

THESIS SYNOPSIS

Eszter Vit

Peer Effects on Educational Aspirations

Doctoral Dissertation

Supervisors:

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Senior Research Fellow and Professor

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Department of Sociology

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1. Aim and Background of the Dissertation

1.1. Introduction

The thesis focuses on friends' role in the development of students' academic and educational aspirations. Adolescents are more sensitive to the opinions and influences of others, especially their peers, and are more likely than other age groups to conform to peer norms. Adolescents are also vulnerable to peer influences as they seek to develop an identity and peer relationships provide opportunities to experiment with this process. Furthermore, the structural transformation of education and timetables provides young people with more free time without adult supervision and greater autonomy, which also provides opportunities for peer influence (Laursen and Veenstra, 2021).

Empirical evidence has provided support for the contagion of behaviour among adolescents' peers. This effect has been observed for a wide range of behaviours, including antisocial and deviant behaviours as well as health-risk behaviours. There is also substantial evidence for peer influence on adolescent prosocial behaviours, such as academic motivation and adjustment (Brechwald and Prinstein, 2011, for review). Friendships formed in educational settings have a significant impact on adolescents' perceptions of themselves and their abilities in relation to others (Brooks, 2005). As a result, these friendships may have an impact on adolescents' educational goals, preferences and choices.

Several aspects of Hungarian adolescents' social networks have been examined extensively in recent years, for instance, the simultaneous evolution of many different relations (e.g., Boda, Néray and Snijders, 2020; Kisfalusi, Pál and Boda, 2020; Vörös, Block and Boda, 2019) and the co-evolution of network ties and individual attributes or behaviours (e.g., Boda, 2018; Grow, Takács and Pál, 2016; Kisfalusi, Janky and Takács, 2019). Among the latter, only little attention has been paid to peers' influence on Hungarian students' educational outcomes (e.g., Keller and Takács, 2019; Keller, Takács and Elwert, 2021).

This study aims to fill this gap and investigates how peers, and mainly friends may affect various aspects of students' educational aspirations in Hungarian primary schools: academic ambitions in two school subjects, and secondary school track preferences. The empirical chapters in the thesis distinguish mechanisms of how friends can influence students' aspirations such as adjusting to the norms, values, and attitudes shared by friends (e.g., Brown and Larson, 2009), accessing resources through one's social network that wouldn't be available otherwise (Coleman, 1988; Granovetter, 1973, 1983; Lin, 2001), and evaluating one's abilities and prospects through social comparison (Brooks, 2005; Erwin, 1998). The dissertation also considers the contribution of friendship selection to friends' similar aspirations. Moreover, one of the empirical studies accounts for the role of the broader peer context besides friends' effect on aspirations.

In Hungary, secondary schools are largely stratified based on socioeconomic background and academic achievement. Following, educational aspirations, choices, and opportunities after the transition to secondary education are drastically impacted by the secondary school track itself. Consequently, peers' influence on aspirations before tracking can be meaningful and have profound implications for students' academic trajectories.

1.2. Literature Review and Previous Research Findings

1.2.1. The formation of educational aspirations

Aspirations encompass a range of concepts including desires, preferences, choices, and calculations (Appadurai, 2004). Aspirations can play an important role in students' educational careers. Aspirations can increase students' motivation and thus, their educational achievement (Abu-Hilal, 2000; Trebbels, 2015). Furthermore, these two concepts can be mutually reinforcing (Gutman and Akerman, 2008; Zhang et al., 2011). Educational aspirations may be interpreted either as goals for the foreseeable future (Quaglia and Cobb, 1996) or, more particularly, as the minimal outcome an individual finds satisfactory (Castellani, Di Giovinazzo and Novarese, 2010). This dissertation explores both ends of this spectrum through empirical studies.

The first empirical chapter (Chapter 5 of the dissertation) examines the academic ambitions of students in two school subjects through their aspired grades. The second empirical chapter (Chapter 6 of the dissertation) examines the formation of preferences for secondary school tracks prior to the submission of secondary school applications. Finally, the third empirical chapter (Chapter 7 of the dissertation) looks at the most preferred option in students' secondary school applications.

Educational aspirations cannot be attributed solely to personal factors but are also influenced by people's social context (Appadurai, 2004; Gale and Parker, 2015; Gutman and Akerman, 2008; Tarabini and Curran, 2018). This dissertation therefore examines the influence of peers, and more specifically friends, on students' educational aspirations.

1.2.2. Peers and students' educational aspirations

During adolescence, children are more susceptible to the opinions and judgments of their peers compared to earlier stages of life (Laursen and Veenstra, 2021; Lieberman, 2015), particularly the influence of their friends (Berndt, 1992; Berndt and Savin-Williams, 1993; Brown and Larson, 2009). Friends can influence how individuals perceive academic challenges and their ability to cope with them (Taylor, 2004; Wigfield, Tonks and Klauda, 2009) or how students value academic success and specific academic outcomes (Archer, Hollingworth and Mendick, 2010; Gale and Parker, 2015; Wigfield, Tonks and Klauda, 2009).

1.2.2.1. The adjustment to peers' aspirations

Individuals, especially adolescents, often assimilate their attitudes and behaviours to those shared by relevant others (Brown and Larson, 2009). Assimilation to shared norms can occur through peer pressure, the reinforcement of conforming behaviour, or role modeling (Brown et al., 2008; Brown and Larson, 2009; Ryan, 2001). Peers can also create circumstances in which some behaviours are facilitated without explicit attempts (Brown et al., 2008).

In the school context, friends may directly shape adolescents' academic motivation (Altermatt and Pomerantz, 2003; Molloy, Gest, and Rulison, 2011; Ryan, 2001). In addition, friends can influence each other's academic values, norms, or effort (Eccles 2009; Hamm et al., 2011; Reindl, 2020; Shin and Ryan, 2014; Wigfield and Eccles 2020), as well as general attitudes towards school and the adoption of school-related norms that support or oppose educational success and school-conforming behaviour (Coleman, 1988; Crosnoe, Cavanagh and Elder, 2003; Kruse and Kroneberg, 2020; Ryan, 2001), beliefs, and prosocial behaviour (Wentzel, Barry and Caldwell, 2004).

Peers can also increase the visibility of certain educational options (Brown and Larson, 2009), for example by attending school open days together prior to the secondary school application process. Students can directly discuss possible career or school paths, their inclinations among these possibilities, and their explanations for the choices they are about to make (MKIK Gazdaság- és Vállalkozáskutató Intézet (GVI), 2020; Ikonen et al., 2018). Individuals also often consider the social costs of their educational decisions (Jæger, 2007) and tend to avoid the emotional burden of deviating from their friends' aspirations (Manzo, 2013).

A large body of evidence suggests that adolescents' educational preferences and choices are related to their friends' preferences (e.g., Carolan, 2018; Kiuru et al., 2007; Kretschmer and Roth, 2021; Sewell and Hauser, 1972; Zimmermann, 2018) or the broader peer context (e.g., Raabe and Wölfer, 2019; Rosenqvist, 2018; Smith, 2023). Nevertheless, some empirical findings have had different implications. For example, in the German context characterised by early ability tracking, Lorenz et al. (2020) suggested that friends could only influence educational expectations in schools with diverse educational tracks. Furthermore, a recent Hungarian study reported no direct effects of friends' and desk mates' secondary school choices on students' choices (Keller, 2023).

1.2.2.2. Access to peers' educational resources

Adolescents can have access to relevant information through their peers' resourceful parents (Coleman, 1988; Lin, 2001) and can adjust their educational preferences according to such knowledge (Carolan and Lardier, 2018; Cherng, Calarco, and Kao, 2013; Choi et al., 2008; Coleman, 1988; Crosnoe, 2004;

Crosnoe, Cavanagh and Elder, 2003; McDermott et al., 2020). More educated parents tend to be more involved in educational matters, better informed, and more ambitious about educational options (e.g., Bandura et al. 2001; Bourdieu and Passeron, 1977; Coleman 1988; Foley, Gallipoli and Green, 2014; Sewell and Hauser 1993). Peers with high parental education levels can make this type of academic knowledge accessible to adolescents (Carolan and Lardier, 2018; Choi et al., 2008; Coleman, 1988). Naturally, the parental resources of peers can also have an indirect effect by influencing the educational preferences of peers (Choi et al., 2008).

1.2.2.3. Peer Effects and Students from a less Advantaged Background

Students from less privileged family backgrounds may be particular beneficiaries of the educational resources of their peers (Burgess and Umaña-Aponte 2011; Lessard and Juvonen 2019; Smith, 2023; Sokatch 2006; Wohn et al., 2013). Thus, information and academic norms, values, or motivations accessed through friends or peers may help students from underprivileged backgrounds develop preferences for challenging academic options.

1.2.2.4. Friendship selection based on similar aspirations

Friendships are often selected on the basis of similarities between individuals along relevant dimensions (Brown and Larson, 2009; McPherson, Smith-Lovin and Cook, 2001). Therefore, in order to accurately measure the influence of similarity between friends, it is essential to distinguish between the effect of choosing friends based on shared educational aspirations and academic performance and the effect of social influence (Brown and Larson, 2009; Steglich, Snijders and Pearson, 2010; Ryan, 2001; Veenstra and Dijkstra, 2012).

Easily observable traits may be more relevant to friendship selection than unobservable traits (de Klepper et al., 2010; van Duijn et al., 2003). Aspirations inspire individuals to strive for their goals (Trebbels, 2015), and this can lead to visible behaviours, such as exerting effort to achieve the academic results necessary to achieve these goals. Students preparing for competitive secondary schools often exhibit academically driven behaviours, such as completing their homework, demonstrating good behaviour, and actively participating in class. Students from affluent backgrounds may possess a form of 'collective intelligence', which refers to their shared knowledge of the education system and how to navigate it effectively (Nash, 2005), and students with shared 'collective intelligence' may befriend each other.

Previous studies suggest that friendship selection contributes to friends' similar educational aspirations with respect to the highest level of education (Kretschmer and Roth, 2021; Lorenz et al., 2020; Mundt and Mundt, 2020). Regarding more indirect measures of students' aspirations, indicators

of easily observed behavioural engagement, rather than emotional and cognitive aspects of school engagement, may play a role in selecting friends, while also controlling for similarity in academic achievement and socioeconomic background (Wang et al., 2018). There is also empirical evidence to suggest that more intrinsic academic attributes, such as growth mindset, perseverance, and overall value of learning, may be important in selecting friends (Burgess et al., 2020). However, the latter study did not control for the contribution of academic achievement or parental background to friendship choice. These factors may confound the results for intrinsic attributes.

1.2.2.5. The role of peers' academic achievement

Social comparison is often used to assess one's own performance and prospects (e.g., Festinger, 1954; Mussweiler, 2009). Negative contrast with high achievers can lead to a downward adjustment of individuals' self-evaluations and ambitions (e.g., Marsh, 1991; Rosenqvist, 2018). Relevant standards of comparison can also provide students with an interpretative framework, leading to the assimilation of adolescents' academic performance to that of their friends (Huguet et al., 2009), which is supported by several previous studies (e.g., Cook, Deng and Morgano, 2007; Lomi et al., 2011). In turn, better school performance may lead adolescents to adjust their educational preferences higher (e.g., Breen and Goldthorpe, 1997). The negative and positive effects of social comparison with peers' academic performance may also coexist (Seaton et al., 2008). Therefore, peers' academic achievement is controlled for in the empirical analyses, as it may have a direct effect on students' aspirations or an indirect effect through its effect on peers' academic achievement.

Meanwhile, academic achievement as an observable attribute may influence the choice of friends among classmates (de Klepper et al., 2010; van Duijn et al., 2003). Several previous studies have provided evidence that academic achievement influences the process of selecting friends (Flashman 2012; Gremmen et al., 2017; Lomi et al., 2011; Rambaran et al., 2017; Torlò and Lomi, 2017; Smirnov and Thurner, 2017).

Some studies have shown that students are more likely to end friendships with friends whose academic performance differs from their own, rather than trying to match their friends' performance (Flashman, 2012; Smirnov and Thurner, 2017). More specifically, Gremmen et al. (2017) highlighted the importance of academic achievement in choosing friends, especially when forming friendships in new social circles.

Aspirations and achievement are often linked (Gutman and Akerman, 2008; Zhang et al., 2011). In the context of the present paper, this may be especially the case when aspirations directly measure ambitions for academic achievement. Therefore, when considered simultaneously, only the more observable academic achievement is assumed to play a role in friendship selection.

1.3. Research Questions and Hypotheses

The research questions and hypotheses of the dissertation are introduced in the following and are structured by the empirical chapters of the dissertation. The numbering of the hypotheses in the thesis synopsis (continuous numbering for the entire thesis) is different from the respective empirical chapters.

RQ1: Do peers affect adolescents' educational aspirations?

RQ1b: Does social selection, social influence, or both contribute to similar educational aspirations among friends?

Empirical chapter: Friends Can Help to Aim High: Peer Influence and Selection Effects on Academic Ambitions and Achievement

Hypothesis 1: Adolescents adjust their academic ambitions to their school friends' academic ambitions.

Empirical chapter: Peer Influence and Educational Preferences: Direct Influence or Access to Friends' Educational Resources?

Hypothesis 2: Adolescents adjust their secondary school track preferences to their school friends' preferences.

Hypothesis 3: Adolescents adjust their secondary school track preferences to the more academically-oriented option when their friends' parents have tertiary-level education.

Hypothesis 4: Educational preferences contribute to friendship selection.

Empirical chapter: Seeing Your Future when Looking at Your Peers? Friends' and Classmates' Effect on Student's Secondary School Track Preferences

Hypothesis 5: There is a positive association between students' educational preferences and the preferences of their friends.

Hypothesis 6: There is a positive association between students' educational preferences and the preferences of their classmates.

RQ2: Do academic achievement, educational aspirations, or both contribute to friendship selection?

Empirical chapter: Peer Influence and Selection Effects on Academic Ambitions and Achievement

Hypothesis 7: Academic achievement affects the creation and maintenance of friendship ties.

RQ3: Do peer effects on educational aspirations vary by students' parental background?

Empirical chapter: Peer Influence and Educational Preferences: Direct Influence or Access to Friends' Educational Resources?

Hypothesis 8: If adolescents do not have parents with a tertiary-level education, they are more likely to choose academically-focused educational paths when they have peers who have at least one parent with a tertiary-level qualification.

Empirical chapter: Seeing Your Future when Looking at Your Peers? Friends' and Classmates' Effect on Student's Secondary School Track Preferences

Hypothesis 9: The relationship between students' educational preferences and those of their peers varies by the parental background of the students and is more pronounced for students whose parents have lower levels of education.

2. Methodology

2.1. Data

The empirical analyses in the dissertation use data from the second, fourth, fifth and sixth waves of the MTA 'Lendület' RECENS research project 'Competition and Negative Ties' (e.g., Kisfalusi, Janky and Takács, 2019). A detailed explanation of the inclusion of specific waves and school classes is provided in the respective empirical chapters. The study was based on a panel sample that included all consenting students enrolled in the fifth grade of primary school in September 2013 from the school classes included in the sample. The study was completed in the spring of 2017, which was the students' last term in eighth grade and in primary school. Parents and children were given written information about the research before the study. Participation in the study required the consent of both the students and their parents.

Early leavers and late joiners were excluded from and included in the study, respectively. The initial phase consists of four waves, collected in the autumn and spring semesters of the fifth and sixth grades. The first phase was extended by two more waves, including a smaller sub-sample of schools, in the spring semesters when students were in the seventh and eighth grades.

The datasets include schools and classes of students from primary schools in Northern and Central Hungary. The data collection mainly focused on the network (e.g., friendship, bullying) and behavioural dynamics (e.g., school-related attitudes, educational aspirations and academic achievement) within the selected school classes. Schools with a larger number of Roma students were over-represented in the sample, as one of the main interests of the study was inter-ethnic relations between Roma and non-Roma students and the development of relational integration or segregation

on the basis of ethnicity. As a result, students from disadvantaged backgrounds and those with lower scores on the National Assessment of Basic Skills were overrepresented in the sample.

The first empirical chapter (Chapter 5 in the thesis) used a subsample of the fourth, fifth and sixth waves of data for the present analysis. The data were collected during the spring semester of the academic year 2014/2015 ($N_{\text{schools}}=34$, $N_{\text{classes}}=53$, $N_{\text{students}}=1054$), the 2015/2016 academic year ($N_{\text{schools}}=26$, $N_{\text{classes}}=39$, $N_{\text{students}}=743$), and the 2016/2017 academic year ($N_{\text{schools}}=25$, $N_{\text{classes}}=37$, $N_{\text{students}}=663$), respectively. Students were enrolled in the sixth, seventh, and eighth grades of primary school in these waves.

The second empirical chapter (Chapter 6 of the dissertation) used a subsample of the second, fourth, and fifth waves collected in the spring semesters of the academic years 2013/2014 ($N_{\text{schools}}=35$, $N_{\text{classes}}=58$, $N_{\text{students}}=1131$), 2014/2015 ($N_{\text{schools}}=34$, $N_{\text{classes}}=53$, $N_{\text{students}}=1054$) and, 2015/2016 ($N_{\text{schools}}=26$, $N_{\text{classes}}=39$, $N_{\text{students}}=743$), when students were enrolled in the fifth, sixth and seventh grades of primary school.

The third empirical chapter (Chapter 7 of the dissertation) uses the sixth wave of data collection, supplemented with data from the fifth wave. The data for the sixth wave was collected during the spring term of the 2016/2017 academic year. It included 37 classes from 25 schools with students who were enrolled in the eighth grade, the last grade of primary school, and were approximately 14.57 years old ($SD=.65$, $N_{\text{students}}=663$). The data for the fifth wave were collected during the spring term of the 2015-2016 academic year. The study included 39 classes from 26 schools with students who were in the seventh grade and around 13.63 years old ($SD = .71$, $N = 743$ students).

2.3. Analytical Strategy

2.3.1. Random Coefficient Multilevel Siena Analysis – Empirical Chapters: Friends Can Help to Aim High: Peer Influence and Selection Effects on Academic Ambitions and Achievement; Peer Influence and Educational Preferences: Direct Influence or Access to Friends' Educational Resources?

People who are connected tend to be similar in various ways (e.g., Kandel, 1978; Manski, 1993; McPherson, Smith-Lovin and Cook, 2001). This phenomenon can be explained by various mechanisms, one of which is *socialisation* (also referred to as assimilation or contagion, although the dissertation mainly uses the term *influence*). Individuals also tend to associate with people who are like them (known as *homophily* or *social selection*), or they are more likely to meet and form connections due to structural constraints (also known as *context*) (Feld, 1982; Manski, 1993; Steglich et al., 2010).

Two of the empirical studies in the dissertation (in chapters 5 and 6 of the dissertation) address this issue by applying Stochastic Actor-Oriented Models (SAOM) to analyse the co-evolution of network ties and attributes in the longitudinal network data. SAOM allow us to disentangle the effects of social selection and influence by estimating the interdependent effects of network processes and individual attributes on the evolution of two dependent variables, network ties and individual 'behaviour' (Steglich et al. 2010). The term 'behaviour' is used in a broad sense. It refers to an individual attribute that is expected to change over time - in this case, various measures of students' aspirations. The influence and selection effects are identified by modelling the changes in adolescents' aspirations and their friendship network over time from the perspective of actors (in this case, students within classes) who make decisions about forming, maintaining or terminating friendship ties and adjust their aspirations in light of changes in the aspirations of their network (school class) (Ripley et al. 2021).

For the empirical analyses, the implementation of Stochastic Actor-Oriented Models on multi-group datasets in *sienaBayes()* was used (Ripley et al. 2021). This approach can take into account that our data consisted of multiple groups with their network structure and can estimate parameters that vary between groups and parameters that are assumed to be non-varying between groups using Bayesian estimation (Kaplan and Depaoli, 2013; Ripley et al. 2021). This approach made it possible to disentangle the effects of social selection and social influence for the full sample while allowing for heterogeneity across classes.

The behaviour dependent variables are the following in the two empirical chapters. The academic ambitions in two school subjects were measured on an ordinal scale and were modelled separately. The secondary school track preferences focused on two options as binary outcomes: the grammar school track and the vocational secondary school track.

In this Bayesian framework, p -values of $p < .025$ for coefficients with a negative sign, and p -values of $p > .975$ for coefficients with a positive sign were accepted as convincing evidence that the parameters were negative or positive, respectively, and are shown in bold in the tables. The use of these thresholds is consistent with the frequentist approach, so they should only be used as guidelines.

2.3.2. *Generalized Structural Equation Models – Empirical chapter: Seeing Your Future when Looking at Your Peers? Friends' and Classmates' Effect on Student's Secondary School Track Preferences*

The third empirical chapter (Chapter 7 of the thesis) measures cross-sectional aspirations rather than longitudinal aspirations and uses Generalized Structural Equation Modelling (GSEM) to investigate whether students' educational preferences (whether they preferred the grammar school track) as

indicated on their secondary school application form were related to whether their friends and classmates prefer to enroll in this type of secondary school education.

Unlike regular SEMs, Generalized Structural Equation Models (GSEMs) can deal with different types of outcomes, such as binary, ordered or count responses. The main outcome variable is binary and measures the choice of secondary school track listed as the first preference on students' applications, more specifically whether their first choice was a grammar school education, and GSEMs implemented in Stata are used for the analysis (Huber, 2013).

GSEMs are not able to separate the effects of selection and influence. Therefore, the analysis controls for friendship selection based on students' similar preferences in their top choice of applications. To do this, two types of friendship nominations are distinguished. Stable friendships are friendships that existed during the semester of application and one year before, and all friendships, which include all friendships at the time of application.

3. Results

3.1. Friends Can Help to Aim High: Peer Influence and Selection Effects on Academic Ambitions and Achievement

The posterior means, posterior standard deviations, and posterior Bayesian p -values are reported from the SAOM for the most important results below. P -values close to 1 indicate a high probability of the parameter being positive given the data, model specification, and priors. In contrast, p -values that are close to 0 indicate a high probability that the parameter is negative, considering the data, model specification, and priors.

The study showed that changes in adolescents' academic ambitions were related to the ambitions of their friends in line with *Hypothesis 1*. Over time, students modified their academic ambitions in the two subjects to be more in line with those of their friends, as indicated by the positive coefficient of the average similarity effects ($\theta_{Hungarian} = 1.40$, $SD_{Hungarian} = .71$, $p_{Hungarian} = .98$, $\theta_{Mathematics} = 1.26$, $SD_{Mathematics} = .70$, $p_{Mathematics} = .97$), although the p -value for mathematics was slightly above the accepted threshold. This suggests social influence on academic ambitions among friends, as the models separated the influence of friends from the tendency to form bonds based on similar academic ambitions.

Nevertheless, the influence tables showed that the mechanisms underlying the tendency towards similarity were slightly different for the two subjects. In Hungarian literature, the attractiveness of friends with high ambitions was more pronounced than that of friends with low ambitions, while the opposite process was observed in mathematics.

Academic ambitions in the two school subjects analysed did not contribute to the creation, maintenance or dissolution of friendship ties among Hungarian adolescents. On the other hand, academic achievement seemed to be a salient and relevant attribute for friendship selection (*Hypothesis 7*), but only in Hungarian literature ($\theta_{\text{Hungarian}} = .19$, $SD_{\text{Hungarian}} = .09$, $p_{\text{Hungarian}} = .98$), but not in mathematics ($\theta_{\text{Mathematics}} = .10$, $SD_{\text{Mathematics}} = .10$, $p_{\text{Mathematics}} = .83$). The students were more inclined to become and/or maintain friendships with other students who had similar academic achievement in Hungarian literature. This remained true even when taking into account similarities in ambitions, gender, parental educational background, or ethnic background. Friends' academic achievement did not have a direct effect on students' academic ambitions in either school subjects.

3.3. Peer Influence and Educational Preferences: Direct Influence or Access to Friends' Educational Resources?

The introduced results of the second empirical chapter (Chapter 6 in the dissertation) should be interpreted the same way as results for the previous empirical study (Chapter 5 in the dissertation). The results showed that the average preferences of friends did not have a direct positive effect on the formation of students' grammar school track preferences opposing *Hypothesis 2* ($\theta = -1.65$, $SD = 1.07$, $p = .05$), while having friends who preferred the vocational secondary school track had a negative impact on students' preferences for that track ($\theta = -3.41$, $SD = 1.40$, $p < .001$).

According to the evidence presented in the study, friends may have had an indirect influence on whether adolescents developed preferences for the grammar school track. This means that friends' influence may be channelled through their parental resources. Having friends who have at least one parent with tertiary education level positively influenced students' preferences for the grammar school track in line with *Hypothesis 3* ($\theta = 1.40$, $SD = .71$, $p = .98$). The effect of friends' parental background on students' secondary school track preferences did not vary by students' family background (*Hypothesis 8*).

Regarding friendship selection, students appeared to be more likely to form and maintain friendships with classmates who had similar track preferences (*Hypothesis 4*) ($\theta_{\text{grammar school track}} = .48$, $SD = .16$, $p > .99$). Moreover, students who preferred the vocational secondary school track were more likely to form and maintain friendships with others who also preferred the vocational secondary school track ($\theta_{\text{vocational secondary school track}} = .31$, $SD = .15$, $p > .98$).

Nevertheless, the results on peer selection should be treated with caution throughout the dissertation, as the egoX effects, which model whether students with different secondary school track preferences differ in their activity with respect to outgoing friendship nominations, did not converge

and therefore had to be excluded from the models, which may have implications for the estimated parameters of the effects modeling homophily. Therefore, the hypothesis related to friendship selection cannot be accepted or rejected conclusively on the basis of the available empirical evidence.

3.4. Seeing Your Future when Looking at Your Peers? Friends' and Classmates' Effect on Student's Secondary School Track Preferences

The reported coefficients of GSEM results should be interpreted as the average marginal effects in logistic regression models. The results of the Generalized Structural Equation Models showed a negative association between the grammar school track preferences of friends and classmates in their applications and the preferences of adolescents for the grammar school track in their applications opposing *Hypothesis 5* and *Hypothesis 6* (e.g., $AME_{stable\ friends} = -.21$, $SE_{stable\ friends} = .03$; $AME_{classmates\ wo\ stable\ friends} = -.37$, $SE_{classmates\ wo\ stable\ friends} = .06$). Meanwhile, the preferences of friends for the grammar school track in the school year before secondary school applications were found to have a positive but weaker correlation with adolescents' preferences for the grammar school track in their own applications supporting *Hypothesis 5* ($AME_{stable\ friends} = .08$, $SE_{stable\ friends} = .02$). Thus, friends' 'lagged' (previous) preferences had a positive association with students' preferences in their applications but only when friends' preferences in their applications were also accounted for. Overall, the results did not provide sufficient support for the positive association between friends' educational preferences (*Hypothesis 5*). Peer effects on students' aspirations did not vary by students' family background opposing *Hypothesis 9*.

4. Main Scientific and Theoretical Contributions of the Study

To date, only a few studies have used SAOM to analyse the influence of friends on educational aspirations, taking into account the possible confounding effect of friendship selection (e.g., Kretschmer and Roth, 2021; Lorenz et al., 2020; Mundt and Mundt, 2020). Unlike the present thesis, none of these studies focused on primary school students. Nevertheless, in stratified education systems, peer exposure prior to tracking may be particularly relevant, as tracks are typically composed of individuals with similar academic achievement and parental backgrounds (Shavit and Blossfeld, 1993). In addition, the studies in the dissertation examine how social influence may vary across different indicators of aspirations and how different characteristics of peers, such as their aspirations, parental background and academic achievement, may affect students' aspirations. The broader peer context is also considered in one of the empirical studies.

The results of the three empirical chapters show that the positive influence of friends on academic aspirations (RQ1, RQ1b) is most evident for grade aspirations in two school subjects. Thus, friends' aspirations in primary school can have a positive effect on aspirations that have immediate follow-up and are not bound by external limits. Academic ambitions in two school subjects are followed by end-of-term assessment and grading. As 'grading on a curve' is not a common practice in Hungarian primary schools, the school grades achieved by others do not limit the opportunities of others to achieve the same results.

Regarding the formation of students' secondary school track preferences before the application period, there was no direct positive influence of friends' preferences on students' grammar school track preferences (RQ1, RQ1b). In addition, friends' preferences had a negative effect on students' preferences for the upper secondary vocational track. The influence of friends on students' preferences for the grammar school track prior to the applications was more indirect and channelled through the resources of friends' parents (RQ1), showing that having friends from affluent backgrounds may have a positive effect on students' preference for the most academic secondary school track.

These results are consistent with previous findings that educated parents are more interested in educational issues, more familiar with the education system, and more likely to prefer the most academic-oriented path for their children. More educated parents are often considered to have an information advantage that may have an impact on the attitudes and choices of other parents and students (e.g., Carolan and Lardier, 2018; Cherng, Calarco, and Kao, 2013; Coleman, 1988; Crosnoe, 2004; GVI, 2020). The contribution of friends' parental background to developing students' educational preferences highlights that schools are social institutions where social networks play an important role alongside formal education (e.g., Coleman, 1988).

In terms of peer effects on preferences at the time of application to secondary school, there was a negative relationship between students' preferences for the grammar school track and the preferences of their friends and classmates (RQ1). These somewhat surprising results are consistent with the lack of a positive effect before the application period on preferences for the grammar track and the negative effect on preferences for the vocational secondary school track. The findings may be explained by perceived constraints that prevent or encourage individuals to have certain aspirations or dreams for themselves (Tarabini and Curran, 2018).

Several previous studies that have reported adjusting to friends' aspirations focused on aspirations with long-term consequences, such as the highest level of education (e.g., Kretschmer and Roth, 20-21; Raabe and Wölfer, 2019; Rosenqvist, 2018). In terms of aspirations for long-term educational outcomes, students do not need to take into account the availability of places and their

perception of the likelihood of being admitted to different types of education, as opposed to the type of secondary school they prefer.

According to the results, secondary school preferences prior to the application may contribute to the creation and maintenance of friendship ties (RQ1b). This finding suggests that the clustering of educational preferences in social networks may reinforce pre-existing inequalities (DiMaggio and Garip, 2012). Secondary school preferences may play a role in friendship selection because these preferences are likely to manifest in observable behaviours associated with individuals working towards these goals (Trebbels, 2015).

Turning to the selection of friends based on academic ambitions and academic achievement in the two school subjects, only similar academic achievement in Hungarian literature had an impact on friendship selection (RQ2). Academic achievement, as an easily observable characteristic for peers within the same school class, may signal other desirable characteristics to peers, ultimately leading to friendship formation (Lomi et al., 2011; Torlò and Lomi, 2017). Academic achievement in Hungarian literature may be particularly relevant in this regard because reading ability may be associated with certain individual behaviours and characteristics, such as enjoyment of reading in leisure time (Wigfield, 1997) or parental background (Rogiers, Van Keer, and Merchie, 2020). These characteristics may be signalled through language style and cultural differences and are likely to be associated with school performance.

Overall, the results for social selection should be treated with caution throughout the dissertation due to the exclusion of ego effects from the models, which may bias the estimates for the similarity effects.

Academic aspirations and academic performance in the two subjects may be more directly related than secondary school preferences and average academic performance, and this may explain why academic aspirations did not contribute to friendship selection in the Hungarian literature beyond the contribution of academic performance.

The different social influence and social selection effects on academic ambitions and academic achievement in the two school subjects are consistent with the notion that academic motivation is a domain-specific concept and should be investigated accordingly (Chow et al., 2018; Green, Martin and Marsh 2007; Jansen, Lüdtke and Schroeders, 2016).

5. References

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6. List of Publications Related to the Dissertation

Submitted manuscripts which are under review at the moment:

Vit, E. '(Not) Seeing your Future when Looking at your Peers? Friends' and Classmates' Effect on Students' Secondary School Track Preferences'

Vit, E., Bianchi, F., Castellani, M. and Takács, K. (2021) 'Do Friends Aspire? Peer Influence and Selection Effects for Academic Achievement and Aspirations'

Conference presentations (the speaker was the author of the dissertation):

Vit, E. (2019) 'Peer Effects on Educational and Academic Aspirations in Hungarian schools', *The 4th European Conference on Social Networks (EUSN 2019)*. Zurich, Switzerland, 9-12 September.

Vit, E., Bianchi, F., Castellani, M. and Takács, K. (2021) 'Do Friends Aspire? Peer Influence and Selection Effects for Academic Achievement and Aspirations', *The 13th annual International Network of Analytical Sociology (INAS)*. Online, 29-30 May.

Vit, E., Bianchi, F., Castellani, M. and Takács, K. (2021) 'Social influence and academic aspirations: mediated through friends' "aspirations milieu" or expectancies for success?', *Networks 2021: A Joint Sunbelt and NetSci Conference*. Online, 5-10 July.