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Examining the Dynamic Interplay of Motivation and Friendships within a Collegiate Extracurricular Activity in the U.S.: The Case of Marching Band

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Abstract: Research links extracurricular activity (ECA) participation to developmental outcomes, yet little is known about social processes that occur within ECAs. We examine associations between motivation (intrinsic, extrinsic) and friendship processes (selection, influence) within a collegiate marching band in the US (n=193). Using social network analysis, we found evidence of selection, but not influence, on motivation. Selection findings differed by motivation type, such that extrinsic motivation was associated with increased friend nominations, whereas intrinsic motivation was associated with decreased nominations. Unexpected findings are explained by the context of this highly specialized ECA. Implications for supporting motivation in extended education settings are discussed.

Keywords: social network analysis, extracurricular activities, college students, friendships, motivation

Introduction

Friends are key socialization agents across the life span (Rubin et al., 2015), such that friends tend to be similar to one another on a wide range of attributes (Veenstra et al., 2013). Friend similarity is explained by two distinct processes: selection and influence. Selection is the process of choosing friends who share similar attributes, whereas influence is the process of becoming increasingly similar to friends on a given attribute (Brechwald & Prinstein, 2011). The peer relations literature is ripe with studies using social network analysis to distinguish selection and influence on a variety of attributes (Veenstra et al., 2013). However, the social network scholarship has predominantly focused on observable attributes (e. g., problem behaviors, Osgood et al., 2015). There is initial evidence of friend similarity on non-observable attributes, including motivation, that warrants attention (e. g., Wild & Enzle, 2002).

Friends are important for motivation, such that youth make decisions about how to spend their free time based on their friends (Arnett, 2000). Indeed, friends are a primary factor in choices about participating in extracurricular activities (ECAs) (Schaefer et al., 2011). In this study, we examine the associations between friendship processes and motivation to participate in a highly specialized ECA, namely marching band. Marching band requires technical skills and a substantial time commitment and, thus, youth must be motivated to participate (Cumberledge, 2017). We use social network analysis to test whether youth choose friends with similar motivation (selection) and whether youth socialize one another to become more similar over time (influence). We distinguish internally derived (intrinsic) and externally derived (extrinsic) motivation to participate in marching band because of their salience in ECAs (Wigfield et al., 2015). Based on initial social network research on motivation (e. g.,

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Wild & Enzle, 2002), we expect both friendship processes (i. e., selection and influence) to be present in the marching band. However, given the highly specialized nature of marching band, we expect friendship processes to be stronger for intrinsic than extrinsic motivation.

Collegiate Extracurricular Activities: The Case of Marching Band

In the Western world, traditional college students (ages 18–22) often postpone the responsibilities of adulthood, such as employment and marriage, and extend the self-exploration activities that are typical of adolescence (Arnett, 2000). During college, ECAs can provide important self-exploration experiences, which vary depending on the type of ECA (Vandell et al., 2015). ECAs are often categorized in social science research into one of five broad types (Larson et al., 2006): faith-based and service, academic and leadership, performance and fine arts, community organizations and vocational clubs, and sports. Marching band is a hybrid type of ECA that has characteristics common to performance and fine arts activities (e. g., music performance), as well as athletics (e. g., physical coordination, breath control, mental focus). Participation patterns in marching band follow the general ECA participation pattern of early sampling and later specialization, such that the highest attrition occurs during the transition from high school to college. One study found that nearly 75 % of high school band members did not participate in college (Mantie & Dorfman, 2014). Thus, motivation is a critical factor in retaining participation in marching band in college.

Participating in collegiate marching band involves both intrinsic and extrinsic factors. Intrinsic factors include interest and personal satisfaction. That is, students who participate in marching band in college are typically those who are interested in music, enjoy the band, and, as well, are willing to sacrifice the cost of participation in terms of their time and alternative opportunities (Mantie & Dorfman, 2014). There are also many personal benefits to participating in marching band, such as the opportunity to develop social skills, discipline, teamwork, and leadership (e. g., Garrison, 1986; Hash, 2021). The extrinsic factors involved in collegiate marching band are similar to those which characterize American sports. For example, the marching band performs at major athletics events (e. g., American football games), which offers prestige for the university (Allsup & Benedict, 2008) and entertainment for spectators (Cumberledge, 2017). Moreover, similar to sports, marching band emphasizes American cultural values of competitiveness and achievement (e. g., Allsup & Benedict, 2008), which are common extrinsic factors involved in ECA participation. Thus, decisions to continue participating in marching band in college are likely complex and involve both intrinsic and extrinsic factors.

Collegiate ECAs may also be specialized contexts for friendships, which likely matters for motivation. On the one hand, as an arts activity, marching band fosters creativity and self-expression, a common foundation from which friendships are formed and reinforced (e. g., Vandell et al., 2015). However, on the other hand, marching band is highly competitive, has a limited number of positions (e. g., section leaders, members), and is segmented by section (e. g., woodwinds, brass, etc.), each of which may inhibit friendship formation or maintenance (e. g., Patrick et al., 1999). Understanding the interrelation of motivation and friendships may inform retention in marching band as well as other highly specialized ECAs.

Sources of Friend Similarity: Disentangling Selection and Influence

There are two distinct processes through which youth and their friends may come to share similar qualities, namely selection and influence. Consider the fictious example of Kate, who is similar to two of her friends in the marching band, each explained by different processes. Kate meets Barry in the marching band and the two share stories about their favorite marching band performances. Kate and Barry become friends. Kate and Barry are similarly motivated because of a process of selection, such that they chose to be friends because of their shared interest in musical performance (i. e., selection on intrinsic motivation). Kate also meets Ana, who admits that she is tired of being in marching band. However, Ana's parents come to every performance, and she likes making them proud. Despite Ana's initial lack of internally derived interest in band, Ana and Kate become friends. Ana begins to admire Kate's passion for musical performance, which promotes her own interest in marching band. Thus, Ana and Kate are similarly motivated to participate in band because Kate socialized Ana (i. e., influence on intrinsic motivation). As this anecdote suggests, selection and influence are conceptually distinct processes that yield the same outcome (friend similarity).

Just as the concepts of selection and influence are distinct, there are also different theories that explain them. Friend selection may be explained by social identity theory (Tajfel & Turner, 1979), which suggests that individuals derive personal meaning from membership in social groups. ECAs are social groups that have been linked to distinct social identities (e. g., Eccles & Barber, 1999). Thus, many youth select friends from within their ECA either to reinforce shared interests or to avoid encounters with different others. Friend influence can be explained by social learning theory (Bandura, 1977), which suggests that individuals become similar by mimicking each other's behaviors. The concept of "contagion" is often tied to social learning, such that friends become similar to each other, for example, through social modeling or learning (Veenstra et al., 2013). There is potential for the presence of both selection and influence processes within marching band.

Selection and Influence on Motivation to Participate in Marching Band.

Intrinsic and extrinsic motivation are distinct and are promoted differently in practice. Self-determination theory (SDT) defines intrinsic motivation as any act that is done for (internal) enjoyment and extrinsic motivation as any act that is done for (external) recognition (Deci & Ryan, 2000). Intrinsic motivation is important for participating in ECAs because their voluntary nature means that youth can drop out of the activity whenever they lose interest (Wigfield et al., 2000). According to SDT, intrinsic motivation is promoted by fulfilling the three basic psychological needs of autonomy, competence, and relatedness. Two of the basic needs are defining features of marching band, such that participation is voluntary (and therefore autonomous) and skill-based (which requires competence). Friendship processes may be particularly relevant for the basic need of relatedness. That is, friendships promote a sense of belonging in ECAs which helps participants relate with the activity and with one another (e. g., Patrick et al., 1999). Friendships may be more important for intrinsic than extrinsic motivation to the extent that participation satisfies the basic need of relatedness.

Although there are few social network studies on motivation, two exceptions suggest the potential for links between friendships and motivation. First, in a study of Belgian secondary

school students, there was evidence of an association between both friendship processes (i. e., selection and influence) and both types of motivation (i. e., intrinsic and extrinsic) (Duriez et al., 2013): adolescents nominated friends with similar goal pursuits (selection on intrinsic and extrinsic motivation) and also became more similar to their friends (influence on intrinsic and extrinsic motivation). Second, in a study of intermediate school students in the U.S., there was evidence of an association between both friendship processes (i. e., selection and influence) and intrinsic, but not extrinsic, motivation (Shin & Ryan, 2014). That is, adolescents nominated friends with similar mastery goals (selection on intrinsic motivation) and, as well, became more similar to their friends in terms of their mastery goals (influence on intrinsic motivation). Friendships were not associated with performance goals, suggesting that there was no evidence of selection or influence on extrinsic motivation (Shin & Ryan, 2014). These empirical findings provide initial evidence that friendships may be more strongly linked with intrinsic than extrinsic motivation.

The Present Study

We examine the association between friendship processes and motivation to participate in a collegiate marching band. We use stochastic actor-oriented modeling (SAOM) to disentangle two friendship processes, namely selection versus influence, and to address the limitations of traditional individual-level inferential statistics (Veenstra et al., 2013). SAOM also accounts for confounding processes, such as selection on socio-demographic characteristics (e. g., gender, race/ethnicity) and network structural effects known to explain the evolution of the network (Snijders et al, 2010). SAOM yields two sets of parameters which provide estimates of selection and influence, each statistically controlling for the other. We test whether motivation is associated with changes in friendships (friend selection) and whether friends' motivation is associated with changes in individual's motivation (friend influence). Based on theory and empirical research, we expect that both friendship processes (i. e., selection and influence) will be present, but stronger for intrinsic than extrinsic motivation.

Method

All members of a collegiate marching band from a large public university in the Southwestern U.S. were invited to participate. The full band had 306 members, of which 72 % (n=202) consented and 193 students participated. The sample (53 % female) ranged in age from 18 to 30 years (M = 19.44 years, SD = 1.51) and had completed one to six band seasons (M =2.17, SD = 1.19). The sample was majority White, but had diverse representation (63.7 % White/European American, 19.7 % Hispanic/Latinx, 5.2 % Black/African American, 5.2 % Asian American, 3.6 % Native American, 2.1 % other).

The sample represents one of the top collegiate marching bands in the U.S., which has been recognized with several awards and honors. The size of this marching band is typical for a Division I university and follows the organizational structure and schedule typical of collegiate marching bands in the U.S. Band members participated in 8–12 hours of rehearsal and

6–10 hours of performance per week, which provided time for extensive interactions among band members.

Procedures

The data were collected in September and November 2013, which corresponds to roughly weeks 6 (Time 1, just after convening for band camp) and 16 (Time 2, the end of marching season) in the band season. At each time point, participants completed electronic surveys that included motivation measures and then one week later social network data were collected in person. All procedures were approved by the university's Office of Research Integrity and Assurance.

Measures

In the online survey at Time 1, participants reported their age, gender, race or ethnicity, and prior experience in collegiate marching band (number of band seasons). The marching band's management provided information on band section membership and leadership.

Friendships

Friendship data were collected using standard social network protocols. Participants were provided with an alphabetized list containing names and ID codes of all band members who agreed to participate in the study. Participants were asked to use the list to nominate individuals "considered your closest friends with whom you spend a lot of time doing different activities and whom you can count on when you need help." Participants were allowed to nominate an unlimited number of friends (max reported = 19). The friendship nominations a participant received (incoming ties) and the friendship nominations they made (outgoing ties) are two separate measures of the network.

Motivation

Participants completed the Sports Motivation Scale (SMS; Pelletier et al., 1995), adapted for marching band (response options: 1 = *does not correspond at all*, 7 = *corresponds exactly*; see Online Supplementary Materials for the full measure). Scores across items were averaged to create two subscales: intrinsic motivation (12 items; $\alpha = .858$ at Time 1, $\alpha = .863$ at Time 2; e. g., "For the intense emotions I feel doing an activity I like." "For the pleasure of discovering new performance strategies.") and extrinsic motivation (12 items[1]; $\alpha = .812$ at Time 1, $\alpha = .814$ at Time 2; e. g., "To show others how good I am at performing." "Because, in my opinion, it is one of the best ways to meet people.").

1 Two items in the extrinsic motivation scale ("Because, in my opinion, it is one of the best ways to meet people" and "Because it is one of the best ways to maintain good relationships with my friends") directly reference making social connections as a motivation for participating in marching band. A sensitivity analysis was performed and removing these two items from the scale produced identical results, suggesting that these two items did not have an undue influence on results. As such, the items were retained in the scale.

Analysis Plan

Stochastic actor-oriented modeling (SAOM) was used (Snijders et al., 2010) to estimate peer selection and influence effects using RSiena 4.0 (version 1.2–12; Ripley et al., 2021) in R version 3.4.2 (R-Project; http://www.r-project.org). This modeling approach makes several assumptions, all of which were met in this network. The SAOM consists of two functions that are estimated simultaneously: the *network function*, which tests the likelihood of friendship ties between marching band members (selection), and the *behavior function* which tests effects related to changes in motivation over time (influence). SAOM uses the network and motivation scores which were observed at Time 1 to estimate the effects hypothesized to be responsible for the changes in the network and motivation at Time 2. Model estimation uses a method of moments procedure to estimate parameters based on probabilities of model-implied networks to reproduce the observed data (for details, see Snijders et al., 2010). Model parameters are tested for significance based on a *t*-ratio.

Network Function: Testing for Friend Selection on Motivation

The network function included effects for selection, among others. The model uses a network function to predict whether existing ties are likely to persist from Time 1 to Time 2. The function includes three types of effects that predict the likelihood of a friendship tie as a function of an individual attribute: 1. the primary effect of interest to test for selection was the *similarity* effect, which assessed the tendency to nominate friends who had similar scores on motivation; 2. *alter effects* assessed the tendency to receive friend nominations; and 3. *ego effects* assessed the tendency to nominate friends. Ego, alter, and similarity effects were included for intrinsic and extrinsic motivation, for a total of six effects.

Next, we included several other *similarity effects* to control for confounding network selection processes, such as the tendency to nominate friends who are similar on other attributes (i. e., gender, race, band section, marching band tenure). Several parameters were also included to control for endogenous network structural processes: *outdegree* (total number of friendships in the network) and *network rate* (network change opportunities), which are necessary to include in any SAOM model; *reciprocity* (tendencies to nominate friends who also nominated them as a friend), which is a dyadic effect; *transitive triplets* and *transitive ties* (tendency to be friends with friends of friends), *transitive reciprocated triplets* (tendency to reciprocate nominations with friends of friends), *3-cycles* (tendency for hierarchical structures in friendships), and *number of actors at distance 2* (tendency to be connected indirectly through a friend), which are triadic effects; and two degree-related effects, namely *indegree popularity* (tendency for individuals receiving several nominations to receive increased nominations), as well as *outdegree popularity* and *outdegree activity* (tendency for individuals nominating several friends to nominate more friends).

Behavior Function: Testing for Friend Influence on Motivation

The behavior function included effects for friend influence and estimated whether an individual's motivation at Time 2 was predicted by their friends' motivation at Time 1. The primary parameter of interest was the *average alter effect*, which assessed the tendency for individuals whose friends had a higher average value to also have higher values on the

attribute (Ripley et al., 2021). An average alter effect was included for intrinsic and extrinsic motivation.

Results

Table 1 provides descriptive information for the network and motivation variables. The network had characteristics similar to those reported in other research on human social networks (Veenstra et al., 2013). That is, density was consistent with rates reported on similar friendship networks (i. e., .03) and there was reasonable stability in friendships in the network, as indicated by the Jaccard index (i. e., .32).

The SAOM model fit the data well, as suggested by suitable convergence ratios for the overall model (i. e., 0.21) and for all parameters (i. e., all < .08). Goodness-of-fit for key network and motivation parameters was suitable for all estimates, with one exception (i. e., indegree). We explain our findings by first presenting the set of parameters which provides estimates of friend selection (termed the network function), and then the set of parameters which provides estimates of peer influence (termed the behavior function).

Friend Selection on Motivation to Participate in Marching Band

Contrary to expectations, the nonsignificant parameters for similarity on intrinsic and extrinsic motivation (the primary parameter estimates of interest) suggest that individual tendencies to select friends with similar levels of motivation was statistically non-significant (see Table 2). Two additional types of effects were included in the model, namely ego and alter effects. The ego effects, which estimate tendencies to nominate friends, were statistically non-significant, meaning that motivation had no effect on an individual's patterns of friend nominations. Both alter effects, which estimate tendencies to be nominated as friends, were statistically significant, but in opposite directions: extrinsic motivation was associated with receiving more friendship nominations, whereas intrinsic motivation was associated with receiving fewer friendship nominations.

Controlling for Confounding Network Selection Processes

Because multiple network selection processes give rise to friendship networks (Snijders et al., 2010), we included several parameters in our model that allowed us to account for these confounding network selection processes. Homophily (or similarity) effects on other characteristics were included to control for confounding network selection processes. Each of these effects were statistically significant, with one exception (see Table 2). That is, friends were more likely to be selected among those who were in the same band sections, had similar tenure, and were of the same race. The only homophily effect that was statistically non-significant was gender.

Among the effects included to control for endogenous network processes (see Table 2), several coefficients were statistically significant and all were in the expected directions. First, the significant outdegree parameter suggests that those who nominated more friends were not

inclined to also receive a lot of friend nominations. Next, several effects explained the likelihood that a friendship existed, such that there was a high likelihood of friends to nominate each other (reciprocity), to have an intermediary friend (transitive ties), to become friends with friends of friends (transitive triplets), and to share several friends (actors at distance 2). Finally, there was evidence that popular individuals had a tendency to receive friendship nominations (indegree popularity).

Friend Influence on Motivation to Participate in Marching Band

The parameter estimates of friend influence based on motivation are shown in Table 2. The average alter effects, which test for friend influence on intrinsic and extrinsic motivation (the primary parameter estimates of interest), were each statistically non-significant. Therefore, there was not evidence of friend influence on intrinsic or extrinsic motivation, meaning that student's motivation to participate in the marching band did not change over time as a function of their friends' motivation.

Discussion

The present study is the first, to our knowledge, to examine links between motivation and friendship processes within a highly specialized ECA (i. e., marching band). Based on theory and empirical research, we hypothesized that both friendship processes (i. e., selection and influence) would be present in the marching band, but would be stronger for intrinsic than extrinsic motivation. Our findings partially supported our expectations. Contrary to expectations, there was no evidence of friend influence on either type of motivation. There was evidence, however, of friend selection on both types of motivation. Interestingly, the directions of the selection effects were contrary to expectations. Taken together, these findings have implications for our understanding of psychosocial processes in extended education settings. These results also generate practical insights about friendships as intervention points to promote retention in extended education programs, such as ECAs (Vandell et al., 2015).

Motivation Matters for Desirability as Friends

In this section, we consider the two findings pertaining to friend selection, beginning with extrinsic motivation and then turning to intrinsic motivation. First, there was a significant association between friend selection and extrinsic motivation, such that increases in extrinsic motivation were associated with receiving *more* friend nominations. In the U.S., collegiate marching bands are highly competitive and have high performance expectations. Highly competitive activities often implore participants to tout their performance-related achievements and focus narrowly on winning or being recognized as the best (Ettekal et al., 2016). Extrinsically motivated individuals thrive on opportunities for recognition. A plausible explanation for our finding is that extrinsically motivated youth who seek attention may be perceived as the best members of the band and, thus, desirable as a friend. Another ex-

planation is that some individuals may participate in ECAs to make and retain friends (e. g., Persson et al., 2007). Thus, friendships may be rewards or recognition in and of themselves. An interesting question for future research is to disentangle the role of friendships for extrinsic motivation within extended education settings that vary in their competitive versus cooperative nature to better characterize these dynamics.

Next, there was a significant association between friend selection and intrinsic motivation, such that increases in intrinsic motivation were associated with receiving *fewer* friend nominations. We theorized, based on SDT (Deci & Ryan, 2000), that friendships might fulfill an individual's need for relatedness and, thus, may be essential for intrinsic motivation. However, our findings indicated that intrinsic motivation did not promote friendship selection over time. One possible explanation for our finding is that friendships within the marching band did not fulfill the need for relatedness. Intrinsically motivated individuals may fulfill their need for relatedness through other means, such as through the teamwork required to perform (with friends and non-friends alike). Another explanation might be that other psychological needs are more salient for intrinsic motivation than relatedness. SDT suggests that three basic psychological needs of autonomy, competence, and relatedness each promote intrinsic motivation. However, SDT does not suggest which factors are more important than others and in which contexts. Collegiate marching bands in the U.S. involve specialized skills and, thus, competence may be a driving factor for intrinsic motivation (Fraser-Thomas et al., 2005). Future research should explore how the link between motivation and friendships varies across extended education settings.

Taken together, the developmental patterns of friendships and motivation might suggest that friendships are intrinsically motivating in earlier developmental periods, such as during secondary school, and extrinsically motivating during later periods, such as during higher education. Research on motivation suggests that intrinsic motivation declines, whereas extrinsic motivation increases across the life span (Wigfield et al., 2015), offering another possibility for why extrinsically motivated individuals were more desirable as friends for college students. Future studies should consider variations across developmental periods in the links between the motivation types and friendships to further understand the nature of these processes.

The social network effects generated a portrait of the friendship network in a collegiate marching band. Our results indicated that band members tended to select friends within their band section and those with a similar tenure in the marching band, which may be unsurprising. According to focus theory (Feld, 1981), social connections and close relational ties are likely among individuals who participate in joint activities through sheer opportunity to spend time together in the same context. In marching band, the opportunities to practice and perform together may be constrained to the section, limiting opportunities to interact across section. Thus, the typical sorting mechanisms of a social network (e. g., based on gender; Veenstra et al., 2013) are interrupted. More research is needed to understand whether and how friendship sorting mechanisms generalize across contexts and developmental periods.

Friend Influence: Unexpected Null Findings

We did not find evidence of peer influence on motivation, which conflicts with the plethora of research that finds influence on a variety of behaviors (e. g., Sijtsema & Lindenberg, 2018).

However, an important distinction of previous literature is the nearly exclusive focus on *observable* behaviors. Motivation is a dynamic characteristic that describes a person's tendency to act based on interest/value (intrinsic motivation) versus rewards/recognition (extrinsic motivation). The indicators of motivation are likely to be less observable compared to behavioral attributes (i. e., smoking, substance use). Influence on observable behaviors is often theorized to occur based on tenets of social learning theory (Bandura, 1977), in which social learning occurs through a process of observing and replicating others. More research is needed on less observable attributes, such as motivation, to understand what individuals perceive as indicators of motivation.

Nevertheless, there is at least one study that found peer influence on motivation-related attributes in adolescence. Shin and Ryan (2014) found peer influence on adolescents' mastery (intrinsically derived), but not performance (extrinsically derived) academic orientations. More research is needed to discern whether our results are a developmental finding, such that peer influence on motivation is less salient during college than during high school. Developmentally, there is adequate reason to suggest that influence processes may vary across periods. College students have increased executive function relative to adolescents, which has been linked to enhanced social-emotional competence (Riggs et al., 2006). Thus, college students likely make more accurate associations between observed behaviors and psychological attributes than their younger peers. It is unclear whether peer influence on psychological attributes indeed diminishes with age or whether individual's perceptions of others' psychological attributes qualitatively differ across the life span.

There is some evidence that friendship processes vary across developmental periods. Although friendships remain salient for college students, developing romantic relationships takes priority (Arnett, 2000). Thus, college students may fulfill their psychological need for relatedness in romantic, rather than friendship, relationships. Moreover, the transition to college is marked by a developmental need for intimacy, which is likely fulfilled by few close relationships rather than several superficial relationships. In short, our results are consistent with the notion that college students likely fulfill their relatedness needs across many different types of relationships and within smaller networks than adolescents.

Implications for Extended Education Settings

Given the specificity of the marching band context and relatively small empirical base from which to interpret our current findings, we hesitate to offer definitive implications for practice. Further research is needed, especially for null findings, to determine whether our findings represent potential developmental differences or a contextual nuance. Nonetheless, there are a few lessons for practice in extended education which our findings might inform.

There is myriad evidence that fostering intrinsic motivation should be priority for practice in extended education. Intrinsic motivation is related to increased engagement, retention, and better long-term outcomes than extrinsic motivation (Deci & Ryan, 2000). The members of the collegiate marching band in this study had higher intrinsic than extrinsic motivation, though both declined across the season. Thus, one implication for practice is that intentional efforts may be needed later in the season to bolster and sustain intrinsic motivation. The end of a season also presents more opportunity to satisfy extrinsic motivation tendencies, given that end-of-season banquets tend to celebrate recognition and performance more than intrinsically

derived aspects of the activity (e. g., self-improvement). Researchers should work closely with practitioners to better understand the waxing and waning of motivation across the season to help inform time increments within and across seasons for developmental studies (e. g., Ettekal et al., 2017).

We found unexpected links between friendships and motivation, such that extrinsically motivated band members were more desired as friends than their intrinsically motivated peers. This finding was contrary to our expectations because, theoretically, relatedness, a need which can be met through friendships, fosters intrinsic motivation (Deci & Ryan, 2000). This finding is concerning in light of the research on peer motivational climates. For example, whether the peer climate is ego- (i. e., extrinsically) or task- (i. e., intrinsically) oriented matters for the goal orientations of members within the team. An ego-oriented team environment makes ego-oriented athletes (Ettekal et al., 2016), which could happen in the context of this collegiate marching band. If extrinsically motivated members have increased social status, there is great potential for them to drive the peer climate, and, thus, to increase members' extrinsic motivation and hinder intrinsic motivation across the entire marching band. Interventions might focus more on social norms or motivational climates, rather than on the individuals within the group. Team-level interventions to develop caring peer climates have become a focus of intervention in sport (Fry & Gano-Overway, 2010) and, as we have described in this study, collegiate marching bands have many similarities with sport.

Finally, whether these findings generalize to international settings outside of the U.S. is an empirical question. Nevertheless, lessons gleaned from the present study could be applied in the global extended education community, bearing in mind the similarities and differences in context. For example, although marching band may be a highly a specialized ECA with particular characteristics in the U.S., other ECAs may have similar characteristics in international settings. As noted earlier, marching band is a hybrid ECA involving performance and fine arts, as well as sport. ECAs which combine art and sport, such as dance, may yield similar settings in which the friendship processes found in the present study might apply. Of course, the similarity between marching band and other related international ECAs depends necessarily on the context of reception. Marching band is also unique because of the prestige it brings to colleges and universities, which does not extend to band members. International ECAs that involve spectators, performance, and entertainment, and which yield different social standards for performers versus spectators, such as sport, may resemble the present context. In sum, findings from the present study should apply to global extended education to the extent that contextual differences and similarities are considered.

Limitations and Future Directions

A strength of this study was the use of an advanced SNA approach to estimate friend selection and influence processes while controlling for endogenous network processes. As an example, the findings from the present study contradicted findings from a study using the same data set, which used individual-level statistical modeling and found that intrinsic motivation was positively associated with a number of social connections (Weren et al., 2016). Here, we used SNA and found that, when the changing nature of the friendship network across the two time points was taken into account, intrinsic motivation was associated with receiving *fewer* social ties over time. Thus, consideration of social network dynamics and the changes that occur

within networks over time is essential to determine whether and how friendships and motivation are interrelated.

The longitudinal panel data used in the present study assessed friendships and motivation at two points in time across ten weeks. Developmental research has been critiqued for measuring networks over very long periods (i. e., yearly or every 6 months) and possibly missing important changes in relationships (Neal, 2020). This shorter time period allowed us to examine changes in friendships on a shorter time-scale, which was tailored to the relevant time points for this social group: one month after the band began rehearsing and two weeks before the end of the season.

Despite the noted strengths, this study has several limitations that represent opportunities for future research. Two limitations have to do with the measure of friendships. First, our friendship indicators provided no information about the quality of relationships. Extrinsically motivated individuals may have several friends, but may not necessarily feel a sense of relatedness in the activity because the relationships are distant. Conversely, an individual with one close friend may feel a sense of relatedness in the activity because the relationship is very close. Future research should account for various aspects of friendships (e. g., quality versus quantity) because they may help elucidate *how* friendships matter for relatedness in extended education settings. Second, we did not measure friendships outside of marching band. Although this limits the conclusions we can make about motivation and friendships in a broad sense, our conclusions provide insight into these processes within a specific context.

Another set of limitations concerns the nature and context of the network data. As in any longitudinal research, incomplete network data is a limitation because, although minimal, there was some attrition. We used the standard SAOM missing data imputation procedure to minimize bias in parameter estimates (Snijders et al., 2010). Nevertheless, our results should be interpreted with some caution, as we did not have information on non-participants. It is also important to acknowledge that these data were collected in 2013, which represents a specific moment in history. Although, there is no reason to believe there are substantial historical changes that would affect interpretation of these findings at the present time, replication studies will be useful to test for potential cohort effects.

Conclusion

Findings from this study underscore that extrinsic motivation could be beneficial for establishing new friendships in extended education, including ECAs. Especially in competitive ECAs, individuals who tout their accomplishments (e. g., extrinsically motivated individuals) may be desired social partners. Adult leaders of ECAs know well that helping participants develop a sense of belonging and relatedness is essential to retain participants and to encourage a high level of engagement (Vandell et al., 2015). However, practitioners need more research that informs *how* to promote relatedness. If friendships are more closely linked with extrinsic than intrinsic motivation, then friendships may be a necessary, but not sufficient, way to promote relatedness. Adult leaders should include other practices known to promote intrinsic motivation. If socialization (i. e., friend influence) on motivation is unlikely to occur (as suggested by our findings), then leaders would be foolish to wait around on friendships to "do their magic" in the activity. Understanding how friendships and motivation are interre-

lated is important to advance research in extended education and to inform positive practices within these settings.

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Table 1. Descriptive Statistics for Intrinsic Motivation, Extrinsic Motivation, and the Friendship Network

	Time 1	**Time 2**
Intrinsic motivation		
Continuous *M* [1] (*SD*)	4.99 (1.17)	4.55 (1.22)
Missing	6.2%	20.2%
Extrinsic motivation		
Continuous *M* [1] (*SD*)	4.24 (1.14)	3.99 (1.09)
Missing	6.2%	20.2%
Friendship network		
Density	0.032	0.030
Outdegree *M* (*SD*) range	6.24 (4.91) 0 – 19	5.79 (4.72) 0 – 21
Indegree *M* (*SD*) range	6.24 (5.15) 0 – 33	5.79 (4.60) 0 – 27
Number of ties	1204	1117
Jaccard index	0.321	

[1]Note: Continuous *M* is the mean of the continuous intrinsic and extrinsic motivation variables, rather than the mean of the rounded variables used in the SAOM.

Table 2. Stochastic-Actor Oriented Model (SAOM) Results for Associations between Motivation and Friendship Network

	Estimate	St. Error
Network Submodel		
Friend selection on intrinsic motivation		
Activity (Ego)	-0.08	(0.05)
Popularity (Alter)	-0.10*	(0.05)
Similarity	0.22	(0.36)
Friend selection on extrinsic motivation		
Activity (Ego)	-0.02	(0.05)
Popularity (Alter)	0.13*	(0.06)
Similarity	-0.05	(0.40)
Controls for Confounding Friend Network Processes		
Friend selection on individual attributes		
Same gender	-0.06	(0.07)
Same race	0.17*	(0.07)
Same band section	0.62*	(0.08)
Same number of seasons participated in band	0.19*	(0.07)
Network structural effects		
Rate parameter	11.73*	(0.76)
Outdegree	-2.79*	(0.22)
Reciprocity	1.95*	(0.17)
Transitive triplets	0.17*	(0.04)
Transitive reciprocated triplets	-0.20*	(0.07)
3-Cycles	0.01	(0.08)
Transitive ties	0.47*	(0.12)
Number of actors at distance 2	-0.10*	(0.04)
Indegree-popularity (sqrt.)	0.28*	(0.07)
Outdegree-popularity (sqrt.)	-0.28	(0.18)
Outdegree-activity (sqrt.)	0.009	(0.04)
Behavior Submodel		
Peer influence effects on motivation		
Average alter effect on intrinsic motivation	0.13	(0.32)
Average alter effect on extrinsic motivation	-0.02	(0.36)

* $p < .05$

Online Supplemental Materials

Marching Band Motivation Scale adapted to marching band context

Pelletier, L. G., Fortier, M. S., Vallerand, R. J., Tuson, K. M., Brière, N. M., & Blais, M. R. (1995). Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The Sport Motivation Scale (SMS). *Journal of Sport & Exercise Psychology,* 17, 35–53.

Instructions: Why do you participate in your marching band? Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport.
Response scale: 1=Does not correspond at all, 4=corresponds moderately, 7=corresponds exactly

1. For the pleasure I feel in living exciting experiences.
2. For the pleasure it gives me to know more about marching band.
3. I used to have good reasons for doing marching band, but now I am asking myself if I should continue doing it.
4. For the pleasure of discovering new performance techniques.
5. I don't know anymore; I have the impression of being incapable of succeeding in marching band.
6. Because it allows me to be well regarded by people that I know.
7. Because, in my opinion, it is one of the best ways to meet people.
8. Because I feel a lot of personal satisfaction while mastering certain difficult performance techniques.
9. Because it is absolutely necessary to do marching band for ones well-being.
10. For the prestige of being a performer.
11. Because it is one of the best ways I have chosen to develop other aspects of myself.
12. For the pleasure I feel while improving some of my weak points.
13. For the excitement I feel when I am really involved in the activity.
14. Because I must do marching band to feel good myself.
15. For the satisfaction I experience while I am perfecting my abilities.
16. Because people around me think marching band is important to ones well-being.
17. Because it is a good way to learn lots of things which could be useful to me in other areas of my life.
18. For the intense emotions I feel doing an activity that I like.
19. It is not clear to me anymore; I don't really think my place is marching band.
20. For the pleasure that I feel while executing certain difficult movements.
21. Because I would feel bad if I was not taking time to do it.
22. To show others how good I am good at performing.
23. For the pleasure that I feel while learning performance techniques that I have never tried before.
24. Because it is one of the best ways to maintain good relationships with my friends.
25. Because I like the feeling of being totally immersed in the activity.
26. Because I must perform regularly.
27. For the pleasure of discovering new performance strategies.
28. I often ask myself; I can't seem to achieve the goals that I set for myself.

Intrinsic motivation subscale items are 1, 2, 4, 8,12, 13, 15, 18, 20, 23, 25, 27
Extrinsic motivation subscale items are 6, 7, 9, 10,11, 14, 16, 17, 24, 21, 22, 26
Amotivation subscale items are 3, 5, 19, 28 (not used in analyses)