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Effects of Internal Migration on the Life Satisfaction of Apprentices

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Abstract

Migration can have far-reaching implications for individuals' life satisfaction (LS). Previous research has mostly examined how migration influences LS using broad samples of the adult population. Moreover, it has not sufficiently considered the influence of other important life events preceding, accompanying, or following migration. Consequently, its conclusions are not readily transferable to individuals in different life stages and their age-specific coupled life events. To narrow this research gap, we examine how migrating within Germany during the transition to vocational education and training (VET) influences the LS trajectories of apprentices. We estimate fixed-effect panel regressions using data from the German National Educational Panel Study (NEPS). Beyond a substantial increase in LS following the transition to VET, we find no significant average effect of VET-related migration on apprentices' LS. However, we observe significant effect heterogeneity: migration to enter higher-status (versus lower-status) occupations and migration to urban (versus rural) regions yield larger (short-term) LS gains for apprentices. These results suggest that, beyond strictly VET-related factors, age-specific lifestyle amenities, which become accessible by moving towards urban regions, moderate the effects of internal migration on LS. Overall, our study illustrates the need to consider the specificity of life stages and coupled life events when analysing the effects of migration on LS.

Keywords Vocational education and training (VET) · Spatial mobility · Intranational migration · Relocation · Life satisfaction · Subjective well-being (SWB) · Fixed-effects regressions · Multiverse analysis

Extended author information available on the last page of the article.

Introduction

Migration can have far-reaching implications for individuals' life satisfaction (LS). A growing body of studies suggests that within-country (so-called internal) migration can increase LS (Erlinghagen et al., 2021; Hendriks & Burger, 2021; Kratz, 2020; Melzer & Muffels, 2017; Nowok et al., 2013).¹ These studies also illustrate that the effects of migration on LS vary depending on the motives for mobility, personal characteristics, and regional context features.

While highly valuable, this body of research can be expanded for at least two reasons: First, existing studies tend to use broad samples of the adult population. Consequently, their conclusions are not readily transferable to individuals in life stages such as childhood, youth, young adulthood, and old age. During middle adulthood, primary motives for migration include the improvement of job prospects and the housing situation as well as family formation (Kley, 2011; Petzold, 2017; Walford & Stockdale, 2015). In earlier or later life stages, however, other motives frame mobility decisions (Coulter & Scott, 2015; Henkens et al., 2024; Switek & Easterlin, 2018), such as securing a suitable apprenticeship. Second, previous studies have not sufficiently considered the potential LS effects of life events preceding, accompanying, or following migration. These events include union initiation and dissolution as well as transitions to other life stages, e.g., to new educational phases, the labour market, or retirement. Such events and transitions will arguably shape the extent to which migration can influence LS. For these reasons, research should more closely examine the effects of migration on LS considering the coupling of migration with age-specific life events characterising these life stages.

Our study addresses this research gap by examining how internal migration within Germany during the school-to-work transition shapes LS trajectories. We focus on the transition to vocational education and training (VET), which is a significant entry point into the labour market for over half of young people in Germany (see the section [Contextualisation: Vocational Education and Training in Germany](#) for details). From a theoretical point of view, VET-related migration constitutes an interesting test case – which has, however, hardly been examined so far. On the one hand, VET-related migration resembles migration in other life stages. For instance, like economic migration in later adult life, it involves an employment-related investment decision based on personal preferences and regional opportunity structures (Thissen et al., 2010). On the other hand, it is characterised by the specificities of the (transition to the) VET life stage, which typically occurs in young adulthood (Schulenberg et al., 2004), and therefore differs from migration during other life stages, including the transition to higher education or the labour market.

What is specific about the transition to the VET life stage? First, individuals are particularly prone to internal migration when transitioning to the VET life stage (Geist & McManus, 2008; Horowitz & Entwisle, 2021; Schäfer & Just, 2018; Stawarz & Rosenbaum-Feldbrügge, 2020), as further elaborated in the section [Contextualisation: Vocational Education and Training in Germany](#). Second, specific

¹Previous research also reports positive effects of international migration on LS (e.g., Bartram, 2013; Genoni et al., 2025).

motives, constraints, and opportunities frame VET-related migration. It can be a necessity to secure a VET position by escaping regions with a scarce offer of suitable VET positions (Hoffmann & Wicht, 2023; S. Matthes & Ulrich, 2016), but also an opportunity to achieve a high occupational status in the long run by allowing access to favourable labour markets (Waibel, 2019; Wicht et al., 2026). Beyond such VET-related considerations, migration can also help young adults gain independence from the parental household and fulfil lifestyle goals (Benson & Furstenberg, 2006). For young adults, in particular, moving towards the amenities of urban regions might boost LS (Schäfer & Just, 2018). Third, VET-related migration can be conceptualised as a coupled life event (Buchmann & Kriesi, 2011; Witte et al., 2023) because individuals need to find a VET position and leave their accustomed spatial environment. The few studies focussing on LS during the transition to the VET life stage – albeit without analysing the role of migration – report a surge in LS following the transition from school to VET (Reuter et al., 2022; Siembab & Stawarz, 2019). At present, it is unclear whether internal migration has separate effects on LS in the face of such a major coupled life event and the many changes both the transition to VET and spatial relocation imply for young adults' lives.

Considering that the transition to VET poses a major change in young adults' life courses and can induce internal migration, we address the following questions: What are the standalone effects of internal migration during the transition to VET on apprentices' LS? And which conditions moderate the size of these effects?

We address these questions by combining a life course perspective with the theory of social production functions (SPF) and rational choice theory (RCT). These approaches allow us to derive hypotheses on how VET-related migration should influence LS on average, and on how this relationship might vary depending on certain conditions, including apprentices' pre-migration VET opportunity structures, status attained through VET, and the type of destination region (rural versus urban). We test our hypotheses using individual-level data from the German National Educational Panel Study (NEPS), which we supplement with regional context data from the German Federal Employment Agency. To tackle selection into VET-related migration, we estimate fixed-effects panel regressions (Brüderl & Ludwig, 2015). We assess the sensitivity of our results to alternative modelling decisions through a multiverse analysis (Steege et al., 2016). Additionally, we examine whether the potential moderating effects of the destination region depend on the pre-migration VET opportunity structures through split-sample analyses. We conclude by discussing the main contributions and limitations of our analyses, which illustrate the need to consider the specificity of coupled life events when examining the effects of internal migration on LS.

Contextualisation: Vocational Education and Training in Germany

In Germany, both pursuing VET (rather than higher education or entering employment directly) and migrating (instead of staying or long-distance commuting) constitute outcomes of a comparatively wide array of options available to school-leavers. This variety allows young adults in Germany to choose which kind of training to pursue

and in which location – more so than in countries with fewer post-secondary training options or with more city-centred training markets. Moreover, the connection between the education system and the labour market is stronger in Germany than in many other countries, such as the US or France (DiPrete et al., 2017). Germany is also characterised by a pronounced regional clustering of economic branches (Kleinert et al., 2018), which creates push and pull factors that influence internal migration decisions. The relatively wide array of options in Germany regarding whether, how, and where to enter VET allow school-leavers to choose among different alternatives and to optimise their choice in ways that maximise their LS. Overall, the features of the German VET system make it a suitable test case for our analyses, which are based on social production functions theory and rational choice theory (see the section [Theoretical Considerations and Previous Research](#)).

In the past, the annual number of entrants to dual and school-based VET programmes in Germany typically ranged from about 733,000 (2005) to 671,000 (2025), thus even exceeding the annual number of entrants to higher education (2005: 356,000; 2025: 492,000; Autor:innengruppe Bildungsberichterstattung, 2026, pp. 164, 204, Tab. E1-1web). To enter VET, students do not necessarily need an educational degree, although most have one (Autor:innengruppe Bildungsberichterstattung, 2026, p. 166). German VET programmes usually last for two or three years (Protsch & Solga, 2016). While not the norm, internal migration is common among VET students: 21.9% of apprentices enter VET in a regional labour market (RLM) different from their home RLM and 16.4% enter VET in their home RLM but outside their home district (Hoffmann & Wicht, 2023).²

Theoretical Considerations and Previous Research

From a life course perspective, individual life courses consist of different life stages (including education, employment, and retirement) and life events (e.g., access to different educational levels, labour market entry, or entry into retirement), which induce transitions between life stages (Bernardi et al., 2019). One major life event is school completion, which, in Germany, is usually followed by a transition to post-secondary education.

²In some respects, the transition to VET is comparable to the transition to higher education in Germany, for example, regarding its timing in the life course. There are, however, substantial differences between the two sectors. First, higher education tends to be concentrated in cities, while VET is available in rural regions as well (Siegler, 2012; Weßling et al., 2015). Second, VET is more closely linked to labour market structures than higher education. VET involves on-the-job training and follows curricula which align closely with occupations (Protsch & Solga, 2016). Third, unlike VET, higher education requires high formal qualifications. Because of these entrance regulations and self-selection patterns, the populations of young adults entering VET and higher education differ regarding their personal characteristics (Hillmert & Jacob, 2010; Kleinert & Jacob, 2019; Schindler & Lörz, 2012). Fourth, spatial mobility rates are higher among students in higher education: Exceeding the above-mentioned shares for VET entrants, 44% of higher education entrants in Germany migrate to another RLM and 25.7% commute to a higher education institution outside their home RLM (Warkotsch & Netz, under review). Overall, the described differences between VET and higher education warrant separate analyses of how migration moderates LS trajectories at the transition to these two sectors.

The transition to post-secondary education is also highly relevant for migration research, as this transition is often coupled with migration, mostly within national borders (Bernardi et al., 2019; Brüderl et al., 2019; Coulter & Scott, 2015; Hoffmann & Wicht, 2023; Vidal & Lersch, 2021). This act of spatial mobility usually constitutes the first self-determined and long-term-oriented internal migration in the life course. As such, it may have a substantial bearing on young individuals' LS trajectories.

In the following, we draw on the theory of social production functions (SPF) and rational choice theory (RCT), which suggest that VET-related migration could, on average, lead to increases in apprentices' LS (see the section [VET-Related Migration as a Means to Improve Life Satisfaction](#)). Additionally, we derive hypotheses on factors moderating the effects of VET-related migration on LS, which helps us carve out the specificity of this form of migration from a life course perspective. The discussed moderating factors include the regional VET opportunities before migration (see the section [Regional VET Opportunities](#)), the occupational status of the VET programme (see the section [Status Attainment](#)), and the type of destination region (rural versus urban, see the section [Type of Destination Region](#)).

VET-Related Migration as a Means to Improve Life Satisfaction

According to SPF theory, individuals strive to improve their subjective well-being (Buijs et al., 2021; Ormel et al., 1999), which we operationalise through overall LS. SPF theory posits that individuals can achieve this highest goal by reaching so-called instrumental goals, which include stimulation/activation, comfort, status, behavioural confirmation, and affection. They can fulfil these instrumental goals by activities and endowments constituting so-called means of production. We argue that VET-related migration can be considered an important means of production: It can grant access to various beneficial activities and endowments fulfilling instrumental goals, thereby eventually increasing LS (Hendriks & Bartram, 2019). However, VET-related migration also tends to confront individuals with a trade-off, as mobile individuals usually need to abandon other means of production available at their current location.

To specify how individuals strive to optimise their subjective well-being, SPF theory relies on RCT (Lindenberg, 1996), according to which individuals regard migration as an investment decision involving expected costs and benefits (Bernardi et al., 2019; Lörz et al., 2016; Sjaastad, 1962). The costs of VET-related migration may involve monetary expenses, e.g., moving costs (Aassve et al., 2007), as well as non-monetary costs, e.g., the separation from family and friends or stress in adapting to new environments (Choy et al., 2021; Hendriks et al., 2016; Thissen et al., 2010). The benefits of VET-related migration may encompass various activities and endowments, including not only access to a (better) VET position but also independence from the parental household and the possibility to develop a personal lifestyle (Schulenberg et al., 2004). According to both SPF theory and RCT, individuals should weigh the monetary and non-monetary costs and benefits of moving to different locations and not moving against each other, and ultimately choose the location promising the highest overall LS (Hendriks & Bartram, 2019). This implies that they should only migrate if they expect the benefits of migration to exceed its costs.

In line with these thoughts, substantial evidence on economically motivated internal migration shows that adults can increase their LS through migration (Erlinghagen et al., 2021; Hendriks & Burger, 2021; Kratz, 2020; Melzer & Muffels, 2017; Nowok et al., 2013). Moreover, first evidence suggests that residential relocations among young adults increase LS (Switek, 2016, for the case of Swedish youth and Perales, 2017, for the case of young adults in the UK and Australia).

Based on these theoretical assumptions and empirical findings, it is plausible that school leavers opt for internal migration during the transition to VET only if they expect their mobility to increase their LS. *Accordingly, we hypothesise positive average effects of VET-related migration on the LS of apprentices (H1).*

The Moderating Role of Regional VET Opportunities, Status Attainment, and Destination Regions

SPF theory posits that individuals' actions should aim at improving their LS (Buijs et al., 2021; Ormel et al., 1999). At the transition to VET, factors like family formation, improving housing conditions, or immediate wage gains are likely less relevant for LS improvements than during later life stages. Instead, training- and lifestyle-related factors should be more important (Geist & McManus, 2008; Vilhelmson & Thulin, 2016), such as overcoming local shortages in the regional VET supply, attaining a high status through high-quality VET, and moving to an urban region. As elaborated in the following, the effects of VET-related migration might vary depending on the aforementioned motives.

Regional VET Opportunities

The VET opportunity structure of the region in which pupils live upon school completion may influence their quality of life by shaping their chances of finding a VET position (S. Matthes & Ulrich, 2016). If VET supply is low, finding an adequate position is more difficult (Jost et al., 2019; Kleinert & Jacob, 2013; Matthes & Ulrich, 2016). Importantly, school leavers can cope with such shortages by extending their search radius and, eventually, by migrating (Hoffmann & Wicht, 2023; Kropp et al., 2007). This implies a compromise between fulfilling their occupational VET aspirations and accepting regionally available opportunities (S. Matthes & Ulrich, 2016). To fulfil their instrumental goals of behavioural confirmation and affection, likely provided by their familiar social environment (Ormel et al., 1999), school leavers can sacrifice specific occupational goals and stay. Alternatively, they can accept the social costs of leaving their home region and thereby attain status, comfort, and confirmation through a suitable VET position, thus increasing their overall LS by obtaining a VET position that meets their aspirations (Etzel & Nagy, 2021).

Migrating school leavers from regions with poor VET opportunity structures could be less satisfied because they are more likely to have to accept potentially high social or monetary costs to fulfil their VET preferences (Eckelt & Schauer, 2019). Coming from a poor VET opportunity structure, they face more difficulties when searching for VET positions and pressure to migrate. School leavers from regions with better VET opportunity structures, on their part, should require more benefits for them to leave

their advantageous region, implying that their migration should result in greater LS gains. *According to this reasoning, the effects of VET-related migration on LS might be smaller for apprentices from regions with poor VET opportunity structures (H2).*

Status Attainment

The occupational status attained through VET may also serve as a motivating factor for VET-related migration and have a significant influence on LS. As achieving a high status can be an important goal for school leavers (Nießen et al., 2022, 2023; Protsch & Solga, 2016), they may be willing to migrate if they are otherwise unable to obtain a high-status occupation (Fielding, 1992; Wicht et al., 2026). Apprentices who secure high-status VET positions through migration are arguably more likely to fulfil their occupational goals and, thus, to perceive migration as beneficial. *Therefore, the effects of VET-related migration on LS might be larger, the higher the status of the attained VET occupation is (H3).*

Type of Destination Region

The decision for VET-related migration may not only be motivated by strictly VET-related reasons but also by broader lifestyle considerations. Leaving the home region allows young adults to detach from their parental household and to live in an environment they have chosen for themselves, so as “to ‘become someone else’ and grow as a person” (Vilhelmson & Thulin, 2016, p. 283). This important step on the way to adulthood could also increase LS (Kins & Beyers, 2010; Otte & Baur, 2008; Schulenberg et al., 2004).

Especially if apprentices move towards regions offering more life stage-relevant amenities, they should experience benefits in multiple life domains and thereby increase their LS. Besides more abundant VET and labour market opportunities, urban regions tend to offer more opportunities to take part in social and cultural life and to establish new social contacts than rural regions (Gans, 2017). In line with these considerations, empirical evidence shows that young adults are particularly likely to migrate towards urban regions (Busch, 2016; Schäfer & Just, 2018). *Against this background, VET-related migration to urban regions might have larger positive effects on LS than VET-related migration to rural regions (H4).*³

Analytic Strategy

Data

We test our hypotheses using data from starting cohort 4 (version 14.0.0) of the German National Educational Panel Study (NEPS Network, 2024). This nationally representative longitudinal survey gathers rich information on 16,425 respondents who were grade 9 students in German schools during the school year 2010/11. The

³This hypothesis is also plausible considering that staying in rural areas may lead to stigmatisation of young adults (Pedersen & Gram, 2018), which might negatively influence their LS.

schools were randomly selected from the total population of regular schools offering lower secondary education. Within each school, respondents were sampled in up to two randomly selected classes.

Between 2010 and 2022, the respondents were invited to participate in fourteen survey waves. The survey waves covered different life stages, from attending school in the teenage years via the transition to post-secondary education to its completion. Thus, the data include students from all educational tracks who experienced different transitions to VET, either directly after obtaining a low or medium secondary degree (after grade 9 or 10), or after obtaining the *Abitur*, the highest general educational degree in Germany (after grade 12 or 13), or indirectly after an intermittent employment, prevocational training, or other gap activity.

We applied some sample restrictions to improve the precision of our estimates: First, we excluded 9,725 individuals who did not enter VET at any point. We also excluded 42 individuals who obtained another professional qualification (e.g., a university degree) before their first VET spell and 17 individuals who were misclassified as apprentices in waves 1 or 2 (when they were still enrolled in secondary school). Furthermore, we only included observations until the (successful or unsuccessful) completion of their first VET spell. After applying these sample restrictions, the full sample contains 6,641 individuals. After listwise deletion, the analytical sample used in the main analyses comprises 17,788 observations for 2,797 individuals (for details, see sections A1 and A2.1 in the online appendix).

Operationalisation

Life Satisfaction Across waves, our dependent variable was consistently measured by asking respondents how satisfied they were overall with their life on a scale from 0 (completely unsatisfied) to 10 (completely satisfied). We used monthly available episode data on individuals' educational trajectories and matched the dates of their VET phases with the interview dates of the general annual surveys. We defined baseline LS as respondents' mean LS more than one year before entering VET and excluded observations relating to the year before entering VET. This reduces the possibility that any positive or negative anticipation of leaving school and entering training biases the baseline measurement. We estimated the effects of VET-related migration using dummies for each training year (first, second, and third year).

VET-Related Migration To measure VET-related migration, we constructed a variable indicating whether apprentices migrated across regional labour markets (RLMs). We used a classification of 141 RLMs by Kosfeld and Werner (2012), designed to capture regions with minimal commuting prevalence between them and maximal commuting prevalence within them. Thus, it identifies spatial units that contain relatively homogeneous labour markets regarding internal migration (Wicht et al., 2019).⁴

⁴On average, these RLMs have a size of about 2,500km² and a population of about 600,000. The geometric centroids of these RLMs are on average about 320km apart (for more details, see Table A4 in the online appendix).

We defined VET-related migration as a change of the primary location of residence from one RLM to another, with the new location of residence being the same as the training location. We defined staying as keeping the primary location of residence in the same administrative district (NUTS-3), with the training location being in the same district as the residence. These definitions provide clearly defined treatment (migrants) and reference groups (stayers), excluding individuals who opted for other forms of spatial mobility (e.g., long-distance commuting, which implies residence in the original RLM while undertaking training in another RLM). According to our definition, 18.2% (N=508) of apprentices in our sample are VET-related migrants (see Table A1 in the online appendix), resembling the numbers reported by Hoffmann & Wicht (2023). The average distance of VET-related migration in our sample is 230 km (standard deviation: 130 km; median: 250 km; calculated based on great-circle distances between RLM centroids).

Poor Regional VET Opportunities To capture the regional VET opportunity structure before entering VET, we constructed a measure that specifically targets the VET market. Using data from the German Federal Employment Agency, we divided the number of registered vacant VET positions in the aspired occupational segment (Matthes et al., 2015) within the RLM of residence one year before entering VET by the size of the age cohort from 15 to 24 in the same RLM and year. While the number of vacancies represents the supply of training positions, the cohort size approximates the number of potential competitors for these vacancies. The constructed scale thus reflects the potential competition for VET positions in the aspired occupation. We inverted the scale to align with our theoretical reasoning and for ease of interpretation. The inverted scale thus ranges from -0.13 (indicating a favourable regional VET opportunity structure with 0.13 vacant positions per potential competitor) to 0 (a poor VET opportunity structure with no vacant position). The variable is z-standardised in our models.

Status Attainment To measure the status of the trained occupation, we used the International Socio-Economic Index of Occupational Status (ISEI-08). Higher values indicate occupations with a higher status. We z-standardised this variable as well.

Type of Destination Region To distinguish between rural and urban destination regions, we used a classification of settlement structure types on the district level (NUTS-3) by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR, 2024). We coded the categories “large cities” and “urbanised districts” as “urban” and the categories “rural districts with agglomeration tendencies” and “scarcely populated rural districts” as “rural”.⁵

⁵ The BBSR (2024) defines “large cities” as cities with a minimum population of 100,000 (e.g., Berlin and Mainz) and “urbanised districts” as administrative districts with a population density of at least 150 inhabitants/km² (e.g., districts surrounding Hamburg and Munich). Both types of “rural districts” have population densities of less than 100 inhabitants/km². For an overview of how the different types of districts are distributed across Germany, see Figure A1 in the online appendix.

Control Variables Limiting our sample to young adults entering VET tailors the sample to a specific life course transition, thereby constraining the influence other events or time-varying covariates may have on LS. To control for age and period effects, we included indicators of age groups (below 16 years, 16 to 17 years, 18 years and older), grouped survey waves (waves 1/2, 3/4, 5/6, 7/8, 9/10, 11, 12/13/14),⁶ and the calendar months in which the data were collected. Moreover, we included indicators of VET cancellation and panel dropout.

Distributions of the variables discussed above are reported in Tables A1 and A2 in the online appendix.

Methods

We applied linear fixed-effects regressions (Brüderl & Ludwig, 2015). These models allow us to control for time-invariant heterogeneity, thereby improving the approximation of causal effects of VET-related migration on LS. By splitting the VET period into years using dummy variables (first, second, and third year), we modelled LS trajectories over time. LS more than one year before entering VET constitutes the reference measurement. We estimated the difference in LS trajectories between migrants and stayers by interacting VET-related migration with the aforementioned year dummies.

$$LS_{it} = \beta_t T + \gamma_t T \times M_i + \alpha_i + \varepsilon_{it} \quad (1)$$

In equation (1), M_i denotes a person-level dummy variable for VET-related migration, T the dummies for each training year, LS_{it} the outcome variable for each person at each time point T , α_i the person-level fixed effect, and ε_{it} the residual. β_t denotes the time-fixed effect, while γ_t is the coefficient of interest for each time point.

Moreover, we modelled interactions between time points, VET-related migration, and the additional moderator variables (VET opportunity structure, occupational status, destination region) to estimate the LS trajectories of specific groups of apprentices:

$$LS_{it} = \beta_t T + \gamma_t T \times M_i + \delta_{1t} T \times X_i + \delta_{2t} T \times M_i \times X_i + \alpha_i + \varepsilon_{it} \quad (2)$$

In equation (2), X_i represents the person-level moderator variables (VET opportunity structure, VET status, type of destination region) and δ_{1t} and δ_{2t} represent the coefficients of the main effects and interaction effects with VET-related migration for each time point.

⁶Due to a large time gap between the collection of waves 10 and 11, we did not group them together. Because waves 12 to 14 roughly cover the period of the COVID-19 pandemic, we chose to not group wave 11 together with waves 12 to 14 to better control for the effect of the pandemic on LS.

We estimated all models using cluster-robust standard errors on the person level. We used R (version 4.5.3) and the packages *plm* (version 2.6-7) and *marginalEffects* (version 0.32.0) for the estimations.

Results

Effects of VET-Related Migration on the Life Satisfaction of Apprentices

Based on SPF theory and RCT, we hypothesised that VET-related migration had positive average effects on LS (H1). To test H1, we first turn to a description of the LS trajectories of migrants and stayers. Fig. 1 shows their mean LS trajectories (for details, see Table A2 in the online appendix). For both groups, it unveils a substantial increase in LS following VET entry of about 0.7 points on the LS scale, followed by a small decrease towards the end of VET.⁷ Moreover, apprentices who migrate begin at slightly lower LS levels on average but catch up during the VET phase. Considering their similar shapes and convergence over time, the curves suggest only small differences in the LS trajectories of migrants and stayers.

Using fixed-effects models, we observe neither statistically significant nor substantial differences in LS during the VET phase between migrants and stayers relative to their respective baseline levels (Fig. 2). Thus, internal migration does not seem to provide a general benefit in light of the substantial increase in LS associated with leaving school and entering VET. Therefore, we reject H1.

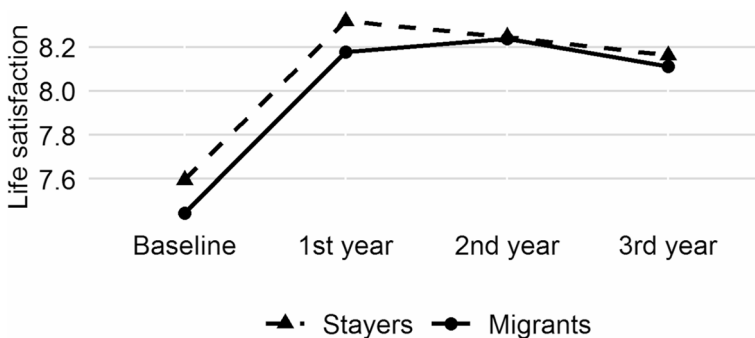


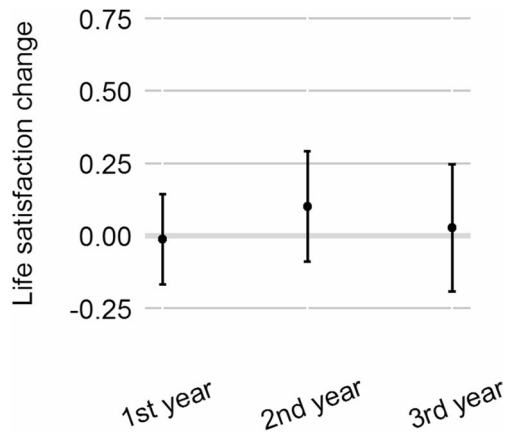
Fig. 1 Life satisfaction trajectories of stayers and migrants (means).

Note: The full regression models are available in Table A5 in the online appendix.

Data source: NEPS SC4, N (individuals, total) = 2,797, N (stayers) = 2,289, N (migrants) = 508

⁷ With about 0.4 scale points, the increase remains large for all apprentices in the first training year even when controlling for unobserved time-constant heterogeneity, age, and period effects (see model (1) in Table A5 in the online appendix).

Fig. 2 Effects of VET-related migration on apprentices' life satisfaction: Results of fixed-effects regressions (average marginal effects and 95% confidence intervals). Note: The full regression models are available in Table A5 in the online appendix. Data source: NEPS SC4, N (individuals) = 2,797, N (observations) = 17,788



The Moderating Role of Regional VET Opportunities, Status Attainment, and Destination Regions

Regional VET Opportunities

We hypothesised that the effects of VET-related migration on LS might be smaller for apprentices from regions with poor VET opportunity structures (H2). To test H2, Panel (a) in Fig. 3 shows the effects of a poor VET opportunity structure⁸ in the home region for internally migrating apprentices. It reveals that migrants from regions with poorer VET opportunities experience slightly, yet not statistically significantly greater LS gains than those from regions with better VET opportunities, thus contradicting H2.

Status Attainment

H3 stated that the effects of VET-related migration should be larger for apprentices attaining higher-status occupations. Indeed, the results in panel (b) of Fig. 3 indicate a small positive LS effect in the first training year of VET-related migration towards a VET position with a higher ISEI score.⁹ This first-year benefit (+0.18 points, SE=0.075, $p=0.016$), however, decreases and loses significance in the second and third training years.

Type of Destination Region

Based on the assumption that urban regions offer attractive amenities for young adults, we expected larger LS gains for apprentices migrating to urban regions (H4). Supporting this hypothesis, panel (c) in Fig. 3 shows a large initial LS premium for

⁸ The effect sizes refer to the difference between a mean VET opportunity structure and a VET opportunity structure one standard deviation below the mean.

⁹ The effect sizes refer to the difference between a mean ISEI score and an ISEI score one standard deviation above the mean.

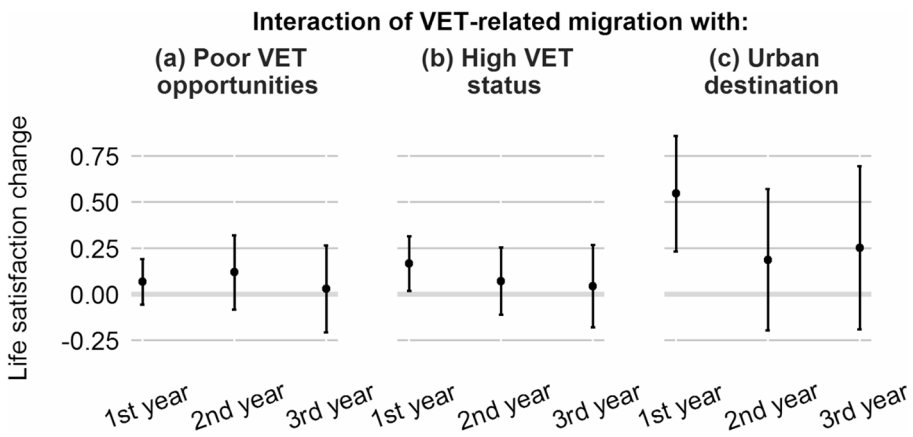


Fig. 3 Moderation of the effects of VET-related migration on apprentices' life satisfaction: Results of fixed-effects regressions (average marginal effects and 95% confidence intervals).

Note: The full regression models are available in Table A5 in the online appendix.

Data source: NEPS SC4, N (individuals) = 2,797, N (observations) = 17,788

this group (+0.56 points, $SE=0.160$, $p=0.001$). In the second and third training years, the effect decreases and becomes statistically insignificant but remains substantially positive. The large standard errors hint at heterogeneity in the sample not explained by our models. We conclude that moving to urban regions may be beneficial to some, but not all, apprentices – and mainly in the short term.

Sensitivity Analyses

To assess the sensitivity of our results, we carried out a comprehensive multiverse analysis and split-sample analyses. Multiverse analysis inspects how sensitive the results are to alternative modelling decisions (Steege et al., 2016). The alternative specifications relate to the selected sample, operationalisation of key variables, mobility distances, correction for potential selection effects using entropy balancing, and the handling of missing values. Section A2 of the online appendix summarises all results. Our results are sensitive to the model specification in mainly three ways: First, excluding migrants to adjacent RLMs, that is, keeping only longer-distance migrants, tends to result in slightly more positive effects of VET-related migration on LS. This suggests that longer-distance internal migration may be more beneficial than shorter-distance migration. Second, the moderation by the occupational status of the VET position is statistically significant only in models using complete cases. Still, the point estimates have the same direction in models using multiple imputations. This finding likely reflects inflated standard errors resulting from the multiple imputation procedure. Because the direction of the first-year effect is always positive, we maintain our conclusion that reaching a higher occupational status through migration slightly increases LS in the first year. Third, the operationalisation of destination regions matters. We find smaller coefficients if only large cities are coded as urban regions. This may indicate that migration to urbanised districts, not to the largest cities, drives the positive effects of migration to urban regions.

To test whether the positive effects of VET-related migration to urban destination regions merely reflect an improvement in occupational opportunities, we repeated our analyses using split samples for apprentices in rural and apprentices in urban regions (for details, see section A2.4 of the online appendix). The results hint at differences between occupational and personal motivations for VET-related migration. The first-year effect of occupational status on LS is only statistically significant in the group of apprentices migrating to rural regions, indicating that this group foregoes urban amenities in favour of attaining higher occupational status. Conversely, the effect of occupational status on LS is always statistically insignificant for apprentices migrating to urban regions. This indicates that apprentices who strive for a high occupational status are willing to forego urban amenities and that apprentices who value urban amenities are less sensitive to occupational status as a means of production of LS.

Discussion

Main Findings and Implications

Prior research on the effects of migration on life satisfaction (LS) has mostly used broad samples of the adult population, implying that its conclusions are not readily transferable to individuals in life stages such as childhood, youth, young adulthood, and old age. Moreover, it has not sufficiently considered potential life events preceding, accompanying, or following migration, implying that the extent to which migration affects LS beyond these events is not fully understood. To narrow this research gap, we examined the effects of internal migration on LS during the transition to vocational education and training (VET). Given that migration decisions at this transition are likely driven by regional opportunity structures and lifestyle preferences, we explored the potential moderating influences of pre-migration regional VET opportunities, the attained occupational status, and the type of destination region. We developed our hypotheses by applying theories of social production functions (SPF) and rational choice (RCT) to the specific case of VET-related migration. We tested our hypotheses using large-scale longitudinal data from the German NEPS and applying fixed-effects panel regression models.

Our results support the claim that research on the effects of migration on LS should consider the specificities of life course stages and coupled life events. They reveal that leaving school and entering VET is followed by a substantial increase in LS – a finding which aligns with previous research on German apprentices (Reuter et al., 2022; Siembab & Stawarz, 2019). Our multivariate models indicate an increase of about 0.4 points on the LS scale, which is comparable in size to union formation and childbirth (Krämer et al., 2025; Rußmann et al., 2025). In light of this major LS surge, we did not find a significant standalone effect of VET-related migration on LS. This does not align with H1 and various studies reporting significant positive average effects of migration on LS for the broader adult population (Erlinghagen et al., 2021; Kratz, 2020; Melzer & Muffels, 2017; Nowok et al., 2013). We conclude that it is the transition to VET itself that drives young adults' LS. For them, internal migra-

tion appears to be a means to achieve a successful transition from school to VET. In the broader adult population, on the other hand, migration may be more directly targeted at tangible gains, such as increased income or improved housing, which could explain why studies on this group find significantly positive effects.

Our study also highlights the importance of considering the circumstances of the transition from school to VET when analysing the effects of internal migration on LS. As expected, we found that VET-related and lifestyle factors moderate the effects of migration: Supporting H3, apprentices who migrated within Germany experienced a small additional gain in the first training year by entering higher-status occupations (+0.2 LS points for a one standard deviation higher ISEI score of the trained occupation). Furthermore, migration to urban as opposed to rural regions led to large improvements in LS in the first training year (+0.6 LS points), thus supporting H4. These LS improvements may be explained by the importance of urban amenities for young adults and their lifestyle aspirations (Busch, 2016; Otte & Baur, 2008; Schäfer & Just, 2018).

Contrary to H2, we did not find the effects of VET-related migration to be smaller for apprentices from regions with poor VET opportunity structures. Instead, we found these effects to be slightly, yet statistically not significantly larger. One explanation might be that leaving regions with poor VET opportunity structures may be experienced as overcoming a major disadvantage. The feeling of successfully overcoming this disadvantage may yield a benefit not experienced by apprentices from advantageous regions. It could thus be a unique benefit for individuals who left poor VET opportunity structures, which might balance the hypothesised negative effect.

As stated above, our study reveals that the moderated positive effects of VET-related migration on LS, which we observed for migration towards high-status positions and urban regions, are statistically significant only in the first year after entering VET. This finding fits the notion of the hedonic treadmill (Brickman & Campbell, 1971). According to the hedonic treadmill, individuals tend to raise their aspirations or shift their focus to new goals after attaining a desirable goal (e.g., attaining a high-status occupation or migrating towards urban amenities). The life course perspective additionally highlights that the transition to adulthood is usually accomplished during the VET life stage, which tends to transform individual objectives and aspirations (Benson & Furstenberg, 2006). Another possible explanation for the effects diminishing over time is the potentially limited ability of individuals to predict their future satisfaction with gains in specific life domains (Hendriks & Bartram, 2019; Murphy, 1992). This should be true especially for young adults, who are often confronted for the first time with far-reaching decisions, e.g., about entering a new educational stage or migrating. For example, relocating to urban regions may initially seem highly desirable to young adults, and even increase their expectations regarding quality of life (Hanell, 2022). Later, however, they may realise that their expectations may have been too high. Difficulty in fulfilling initial expectations may result from goal attainment requiring substantial resources in costly urban regions (Otte & Baur, 2008), which young adults usually do not have. It may also result from migrating apprentices initially overestimating their ability to socially integrate into their new social environment (Hendriks et al., 2016). Finally, LS tends to be influenced by reference group effects (Hirata & Groß, 2025). Immediately after migrating, apprentices may

still compare themselves to young adults from their home regions. Over time, however, they may increasingly compare themselves to young adults in their new occupations and destination regions, who may possess larger capabilities to achieve high LS. Gaps between expectations and lived experiences as well as changes in reference groups may explain the observed re-decline in LS after VET-related migration.

In summary, German apprentices experience a significant increase in LS upon entering VET. VET-related internal migration, however, does not generally impact LS at this transition. A reason could be the coupling of VET entry and the migration event. Arguably, successfully entering VET is the most relevant aspect for young individuals' LS at this point in life, apparently independently of potential migration. In this respect, first evidence suggests a similar pattern regarding the transition to higher education: The transition from school to higher education is followed by a similar LS increase as VET entry and internal migration during the transition to higher education does not yield a notable LS premium on average either (Warkotsch & Netz, under review). Thus, we conclude more generally that successful transitions into post-secondary pathways are most important for young adults' LS (cf. Dietrich et al., 2022; Reuter et al., 2022; Siembab & Stawarz, 2019), while internal migration rather functions as a means to facilitate such transitions.

Still, our findings indicate that VET-related migration can be a means for achieving higher LS under certain circumstances: Migration can lead to notable (yet mostly short-term) gains in LS when apprentices attain high-status occupations and especially when they move to urban areas.

Limitations

Our study has some limitations, which suggest ways forward for research on the effects of migration on LS. First, although we included several key variables influencing the migration decision in our entropy balancing models, the inclusion of additional variables, such as the family context, union formation and dissolution, and health, could further reduce remaining selection bias.

Second, our data do not permit us to neatly separate the effects of migrating from the effects of gaining independence from the parents through other means. A conceivable test would be to compare apprentices who stay within the parental household, apprentices who leave the parental household but stay within its proximity, and apprentices who migrate to a different region.

Finally, the large standard errors for the point estimates of the effects of urban destination regions suggest that some regional differences were not captured by our measures. In this respect, it would be beneficial to consider additional facets characterising destination regions, such as average rent levels, green spaces, as well as opportunities to take part in social and cultural life.

Further Research

Further research is needed to address the limitations of this study but also to learn more about how internal migration affects well-being during young adulthood. First, further research could examine differences in LS changes depending on the regions

of origin and destination in more detail, for instance, regarding the availability of specific amenities, housing costs, or occupational and socio-economic structures. It could also consider differences between countries regarding the features of national education systems and the possibility or necessity to migrate. Such analyses would show whether our theoretical claims are transferable to other institutional settings.

Second, our data do not allow us to comprehensively consider changes in LS during the time leading up to VET-related migration. From a theoretical point of view, it would be interesting to additionally examine pre-migration LS heterogeneities and anticipation effects of internal migration preceding the transition to VET. Similarly, future research could study possible anticipation effects of the transition into the labour market, which may take place at the end of the VET life stage. It is plausible that, depending on training success and regional opportunity structures, some apprentices may perceive the approaching completion of VET as positive – especially if they expect a smooth transition into the labour market – while others may anticipate difficulties. Furthermore, graduating from VET presents apprentices with several options: returning to their home region, remaining in their region of training, or migrating elsewhere (Bijwaard & Wahba, 2023). All these options entail further life events having the potential to influence LS trajectories.

Finally, further research could also examine whether the effects of VET-related migration on LS are moderated by personal characteristics, such as personality traits, prior educational attainment, and social origin. Such moderators might also help explain, for example, the large heterogeneity we find in the LS effects of moving to urban regions.

Conclusion

Our study highlights the need for life stage-specific theoretical and empirical modelling, thereby considering coupled life events (for a similar argumentation with regard to international migration, see Witte et al., 2023). As our study has illustrated, the coupling of migration with other life events can shape the effects of migration on LS. Consequently, future research on the effects of migration should acutely consider the timing in the life course when migration occurs and relevant factors moderating its effects.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s11482-026-10659-7>.

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Declarations

Ethics Approval The results presented in this article do not allow for deductive disclosure of the survey participants’ identities. Participation in the survey was voluntary and participants’ confidentiality was protected.

Conflict of Interest The authors declare that they have no conflicts of interest.

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