ you build me up, you break me down

5. The party atmosphere was electric as the DJ prepared a playlist using music to _____ for an unforgettable[7] night.
a) don't stop
b) build us up and break us down
c) tik tok, on the clock

6. The wedding was a dance marathon, with the DJ using music to _____ for sentimental moments in the celebration[8].
a) you got me
b) don't stop
c) build up and then break it down

7. The karaoke night turned into a lively sing-along; when my favorite song started playing, "_____" I said and I started to sing with the others.
a) don't stop
b) you got me
c) DJ you build me up, you break me down



[7] unforgettable= unvergesslich

[8] celebration= Feier



Help card (song/ lyric 1 of box 3) **VIV 6 __** **__._.202_**

Look at the picture below[9] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting sentences in your text:

1. Everyone danced in their best way, trying to…

Jeder tanzte auf seine Art und Weise und versuchte.....

2. The DJ played fun songs that made us all feel the rhythm…

Der DJ spielte lustige Lieder, die uns alle den Rhythmus spüren ließen...

3. The sun was shining, and we laughed loudly in the park…

Die Sonne schien, und wir lachten laut im Park…

4. We had so much fun that we decided to make it…

Wir hatten so viel Spaß, dass wir beschlossen haben, es zu einem...

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[9] below= unten

Worksheet 1 (song/ lyric 2 of box 7) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

this has gotta to be the good life - this could really be a good life - I got this feeling that you can't fight - like this city is on fire tonight - what there's to complain about

Sunshine and Smiles: A Day of Fun

"**1.** _____" was the motto of a group of friends who were looking for happiness and lightness[1] in the little things of life. One day they decided to take a day off from their routine and set out on a journey.



They found a nice place in the mountains and started to have a pillow fight[2]. But after 10 minutes, one of them felt very tired and stopped in the middle of the game. The team captain asked for a time-out and told him "**2.** _____anymore. Is it OK with you if I replace you?". "Sure". The others continued playing with the new player until it rained.

When the rain stopped the friends decided to explore a nearby town. On the way to the town, they saw many golden lights illuminating the town, and one friend exclaimed, "How beautiful is this view of the city, **3.** _____! ". They ate delicious desserts and bought souvenirs.



As the day ended, they sat around a bonfire[3]. Looking at the stars, a friend said, "Please tell me **4.** _____. I wish for many days like these because **5.** _____: a few days off and good friends to have fun with".

[1] lightness= Leichtigkeit

[2] pillow fight= Kissenschlacht

[3] bonfire= Feuer

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about the adventure of a group of friends.
2. *Start* with the given[4] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

this has gotta to be the good life - this could really be a good life - I got this feeling that you can't fight - like this city is on fire tonight - what there's to complain about

Happy Days

In a little town, where every day was fun, a group of inseparable[5] friends was in search of true happiness….

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[4] given= vorgegeben

[5] inseparable= untrennbar

Worksheet for Fast Finishers (song/ lyric 2 of box 7) **VIV 6__ __** **__.__.202_**
Exercise No. 3
Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. The sun is shining[6], and the friends are having a picnic in the park. One friend says, "_____".
a) I got this feeling that you can't fight
b) like this city is on fire tonight
c) what there's to complain about

2. The students are excited about the school trip. One friend exclaims, "_____".
a) this could really be a good life
b) I got this feeling that you can't fight
c) like this city is on fire tonight



3. On a camping trip, the friends see a beautiful sunset[7] of a city full of lights. Someone says,"Look at these lights, it seems _____".
a) like this city is on fire tonight
b) this has gotta to be the good life
c) what there's to complain about

4. The family is enjoying a delicious dinner together. The father smiles and says, "_____".
a) what there's to complain about
b) I got this feeling that you can't fight
c) like this city is on fire tonight



5. A group of friends were having a snowball[8] fight. One of them fell to the ground and could no longer get up. Another told him "_____".
a) what there's to complain about
b) I got this feeling that you can't fight
c) this has gotta to be the good life

6. While enjoying a sunny day at the beach, the friends exclaimed, "_____".
a) this has gotta to be the good life
b) I got this feeling that you can't fight
c) like this city is on fire tonight

7. While exploring a pretty little town on their holiday, the friends looked around and thought, "Exploring all the beautiful cities of the world…_____".
a) I got this feeling that you can't fight
b) this could really be a good life
c) what there's to complain about

---

[6] shine= leuchten

[7] sunset= Sonnenuntergang

[8] snowball= Schneeball

Help card (song/ lyric 2 of box 7) **VIV 6 __** **__._.202_**



Look at the picture below[9] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting sentences in your text:

1. One sunny day, the friends decided to explore a mysterious forest nearby…

An einem sonnigen Tag beschlossen die Freunde, einen geheimnisvollen Wald in der Nähe zu erkunden…

2. They thought secret treasures were waiting for them in the middle of the trees…

Sie dachten, mitten in den Bäumen würden geheime Schätze auf sie warten...

3. Amazed by the beauty of …, one friend exclaimed,…

Erstaunt über die Schönheit von ..., sagte ein Freund,…

4. They didn't know their adventure.…

Sie wussten nicht, dass ihr Abenteuer...

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[9] below= unten

Worksheet 1 (song/ lyric 3 of box 7) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

be my mirror - for some reason I can't explain - once you go there was never an honest word - that was when I ruled the world - hear bells a-ringing (…) choirs are singing

The Magical Mirror



Once upon a time in an enchanted[1] forest, there was a magical mirror. Everyone wanted to have this mirror and discover[2] its secret power.

"**1.** _____", the old wizard[3] said, "I also have magical powers and together we can become the strongest in the world". The mirror said no to everyone and didn't show its magic to anyone. Then, one day, a curious[4] kid got lost in the forest and found the magic mirror.

Emma, enchanted by the magic mirror asked the mirror where she was and how she could come back home. For some reason, the mirror showed not only the path to go back home but showed a magical land beyond the mirror's surface as well. Emma stepped through and **2.** _____ Roman cavalry[5] _____".

She continued her journey and met the old king and queen of Jerusalem, who told her "We live stuck in time[6] inside the mirror.What you hear and see is, **3.** _____, before the Romans invaded my kingdom[7]. I lost everything". The queen then continued "**4.** _____ for us and for our kingdom. The Romans are destroying everything here".

Emma asked "but why do you not fight to take back your Jerusalem?". "**5.** _____ it……I am sad and unmotivated, I need a magic help".

---

[1] enchanted= verwunschen

[2] discover= entdecken

[3] wizard= Zauberer

[4] curious= neugierig

[5] cavalry= Kavallerie

[6] stuck in time= in der zeit steckenbleiben

[7] kingdom= Königreich

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about the reconquest[8] of Jerusalem.
2. *Start* where the story of the previous exercise ended and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

be my mirror - for some reason I can't explain - once you go there was never an honest word - that was when I ruled the world - I hear bells a ringing, choirs are singing

The reconquest of Jerusalem

Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[8] reconquest= Rückeroberung

Worksheet for Fast Finishers (song/ lyric 3 of box 7) **VIV 6__ __** **__.__.202_**

Exercise No. 3

Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. Emma, enchanted[9] by the magic mirror, said, "_____!".
a) for some reason I can't explain
b) be my mirror
c) that was when I ruled the world

2. The old king and queen of Jerusalem told Emma, "We live stuck in time inside[10] the mirror. _____ why".
a) I hear bells a-ringing, choirs are singing
b) for some reason I can't explain
c) once you go, there was never an honest word



3. The queen replied, "For some reason I can't explain... _____".
a) I hear bells a-ringing, choirs are singing
b) that was when I ruled the world
c) once you go, there was never an honest word

4. Back in high school, I was the captain of the soccer team. _____.
a) that was when I ruled the world
b) once you go there was never an honest word
c) for some reason I can't explain

5. In the golden age of my career, I led a successful[11] company. _____.
a) that was when I ruled the world
b) once you go there was never an honest word
c) for some reason I can't explain

6. She decided to resign[12] from her job, and _____ about the true reasons behind her decision.
a) that was when I ruled the world
b) for some reason I can't explain
c) once she left, there was never an honest word

7. Attending the Christmas carnival, people were happy as the church bells rang, and I _____ in perfect harmony.
a) heard bells a-ringing, choirs are singing
b) for some reason I can't explain
c) once she left, there was never an honest word



[9] enchanted= verzaubert

[10] stuck in time= in der zeit steckenbleiben

[11] successful= erfolgreich

[12] resign= zurücktreten



Help card (song/ lyric 3 of box 7) **VIV 6 __** **__._.202_**

Look at the picture below[13] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting sentences in your text:

1. Filled with determination, Emma decided to help the king and queen. She asked the mirror for…

Voller Entschlossenheit beschloss Emma, dem König und der Königin zu helfen. Sie bat den Spiegel um…

2. The mirror showed her a map…

Der Spiegel zeigte ihr eine Karte...

3. Along the way, they encountered friendly magical creatures that offered their…

Unterwegs trafen sie auf freundliche magische Kreaturen, die ihnen ihre…

4. With the magical sword in hand, Emma returned to the king and queen. She said, "Together, we can.…

Mit dem magischen Schwert in der Hand kehrte Emma zum König und zur Königin zurück. Sie sagte:

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[13] below= unten

Worksheet 1 (song/ lyric 4 of box 7) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

so we can work to work it out - I promise you that - I just haven't met you yet - now I can see every possibility - I give so much more than I get

The Perfect Friendship

Once upon a time[1], in a small town, there was a sad boy named Tim. He always felt a bit lonely[2] and hoped for a friend. One day, a new girl, Lily, moved to town. Tim was nervous but decided to speak with Lily.

He asked her "Do we know each other?" Lily was kind and answered, "**1.** _____. Let's have a coffee together". Drinking coffee together, Tim and Lily discovered shared interests. As their friendship grew Tim promised Lily, "**2.** _____. At the same time, I hope you'll do the same". Lily "**3.** _____ I will always be on your side".

Tim's once sad world changed, and he said "**4.** _____ for happiness with you, dear Lily". One day, Tim had a problem with his homework and asked Lily for help. Lily had a look at the homework and told him "**5.** _____: We can do the homework tomorrow after school together in the library of the school? What do you think?". "Deal! Thanks in advance". Lily helped Tim with his homework and they spent a lot of afternoons together, exploring[3] the town, laughing, and dreaming about the future.



Tim and Lily's friendship became an inspiration for the entire town, showing that sometimes, unexpected[4] friendships bring the most joy[5], and promises of working it out come to life.

[1] Once upon a time= Es war einmal

[2] lonely= einsam

[3] explore= erkunden

[4] unexpected= unerwartet

[5] joy= Freude

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about Mia and Sam's adventure.
2. *Start* with the given[6] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

so we can work to work it out - I promise you that - I just haven't met you yet - now I can see every possibility - I give so much more than I get

New Friends, New Adventures

In a small village, two kids, Mia and Sam, started a new school year, hoping that…

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[6] given= vorgegeben

Worksheet for Fast Finishers (song/ lyric 4 of box 7) **VIV 6__ __** **__.__.202_**

Exercise No. 3

Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. I hope we become good friends someday because_____.
a) so we can work to work the challenges out
b) I give so much more than I get
c) I just haven't met you yet

2. When my sister felt sad, I told her "_____ to resolve[7] your problem. Please let me help you".
a) I promise you that
b) I give so much more than I get
c) now I can see every possibility



3. During my marriage[8], I said "_____ I will spend the rest of my life with you".
a) so we can work to work it out
b) I just haven't met you yet
c) I promise you that

4. At the beginning of a school project, I told my work group "We should split[9] the tasks; each of us does one task. _____".
a) so we can work to work it out
b) I promise you
c) I just haven't met you yet

5. There are endless opportunities waiting for me, and incredible experiences just near you but _____.
a) I just haven't met you yet
b) so we can work to work it out
c) I give so much more than I get



6. In our group, teamwork is important, and _____ for the success of everyone.
a) I give so much more than I get
b) now I can see every possibility
c) I just haven't met you yet

7. Overcoming[10] hard times opened my eyes, and _____ for a better future.
a) I promise you that
b) I just haven't met you yet
c) now I can see every possibility

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[7] resolve= lösen

[8] marriage= Hochzeit

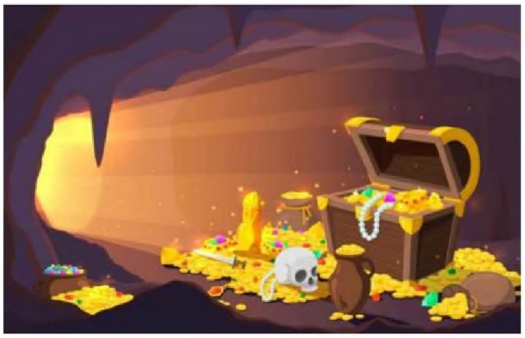
[9] split= aufzuteilen

[10] Overcome= überwinden

Help card (song/ lyric 4 of box 7) **VIV 6 __** **__._.202_**



Look at the picture below[11] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting sentences in your text:

1. Mia and Sam walked around the school together and found…

Mia und Sam gingen gemeinsam durch die Schule und fanden…

2. The three friends decided to form a club to discover all the possibilities for…

Die drei Freunde beschlossen, einen Club zu gründen, um alle Möglichkeiten für...

3. Lily had an idea: let's look for hidden treasures in the school…

Lily hatte eine Idee: Lass uns nach versteckten Schätzen in der Schule suchen…

4. The time at school was like a really special adventure with friends.…

Die Zeit in der Schule war wie ein ganz besonderes Abenteuer mit Freunden…

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[11] below= unten

Worksheet 1 (song/ lyric 5 of box 7) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

what time is it? - summertime, it's our vacation (2 times) - time of our lives - that's right, say it aloud - school's out, scream and shout (2 times)

A Summer to Remember



As the final school bell of the year rang, a student couldn't contain his excitement[1] thinking of vacation and exclaimed, "**1.** _____!" The teacher, with a smile, responded, "**2.** _____ again!" The student joyfully shouted, "**3.** _____!"

The rest of the students with happy and excited faces, asked, "**4.** _____" The teacher checked the clock and replied, "It's 2:30 pm; **5.** _____!". Summer vacation starts now."

With backpacks[2] filled with snacks and sunscreen[3], the students thought "It's time to start a summer adventure and make it the **6.** _____!". The day was filled with laughter, games, and fun adventures. As the sun reached its highest point, they enjoyed the happiness of summertime.



In the afternoon, they found themselves at a beautiful beach. A student repeated what he said in the morning said: "**7.** _____**!**". They splashed in the waves and built sandcastles. As evening approached[4], they gathered around a bonfire[5], the warmth of the fire matching the warmth of their newfound friendships.

[1] excitement= Aufregung

[2] backpack= Rucksack

[3] sunscreen= Sonnenschutzmittel

[4] approach= kommen

[5] bonfire= Feuer

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about the end of the school year.
2. *Start* with the given[6] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

what time is it? - summertime, it's our vacation - time of our lives -
that's right, say it aloud - school's out, scream and shout

School's Out Celebration

As the school bell rang to end the year, a happy student shouted,…

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[6] given= vorgegeben

Worksheet for Fast Finishers (song/ lyric 5 of box 7) VIV 6__ __ __.__.202_
Exercise No. 3
Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. "Hey, look at your watch! Can you tell me,_____".
a) that's right, say it aloud
b) what time is it
c) summertime, it's our vacation



2. "Let's celebrate, it's _____. The best time for our vacation!".
a) that's right, say it aloud
b) school's out, scream and shout
c) summertime

3. "This summer will be the _____, full of fun and adventures!".
a) time of our lives
b) summertime, it's our vacation
c) school's out, scream and shout

4. "Get ready for the _____ during this fantastic vacation!".
a) school's out, scream and shout
b) summertime, it's our vacation
c) time of our lives

5. When you agree, don't be shy – just _____.
a) summertime, it's our vacation
b) say it aloud, that's right!
c) time of our lives

6. The bell rang, and _____. Time to scream and shout with joy!
a) time of our lives
b) that's right, say it aloud
c) school's out



7. Let's celebrate the end of school- _____!.
a) that's right, say it aloud
b) schools out, scream and shout
c) what time is it

Help card (song/ lyric 5 of box 7) **VIV 6 __** **__._.202_**



Look at the picture below[7] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting sentences in your text:

1. The students rushed out of the school, shouting,…

Die Schüler stürmten aus der Schule und schrien,…

2. They felt the warmth of the sun on their faces, realising it was summertime, and…

Sie spürten die Wärme der Sonne auf ihren Gesichtern und merkten, dass es Sommer war...

3. With smiles on their faces, they asked each other…

Mit einem Lächeln im Gesicht fragten sie sich gegenseitig…

4. They decided to spend the first day playing.…

Sie beschlossen, den ersten Tag mit Spielen zu verbringen…

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[7] below= unten

Worksheet 1 (song/ lyric 6 of box 7) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

let's not start a fight - it's not worth the drama - beautiful liar - can we laugh about it? - can live without

Tim, Sarah and the Broken Toy

In a quiet town, Tim and Sarah, experienced[1] the good and bad parts of their relationship. One day, Tim accidentally[2] broke Sarah's favorite toy and Mark saw the incident[3]. Tim didn't have the courage[4] to say it to Sarah. The day after Sarah found the broken toy and started crying. She asked Tim "Do you know who broke my favorite toy?". Tim was scared and said "No, I don't" and ran away. Sarah also asked Mark the same question and he admitted "Tim accidentally broke it".



Sarah was sad because Tim lied to her and decided to speak with Tim again. She asked him "Do you have to tell me something", "Yes, I do but **1.** _____, please. I accidentally broke your favorite toy", Sarah, "I knew it. We will not fight, **2.** _____ but I want you to to promise me that you will not lie to me anymore". "I promise" said Tim. Sarah exclaimed ironically[5] "**3.** _____... I forgive you".

Tim smiled warmly and asked, "So, **4.** _____?". They laughed about the broken toy, knowing their love could overcome[6] small problems.



After some days, Sarah discovered she **5.** _____ the broken toy. The incident taught them that overcoming problems together made their relationship stronger, and they spent each day with laughter and understanding.

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[1] experience= erleben

[2] accidentally= versehentlich

[3] incident= Unfall

[4] courage= Mut

[5] ironically= ironischerweise

[6] overcome= überwinden

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about the lost necklace.
2. *Start* with the given[7] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

let's not start a fight - it's not worth the drama - beautiful liar -
can we laugh about it? - can live without

The Lost Necklace

On a sunny day in the little town of Meadowville, Lily and Tom had a problem when Lily lost Tom's favorite necklace…

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[7] given= vorgegeben

Worksheet for Fast Finishers (song/ lyric 6 of box 7) **VIV 6__ __** **__.__.202_**
Exercise No. 3
Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. After the disagreement[8], Sarah suggested, "_____; it's better to talk calmly[9] and understand each other".
a) let's not start a fight
b) for a beautiful liar
c) can we laugh about it?

2. Jake decided not to discuss the game with his friend; he thought, "_____; we can find a solution together".
a) for a beautiful liar
b) it's not worth the drama
c) we can live without him

3. Jenny, fascinated[10] by mystery novels, enjoyed reading about her favorite character who was described as a _____.
a) can we laugh about it?
b) it's not worth the drama
c) beautiful liar

4. After the funny mix-up[11], Tom asked his sister, "_____ It was just a silly mistake".
a) for a beautiful liar
b) can we laugh about it?
c) we can live without him

5. When their old toy broke, Lily reassured[12] her younger brother, saying, "Don't worry; _____ . Let's find new toys to play with".
a) we can live without him
b) for a beautiful liar
c) can we laugh about it?



6. Before the big game, the coach reminded[13] the team, "_____ with the opponents; sportsmanship is essential".
a) can we laugh about it?
b) let's not start a fight
c) for a beautiful liar

7. After the fight, Sarah thought to herself, "_____. I'll apologise and make things right.
a) it's not worth the drama
b) let's not start a fight
c) for a beautiful liar

---

[8] disagreement= Meinungsverschiedenheit

[9] calmly= ruhig

[10] fascinated= fasziniert

[11] mix-up= Durcheinander

[12] reassure= beruhigen

[13] remind= erinnern

Help card (song/ lyric 6 of the box 7) **VIV 6 __** **__._.202_**



Look at the picture below[14] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting sentences in your text:

1. Lily and Tom started searching everywhere in Meadowville. They …

Lily und Tom begannen, überall in Meadowville zu suchen. Sie…

2. Tom tried to stay calm, telling Lily, "…

Tom versuchte, ruhig zu bleiben und sagte es Lily,...

3. While walking through the park, Tom remembered…

Bei einem Spaziergang durch den Park erinnerte sich Tom…

4. Determined, they continued their search, realising that even without the necklace.…

Entschlossen setzten sie ihre Suche fort und stellten fest, dass sie auch ohne die Halskette…

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[14] below= unten

Worksheet 1 (song/ lyric 7 of box 7) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I won't let you go (2 times)- and if there's love, just feel it - and if there's life, we'll see it - this is not time to be alone (2 times) - just take my hand and hold it

Tim's secret love for Lily

In a small village near London, lived a quiet and shy[1] boy named Tim. Since primary school, Tim liked Lily a lot, but he never told her because he was too shy. As Tim and Lily were about to finish high school, Tim learned that Lily was going to study at Sheffield University, far from their small village. This made Tim feel brave[2], so he decided to tell Lily his true feelings.

"Hey Lily, I want you to know that I love you and **1.**_____!" Tim said. Lily responded, "I knew it and I waited for you to take the first step. I love you as well!".

Because of Lily's words, Tim realised, , "So, **2.**_____. You can also study at London University, and I will move there with you**".** Lily answered, "You're right! **3.**_____. We still have time to decide where I will study but **4.**_____ either! Tim felt really happy because of Lily's words and said "**5.**_____". Holding Tim's hand, she found comfort in his presence. "**6.**_____ forever".



Days turned into weeks, and their bond[3] grew stronger. Lily decided to study at London University and Tim found a job in London in order to stay near Lily. Through ups and downs, they overcame[4] the challenges[5] of growing up together. In moments of difficulty[6], Tim and Lily always said to each other, "**7.**_____ always together". Their love brought them happiness and helped them in hard times, showing that being brave can make a big difference in people's lives.

---

[1] shy= schüchtern

[2] brave= mutig

[3] bond= Beziehung

[4] overcome= überwinden

[5] challenge= Herausforderung

[6] difficulty= Schwierigkeit

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about the magical box.
2. *Start* with the given[7] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I won't let you go- and if there's love, just feel it - and if there's life, we'll see it - this is not time to be alone - just take my hand and hold it

The Magical Box

On a sunny day, Tim and Lily discovered a mysterious box that whispered[8], "This is not the time to be alone…

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[7] given= vorgegeben

[8] whisper= flüstern

Worksheet for Fast Finishers (song/ lyric 7 of box 7) **VIV 6__ __** **__.__.202_**
Exercise No. 3
Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.

1. During the movie, I tell my teddy bear, "_____" so I'm not scared.
a) and if there's love, just feel it
b) I won't let you go
c) this is not time to be alone

2. When your mother gives you a big hug, you can close your eyes and _____.
a) just feel the love
b) I won't let you go
c) this is not time to be alone



3. Looking at the sky, we wonder if there's life on other planets, and maybe one day, _____.
a) we'll see it
b) just feel it
c) this is not time to be alone

4. When you're scared of the dark, remember _____; call a friend or family member.
a) this is not time to be alone
b) if there's love, just feel it
c) I won't let you go

5. When crossing the street, Mom says, "_____ tight[9]"
a) this is not time to be alone
b) I won't let you go
c) just take my hand and hold it



6. If your partner is sad, you can say, "_____ ; we'll face[10] it together".
a) and if there's love, just feel it
b) let's not start a fight
c) and if there's life, we'll see it

7. When we play hide and seek[11], I grab[12] my friend's hand and say, "_____ " so we can find the best hiding spot together.
a) and if there's love, just feel it
b) I won't let you go
c) and if there's life, we'll see it

[9] tight= fest

[10] face= anpacken

[11] hide and seek= Verstecken und Suchen

[12] grab= greifen



Help card (song/ lyric 7 of box 7) **VIV 6 __** **__._.202_**

Look at the picture below[13] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting sentences in your text:

1. Tim was unsure at first, but then he held Lily's hand and felt a nice connection…

Tim war zuerst unsicher, aber dann hielt er Lilys Hand und fühlte eine schöne Verbindung...

2. When they opened the magic box, bright and colorful light appeared all around them…

Als sie die magische Kiste öffneten, erschien um sie herum helles und buntes Licht...

3. The box took them to a pretty garden with animals that could talk…

Die Kiste brachte sie in einen schönen Garten mit Tieren, die sprechen konnten...

4. Holding the map together, they started an adventure with lots of fun…

Sie hielten die Karte zusammen und begannen ein Abenteuer mit viel Spaß...

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[13] below= unten

Worksheet 1 (song/ lyric 8 of the box 7) **VIV 6 __** **__.__.202_**

Exercise No. 1 (10 minutes)- Pair work

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I am lost- I am vain - I will never be the same without you- without you- I can't

Lost and Found Friends



Once upon a time, in a small town, Sarah and Adele decided to go to the Christmas carnival.

Sarah went to the toilet and spent a lot of time adjusting[1] her makeup in front of the bathroom mirror thinking "**1.** _____ but I like to be so". Meanwhile, Adele waited for her outside and met another school friend. The Christmas carnival was so crowded[2] that Sarah could not find Adele anymore after she came back from the toilet, even though Adele was a few metres away from the toilet entrance[3] with the other friend. Adele also had Sarah's mobile phone because she didn't bring her purse[4] but, only her makeup.

Panic set in, and she thought, "**2.** _____". Searching quickly in the busy streets, she realised, "Without her and without my mobile phone, **3.** _____ go back home and I can not call anyone".

Finally, Sarah spotted[5] Adele and exclaimed, "I found you! **4.** _____ I can't believe how lost I felt". Adele added, "Imagine if I had never found you again, if you had disappeared[6] forever...**5.** _____**!**". They hugged each other tightly and promised not to stay always together.

---

[1] adjust= richten

[2] crowded= überfüllt

[3] entrance= Eingang

[4] purse= Handtasche

[5] spot= erblicken

[6] disappear= verschwinden

Exercise No. 2 (10 minutes)- Pair work

Instructions

1. *Write* a short text (at least 50 words) about Billy's favorite toy.
2. *Start* with the given[7] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

I am lost- I am vain - I will never be the same without you- without you- I can't

Billy's Favorite Toy

Billy received a toy for his birthday. It became his favorite toy but one day…

Now it's your turn to continue the text using the multi-word units in the box and your imagination. Have fun writing ✍

Do you need help? Pick up the "help card" on the teacher's desk.

Have you already completed both worksheets and checked them?
If so, pick up the "Worksheet for fast finishers" from the teacher's desk.

Feel free to use this space for your notes

[7] given= vorgegeben

Worksheet for Fast Finishers (song/ lyric 8 of box 7) **VIV 6__ __** **__.__.202_**
Exercise No. 3
Instructions: *Read* each sentence carefully and *mark* with an "X" the right option (a, b or c) to complete the sentence correctly.



1. Once, during a nature hike[8], I wandered off the path, and I felt scared, thinking, "_____".
a) I am vain
b) I am lost
c) I will never be the same without you

2. Every morning, Jake spent a lot of time fixing his hair, thinking, "_____, but I like looking good".
a) I will never be the same without you
b) I can't
c) I am vain

3. Losing her favorite teddy bear, Sarah whispered[9], "_____".
a) I will never be the same without you
b) without you
c) I am vain

4. When playing hide and seek[10], Emma said, "_____, it's not as fun".
a) without you
b) I am vain
c) I will never be the same without you

5. During the soccer game, Lily tried to score[11] a goal but missed, saying, "_____ believe I missed the shot!".
a) I am vain
b) I can't
c) I will never be the same without you



6. Tom wanted to climb[12] the tall tree, but he looked up and said, "_____ do it; it's too high".
a) I am vain
b) I can't
c) I will never be the same without you

7. In the kitchen, Mom felt overwhelmed[13] without her recipe book, saying, "_____ cook dinner without it."
a) Without you
b) I can't
c) I am vain

---

[8] hike= Wanderung

[9] whisper= flüstern

[10] hide and seek= Verstecken und Suchen

[11] score= schießen

[12] climb= klettern

[13] overwhelmed= überfordert

Help card (song/ lyric 8 of box 7) **VIV 6 __** **__._.202_**



Look at the picture below[14] and use it to help you write your text.



Feel free to use the sentences below to write your text.

You can use these starting sentences in your text:

1. It became his favorite toy but one day, he accidentally left it at the park and he…

Es wurde zu seinem Lieblingsspielzeug, aber eines Tages ließ er es versehentlich im Park liegen und er...

2. Searching quickly in the busy streets, he…

Er suchte schnell in den belebten Straßen und...

3. Meanwhile, his friends, noticing Billy's sadness, decided to help him search for the missing toy…

Währenddessen bemerken seine Freunde Billys Traurigkeit und beschließen, ihm bei der Suche nach dem fehlenden Spielzeug zu helfen…

4. Finally, one of the friends spotted the toy near the

Schließlich entdeckte einer der Freunde das Spielzeug in der Nähe des...

You can use these words (linking words) to connect ideas:

1. Firstly, (erstens,)
2. Next, (der nächste,)
3. Then, (dann,)
4. Also, (auch,)
5. In the end, (zum Schluss,)
6. But (aber)
7. And (und)

[14] below= unten

Lexical Test of Box 7 (30 minutes) **VIV 6 __** **__.__.202__**

Write your code here: _____

Exercise No. 1

Instructions

1. *Read* the text below and *fill in* the gaps with the correct multi-word units from the grey box.

2. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

make it pop - this could be really be a good life - for some reason I can't explain - now I can see every possibility - time of our lives

The Magic Piano

Once upon a time in a small town, Mia and Jake discovered an old, dusty[1] piano in their school's music room. With a bit of curiosity[2], they decided to give it a try. Mia started to play some classical melodies but Jake told her "**1.** _____! Play something by Lady Gaga or Billie Eilish". To their surprise, when Mia played *Poker Face* by Lady Gaga, the piano transported them to another world. Mia got scared and stopped playing.

They decide to share their experience with their parents, saying "Hi mum and dad… You cannot imagine what we experienced yesterday. We found a piano with magical power". "What do you mean with magical power?" asked the mother. "**2.** _____ which kind of power it has…this old piano seemed magical because it makes everything come alive". Their parents did not believe them, thinking that they were lying.



The next day Mia and Jake, decide to play the piano again. After a few notes, the piano brought them to a world of vibrant[3] colors and joyful sounds. "**3.** _____, a life in this magical world. Please continue to play, Mia. **4.** _____ that the magical piano offers us: a new life in a. Magical world" Jake said.

Now, in this magical world, Mia and Jake danced with imaginary creatures and sang along. They realised "That is really the **5.** _____". The magical piano filled[4] their hearts with joy, turning their ordinary days into special and magical adventures.

[1] dusty= staubig

[2] curiosity= Neugier

[3] vibrant= lebendig

[4] fill= füllen

1

Lexical Test of Box 7 (30 minutes) **VIV 6 __** **__.__.202__**

Write your code here: _____

Exercise No. 2

Instructions

1. *Write* a short text (at least 50 words) about Sarah's story.
2. *Start* with the given[5] sentence and *use* **all** the multi-word units from the grey box.
3. *Put* the verbs in the **simple past** when necessary (for example "We **do** it" → "We **did** it").

it's not worth the drama - this is not time to be alone - I am lost - I am vain - so we can work to work it out

The Final School Day

As the last school bell rang, signaling the end of the year, Sarah realised she left her mobile phone in the classroom and…

Now it's your turn to continue the story using the multi-word units in the box and your imagination. Have fun writing ✍

Feel free to use this space to write your notes

[5] given= vorgegeben

Can singing pop songs help secondary school learners acquire multi-word units more effectively? This book answers that question through a rigorously designed quasi-experimental study involving approximately 250 students across four schools in North Rhine-Westphalia. Combining vocal training with authentic English pop songs, the intervention targets curriculum-aligned multi-word units while exploring learner well-being and involuntary musical imagery (INMI) as cognitive mechanisms supporting retention.

The study yields a validated 56-song corpus, a multidimensional assessment instrument, a five-phase lesson plan, and a comprehensive pedagogical toolkit ready for classroom use. Findings reveal moderate-to-large within-group learning gains and significantly enhanced well-being during instruction.

Situated at the intersection of music cognition, applied linguistics, and EFL pedagogy, Concert of Learning offers researchers, teachers, and curriculum designers an evidence-based framework for integrating music into language education.

Awarded 3rd Place in the Education & Work category of the *Studierendenpreis für Soziale Innovationen* (StiPS) by the German *Federal Ministry for Research, Technology and Space* (BMFTR) for the project „Unlocking the Pedagogical Potential of Involuntary Musical Imagery“ (AKZ 16SIP02503).

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