

# The Link between Social and Structural Integration: Co- and Interethnic Friendship Selection and Social Influence within Adolescent Social Networks

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**Abstract:** Assimilation theories argue that social ties with majority-group members enhance the structural integration of ethnic minority members, whereas under certain conditions, coethnic social ties can also benefit minority members' socioeconomic outcomes. We examine these propositions through a social network perspective, focusing on friendship networks and educational expectations in adolescence, during which peer socialization is crucial. Longitudinal data from 1,992 adolescents in 91 classrooms allow us to investigate co- and interethnic social selection and social influence processes as well as their aggregated outcomes. In terms of friendship selection, we find that Turkish-origin minority adolescents in Germany have distinct preferences for friends with high educational expectations, among both co- and interethnic peers. In contrast, social influence on Turkish-minority adolescents' educational expectations is not uniform: only majority-group friends exert a significant (positive) influence. Our results emphasize that bridging social capital gained from social ties with majority-group members enhances ethnic minority adolescents' educational integration.

**Keywords:** assimilation; integration; adolescent development; social network analysis; SAOMs; social capital

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
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WESTERN societies are characterized by ethnic stratification in structural outcomes such as economic well-being. A major share of this ethnic inequality can be explained by systematic variation in parental education and occupation (see Heath, Rethon, and Kilpi 2008). In addition to these intergenerational effects, assimilation theories highlight the role of social integration (sometimes also referred to as relational integration) in structural integration (sometimes also referred to as economic integration). In this regard, it has been well established that *social ties to majority-group* members provide valuable resources that can enhance the socioeconomic outcomes of ethnic minority members (see Drouhot and Nee 2019). Segmented assimilation theory (Portes and Rumbaut 2001; Portes and Sensenbrenner 1993) and recent revisions of the assimilation concept (Nee and Alba 2013) extend this view. These theoretical accounts highlight that for ethnic minority members living in social environments that are not conducive to achievement, resources emerging within *coethnic networks* can also be effective for successfully navigating mainstream society.

Despite extensive research on the role of social ties in labor market integration (e.g., Kanas et al. 2012), we know little about the role of social relationships in the educational achievements of ethnic minority youth (for exceptions, see Flashman [2014] and Wölfer, Caro, and Hewstone [2019]). Research in the context of education

often relies on only vague measures of social integration, such as the share of ethnic minority students within schools and classrooms (e.g., Seuring, Rjosk, and Stanat 2020). In contrast, *social network* data provide information regarding which students actually have social ties with one another and thus allow for a more precise examination of social integration and peer socialization processes (DiMaggio and Garip 2012; Stadtfeld et al. 2019). One important social network mechanism through which social integration should affect structural integration is *social influence*. In the educational context, the academic performance of co- and interethnic “significant others,” such as friends, might affect the performance of ethnic minority students. However, social influence processes might function differently between co- and interethnic social ties (Brechtwald and Prinstein 2011). Whether such differences exist is still underexamined. Another mechanism through which social integration is linked to structural integration is the way in which ethnic minority members *select* their social ties. This is because the social influence of co- and interethnic social ties can enhance ethnic minority members’ educational success only when these ties provide important resources (Zhou 1997). Although a few studies have investigated ethnic differences in the academic characteristics of friends (Flashman 2012; Lorenz, Boda, and Salikutluk 2021), the extent to which such differences translate into ethnic inequality in educational attainment is still unknown.

We aim to close these gaps by examining co- and interethnic friend selection and social influence processes within adolescent social networks. In this way, we can provide novel insights into essential assimilation processes and establish an empirical link between the social and structural integration of ethnic minority adolescents. Our empirical account focuses on the interplay between co- and interethnic *friendships* (as an indicator of social integration) and *educational expectations* (as an indicator of structural integration). Friends play highly important roles during adolescence. In schools, adolescents build strong informal social networks, and the frequent and repeated interactions within these networks lead to the establishment of distinct social norms and peer milieus (Raabe and Wölfer 2019). As a result, adolescents adapt their attitudes and behaviors toward those of their friends (e.g., Gremmen et al. 2017).

Adolescents’ expectations about the educational qualifications they will attain—their educational expectations—are a vital indicator of structural integration because they are fundamental determinants of educational attainment and a means for intergenerational status reproduction (Bozick et al. 2010; Morgan 2005; Sewell, Haller, and Portes 1969). Many ethnic minority groups have higher educational expectations than their majority counterparts despite their lower average academic achievement and socioeconomic status (SES)—a phenomenon also known as the *aspiration–achievement paradox* (Kao and Tienda 1998; Salikutluk 2016). This phenomenon has been documented for several ethnic minority groups in various countries (Brinbaum and Cebolla-Boado 2007; Gil-Hernández and Gracia 2018; Jonsson and Rudolphi 2011; Teney, Devleeshouwer, and Hanquinet 2013; van de Werfhorst and Van Tubergen 2007).

In line with segmented assimilation theory, social influence among coethnic friends might lead those ethnic minority adolescents who live within structurally disadvantaged segments of society to maintain (or even increase) their high ed-

educational expectations over time. At the same time, friendship ties with both majority-group members and members of other minority groups might lead minority adolescents to reconsider their high educational expectations. To test these propositions, we use longitudinal data from the Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU) and apply both multilevel regressions and techniques for the analysis of social network panel data. We focus on Turkish-origin minority adolescents (hereafter referred to as Turkish-minority adolescents) in Germany, where they are one of the largest minority groups. In Germany, Turkish-minority adolescents often live in segregated areas (Kristen 2008) and are among the most structurally disadvantaged ethnic minority groups (Kristen and Granato 2007). However, high educational expectations are particularly well documented for them (Salikutluk 2016).

Our results provide novel evidence on the link between social and structural integration by revealing that Turkish-minority adolescents have distinct preferences for friends with high educational expectations and that this applies to both co- and interethnic friendships. Simultaneously, social influence on Turkish-minority adolescents' educational expectations is not uniform but seems to be limited to friendships with majority-group members.

## The Unfolding of Social Capital through the Social Influence of Friends

The role of social influence in structural inequality is well captured in social capital theory. Social capital comprises resources that can only be accessed through social ties to other actors (Coleman 1988). On the individual level, social capital unfolds through the (positive) effects of social ties on human capital formation (Portes 1998). In the context of our research question, friends would be sources of social capital if they initiated upward changes in adolescents' educational expectations. Such a process of social influence can emerge through two main mechanisms (DiMaggio and Garip 2012). First, social norms within social networks shape adolescents' attitudes and behavior (Prentice 2008; Sewell et al. 1969). For instance, friends might attach a high value to education and transform this attitude into a social norm that encourages students to raise their educational expectations. Second, from a rational-choice point of view, peers can affect individual preferences by providing new information and resolving uncertainty (Flap and Völker 2013). For instance, the exchange of information about the meaning and importance of education among friends can encourage students to raise (or lower) their educational expectations (e.g., Lorenz et al. 2020).

### *Bonding and Bridging Social Capital Gained from Co- and Interethnic Social Ties*

A standard implication derived from social capital theory is that social ties to majority-group members can provide *bridging social capital* for ethnic minority members (Kanas et al. 2012), such as exposure to the language of the host country

(Chiswick and Miller 1996) or valuable, nonredundant information (Greenberg and Fernandez 2016). This prediction is based on the argument that social ties to out-group members close structural holes and provide access to information that is unavailable within the in-group (Burt 1992). In this sense, out-group contact with both majority-group members and members of other minority groups should be beneficial for the structural integration of ethnic minority members, as interethnic social ties can function as bridging social capital and boost ethnic minority adolescents' educational expectations (Wölfer et al. 2019).

Variants of the assimilation concept, such as segmented assimilation theory and neoassimilation theory, also build upon social capital theory. They stress, however, that coethnic social ties can also be beneficial for ethnic minority members' socioeconomic outcomes (Nee and Alba 2013). This line of argumentation does not deny the benefits of interethnic social ties and acknowledges that social capital gained from coethnic social ties can be limited. It emphasizes, however, that dense coethnic networks can provide *bonding social capital* in the form of trust, solidarity, mutual support, social control, and social norms conducive to achievement (Kao 2004; Zhou and Bankston 1998). Such bonding social capital is assumed to benefit ethnic minority members when available interethnic ties provide no, or harmful, resources (Portes and Sensenbrenner 1993). For instance, strong coethnic ties are assumed to have helped Southeast Asian minority families in the United States maintain their high educational aspirations even though they themselves had few socioeconomic resources and were surrounded by socioeconomically disadvantaged out-group members (Zhou 1997).

Friendship networks among adolescents are heavily segregated in ethnic and racial terms (Boda, Néray, and Snijders 2020; Leszczensky and Pink 2019; Moody 2001), and many ethnic minority adolescents, including those of Turkish origin in Germany, are often surrounded by disadvantaged peers (Flashman 2012; Lorenz et al. 2021). The initially high educational expectations of these adolescents (see Salikutluk 2016) might lead to the establishment of social norms within coethnic networks that support academic striving. Social influence among coethnic friends might then create social capital on an aggregate level by stabilizing (or even increasing) ethnic minority adolescents' high educational expectations over time. Such a process would, however, require that ethnic minority adolescents' educational expectations are susceptible to social influence in general and to coethnic social influence in particular. Moreover, the outcomes of co- and interethnic social influence depend on whether ethnic minority adolescents select friends who have high educational expectations, and the selection of coethnic friends might work differently in this regard than the selection of interethnic friends. In the following two sections, we will discuss susceptibility to co- and interethnic social influence as well as the selection of co- and interethnic friends with different levels of educational expectations.



## *The Social Influence of Co- and Interethnic Friends on Educational Expectations*

Gender, age, social anxiety, and personality characteristics (e.g., autonomy or the ability to self-direct one's behavior and engage in independent thinking) moderate susceptibility to social influence (Brechwald and Prinstein 2011). We do not expect these attributes to vary systematically between majority and ethnic minority targets of social influence. Therefore, we do not expect susceptibility to the social influence of friends on educational expectations to differ between these groups in general. Indeed, research from the United States shows no racial differences in susceptibility to social influence (Cheng and Starks 2002); however, differences in other contexts and samples may exist.

However, there are reasons to expect differences in the social influence of, on the one hand, coethnic and, on the other hand, interethnic friends. Regarding the direction of these differences, theory leads us to derive two contradictory assumptions. Coethnic minority friends might develop an in-group solidarity that does not exist among interethnic friends because of shared experience as well as shared attachment to one's country or region of origin (Kao 2004; Zhou 1997). In our case, coethnic friends might have parents with similar migration histories, similar experiences of socioeconomic deprivation, and similar wishes regarding the educational outcomes of their offspring. This shared experience might knit coethnic minority friends closer together and pave the way for social norms that value high educational goals. As a result, the social influence of coethnic minority friends on educational expectations could be stronger than the social influence exerted by majority-group friends (hereafter referred to as *majority friends*) and friends belonging to other minority groups (hereafter referred to as *other-minority friends*).

Alternatively, the concept of structural holes suggests that whereas close-knit social networks tend to bond redundant information, social ties bridging two or more previously unconnected networks provide access to novel information and, thus, access to particularly valuable social capital (Burt 1992). A lack of knowledge about the education system is often offered as one explanation of why some ethnic minority adolescents have comparatively high educational expectations (Kao and Tienda 1998). Majority friends, as well as other-minority friends, might fill this gap by providing nonredundant information about the feasibility of one's educational expectations and thus trigger ethnic minority students to reconsider their educational expectations. This might particularly be the case if the information provided by interethnic peers deviates significantly from the information provided by coethnic friends (Kanas et al. 2012; Simon, Aikins, and Prinstein 2008). Consequently, the social influence of interethnic friends might lead to more substantial changes in ethnic minority adolescents' educational expectations than the social influence of coethnic friends.

### *The Selection of Co- and Interethnic Friends Based on Their Educational Expectations*

In addition to a possible difference in the social influence of co- and interethnic friends, the link between the social and structural integration of ethnic minority adolescents is also determined by how they select co- and interethnic friends. This is because the benefits from becoming part of the majority group depend upon which stratum of the majority society absorbs the (former) minority members (Nee and Alba 2013; Zhou 1997). In our case, whether the social influence of co- and interethnic friends leads to reductions or increases in educational expectations depends on the average educational expectations of these friends.

Generally, adolescents befriend peers based on opportunities and individual preferences. Studies in the United States show that variation in opportunities to connect with lower- and higher-achieving peers accounts for racial differences in the average achievement level within students' friendship networks (Flashman 2012; Moody 2001). Another key driver of friendships is homophily, which describes the tendency (sometimes also referred to as a preference) to connect with others who are similar in salient characteristics, such as SES, ethnicity, race, and gender (McPherson, Smith-Lovin, and Cook 2001). As a result, peers of the same ethnic background often cluster together in friendship networks, less frequently befriending peers from other ethnic backgrounds (Moody 2001; Smith, Maas, and van Tubergen 2014).

Although no racial differences have been reported in preferences for higher-achieving friends (Flashman 2012), Turkish-minority adolescents in Germany seem to have distinct preferences for befriending highly engaged and high-achieving peers (Lorenz et al. 2021). High-aspiring peers might, therefore, also appear to be particularly attractive friends for these students. Consequently, ethnic minority students might not necessarily select friends with similar educational expectations but, instead, prefer peers with higher educational expectations over peers with lower expectations (independent of their own expectations).

The conditions for interethnic friendships are still understudied. Therefore, it is an empirical question whether ethnic minority adolescents also prefer interethnic peers with high educational expectations over other interethnic peers as friends. However, because of the generally higher educational expectations among ethnic minority youth (particularly among the Turkish group in Germany; see below), one would expect lower variance in the educational expectations of Turkish-minority peers than among peers who belong to the majority group. As a result, the preference for high-aspiring friends among Turkish-minority youth might be fulfilled more often in the case of coethnic than of majority peers.

## Educational Expectations among Turkish-Minority Youth in Germany

Individuals of Turkish origin form one of the largest ethnic minority groups in Germany. Compared with their native peers, students from Turkish-origin families score lower on standardized achievement tests (Stanat et al. 2017, 2019), attend lower-track schools more often (ibid.), and earn lower educational qualifications

(Kristen and Granato 2007). However, they expect to earn higher educational qualifications than majority members do, despite their lower scholastic performance and lower SES (e.g., Salikutluk 2016). This pattern can also be observed among Turkish-minority members in other European countries, such as the Netherlands (Hadjar and Scharf 2019) and Sweden (Jonsson and Rudolphi 2011). These high educational expectations seem to reduce some of the disadvantages these students face because of their low SES, for instance, by leading to ambitious choices for track placement within ability-tracked secondary schooling systems (Dollmann and Weißmann 2020). It remains unclear, however, why Turkish-minority students do not adjust their educational expectations downward to match their comparatively low scholastic performance over time.

## Data and Measurements

### *Data*

We use data from the first two waves of the German CILS4EU (Kalter et al. 2016), designed to study children of immigrants and their majority peers starting at age 14 in four countries (Germany, Sweden, England, and the Netherlands). We focus on the German sample because only in Germany were both of our outcome variables (i.e., friendship nominations and educational expectations) measured in two subsequent survey waves. This is a requirement for applying our longitudinal social network analysis approach (stochastic actor-oriented models, or SAOMS; see below). School surveys were conducted with 5,013 fourteen-year-old students in 144 schools and 271 classrooms in the first wave ( $T_1$ ). The students were interviewed again one year later ( $T_2$ ).

### *Analytic Sample*

CILS4EU's sociometric fieldwork report (Kruse, Weißmann, and Jacob 2016) and previous applications of multilevel SAOMs (e.g., Boda 2018) propose the exclusion of network settings in which more than 25 percent of the network units did not participate in the survey. We follow this approach and restrict the data to classrooms in which at least 75 percent of the students who participated in the first wave also participated in the second wave. The analytic sample comprises 1,992 students nested in 91 classrooms and 63 schools.

### *Dependent Variables*

Multilevel SAOMs enable us to simultaneously examine selection and social influence processes in one model (details on the applied method will be described below). Thus, our models contain two dependent variables. Our first dependent variable is friendship. In both waves, students nominated up to five classmates as their best friends ("Who are your best friends in class?"), from which we constructed the *friendship networks* in each classroom.

The second dependent variable is students' *educational expectations*. Expectations were measured with the question, "And what is the highest level of education that

you think you will actually get?" at grade 9 (T<sub>1</sub>) and grade 10 (T<sub>2</sub>). We categorized the answers as follows: "no qualification/qualification from lower secondary school," "qualification from intermediate secondary school," "qualification from upper secondary school," and "university degree." We use this as an ordinal scale, in line with the SAOM requirements for individual-level independent variables (Ripley et al. 2021).

### *Independent Variables*

The variable indicating an adolescent's ethnic background was created based on the different *ethnic group* classifications described in Dollmann, Jacob, and Kalter (2014). The categorization was based on students', their parents', and their grandparents' country of birth. In the sample, 843 students belong to the majority group, 381 have a Turkish background, and 768 have another ethnic background. The latter category represents a diverse mix of origin regions: Poland (106 students), the former Soviet Union (104 students), former Yugoslavia (90 students), Italy (67 students), other European countries (145 students), Lebanon (30 students), Asia (91 students), Africa (59 students), and Latin and North America (28 students), as well as 48 students with an unknown foreign origin. In addition to the majority group, this diverse "other-minority group" forms a second out-group with which Turkish-minority members could form interethnic social ties.

We use the higher of the parents' scores on the International Socio-Economic Index of Occupational Status (*HISEI*) (Ganzeboom, De Graaf, and Treiman 1992) as an indicator of the students' SES. This information was obtained from interviews with the parents. If the parents did not participate in the survey, we used information on the parents' occupational status provided by the students.

For *scholastic performance*, we computed latent achievement scores for T<sub>1</sub> based on five indicators. These included teacher-assigned grades in German, mathematics, and English as well as the sum scores of a cognitive ability test and a language ability test completed as part of CILS4EU. Cognitive abilities were measured using a language-free test based on solving figural problems. Language skills were measured with a verbal subtest of the German cognitive achievement test "KFT 5–12+ R." We created the latent factor scores from a one-factor confirmatory factor analysis model. To consider changes in scholastic performance over time, we additionally created a variable that indicates differences in grade point averages (as calculated from the grades in German, mathematics, and English) between T<sub>1</sub> and T<sub>2</sub> (*GPA (within)*).

*Gender* and the *secondary school track* attended (lower secondary, comprehensive, and intermediate secondary school) serve as further control variables in all models.

## Analytic Procedure

### *Multilevel Mixed-Effects Ordinal Logistic Regression*

In the first step, we test for the effects of the shares of majority, Turkish-minority, and other-minority friends on educational expectations. This allows us to examine

in which direction majority, Turkish-minority, and other-minority friends might influence Turkish-minority adolescents' educational expectations (i.e., upward or downward changes). Following the procedure proposed by Ragan et al. (2019), we estimate multilevel mixed-effects ordinal logistic regressions, as these models come closest to our social network analysis framework (see below). The models have three levels: two time points  $k = 1, \dots, n_{ij}$  are nested within  $j = 1, \dots, n_i$  individual adolescents who are nested within  $i = 1, \dots, n$  classrooms. By using the cumulative probabilities for the  $c$ -ordered categories ( $c = 1, \dots, C$ ), the model can be written as follows:

$$\log \frac{P_{ijkc}}{(1 - P_{ijkc})} = \gamma_c - (x'_{ijk}\beta + v_{ij} + v_i),$$

where  $\gamma$  is an underlying latent variable that is related to the ordinal response  $Y$  through a threshold,  $x'_{ijk}$  is a covariate vector,  $\beta$  represents unknown regression parameters,  $v_i$  is the unknown random effect at level 3, and  $v_{ij}$  is the unknown random effect at level 2 (see Raman and Hedeker 2005). The vector of time-varying covariates includes the number of nominated friends, GPA (within), and the share of majority, Turkish-minority, and other-minority friends (see Figure 2). Ethnic background, school form attended, gender, HISEI, and scholastic performance are time-constant covariates. All variables have been centered around the sample mean.

### *Random-Coefficient Multilevel SAOMs*

In the second step, we apply SAOMs, which allow for the simultaneous analysis of changes in social networks and in individual characteristics (Snijders 2017). In this way, we can test for possible group differences in the selection of co- and interethnic friends and the social influence of co- and interethnic friends. The technical and mathematical foundations of SAOMs are described in detail in other work (Snijders 2017; Snijders, Van de Bunt, and Steglich 2010)—in the following, we will explain the concept. SAOMs rely on simulations to infer the social mechanisms that potentially underlie the observed changes in a social network. The simulations reconstruct the creation of an observed social network as a sequence of many small changes through an actor-oriented perspective in which actors (e.g., students in a classroom) control their outgoing ties (i.e., the establishment of new friendships or the termination of existing friendships). In each simulation step, an actor (in our case, a single student) is selected randomly and given the chance to create, maintain, or terminate a friendship tie to another classmate. This decision is simulated based on various effects (independent variables) that are specified by the researchers to represent the rules of tie formation within the network. The effects can include actor attributes, dyadic attributes, and endogenous network processes. The first wave serves as a starting point for simulating the network processes that lead to the network observed during the second wave. SAOMs enable us to disentangle how the educational expectations of peers in a network influence the selection of friends and whether this applies independently of homophily principles and endogenous network processes such as transitivity (see below).

Actor characteristics can be added to the simulation process as additional dependent variables (in addition to social ties, which are always dependent variables). In this case, friendship ties and the attribute in question may both be changed during the simulations but in separate rounds. In our case, adolescents are allowed to change their educational expectations based on their attributes, their friendship ties, the characteristics of their friends, and the characteristics of their classroom social network. In this way, our models allow us to examine whether adolescents' educational expectations and those of their peers mattered when selecting coethnic and interethnic friends, and at the same time, we can analyze whether changes in educational expectations were due to the average educational expectations of those coethnic and interethnic friends.

Our data have a multilevel structure that is common among statistical analyses in educational research (1,992 students nested in 91 classrooms). We estimate joint models for the 91 single school classes by fitting *random-coefficient multilevel SOAMs* (Koskinen and Snijders, N.d.). These models use a Bayesian estimation technique and estimate joint parameters for the entire group of school class networks while taking between-network differences into account (see Ripley et al. 2021). The models allow researchers to assume that some parameters vary randomly among the school classes according to a multivariate normal distribution, whereas other parameters can be assumed to be fixed across the classes. Thus, this approach accounts for multilevel dynamics in a way similar to that in random-coefficient regression models.

For the simulations, we imputed missing values for both the dependent variables and covariates as described by Ripley et al. (2021: section 4.3.2).

### *Model Specification for Multilevel SAOMs*

Our social network analysis is based on two multilevel SAOMs. Model 1 tests whether Turkish-minority students prefer friends with higher educational expectations over friends with lower expectations and whether their friends influence their educational expectations. Model 2 allows us to distinguish whether these two processes differ between coethnic and interethnic friendships.

The *friendship* part of both models includes a selection of structural network effects. Among them are a reciprocity effect, three degree-related effects, a transitivity effect, and the interaction between transitivity and reciprocity. The outdegree effect expresses a student's tendency to nominate classmates as friends. Reciprocity refers to the inclination to reciprocate friendship ties. The transitivity effect accounts for the fact that people tend to befriend friends of friends. Indegree popularity and outdegree popularity test whether students form ties with actors in the network who are nominated as friends by many others and who nominate many others as friends, respectively. Outdegree activity captures whether students with many outgoing friendship nominations nominate more friends. Overall, these effects account for general endogenous mechanisms that affect the evolution of friendship networks (see Ripley et al. 2021).

To account for different dimensions of homophily, we add the following effects to the friendship part of our models: same educational expectations, same gender,



and similar HISEI (see Ripley et al. 2021). Additional variables help us to capture the coethnic or interethnic nature of adolescents' social relations. To this end, model 1 includes three same-ethnic-background effects, one for each ethnic group, namely, a "both majority," a "both Turkish-minority," and a "both other-minority" effect, with the reference category being all interethnic ties. To distinguish how coethnic and interethnic peers befriend each other and how coethnic and interethnic friends influence each other, model 2 includes dyadic effects instead, indicating the ethnicity of pairs of students (e.g., "majority-Turkish," "Turkish-Turkish," "Turkish-majority," etc.), whereas "majority-majority" forms the reference category.

In model 1, ego effects for the Turkish-minority and the other-minority groups additionally indicate whether students from these groups are more likely to nominate friends in comparison with majority-group students (who form the reference category). Alter effects for educational expectations capture whether those with higher expectations are more attractive as friends in general (see Ripley et al. 2021). Interactions between the ethnicity ego and the educational expectation alter variables (i.e.,  $Turkish_{ego} \times expectations_{alter}$  and  $other-minority_{ego} \times expectations_{alter}$ ) help us to understand whether Turkish-minority adolescents, in comparison with majority adolescents (and other-minority adolescents), are more likely to become and stay friends with peers who have higher educational expectations.

Model 2 follows a similar logic. Here, the dyadic effects "Turkish-majority," "Turkish-Turkish," and "Turkish-other minority" are interacted with the alter effect of educational expectations to determine whether coethnic (i.e., "Turkish-Turkish") and interethnic (i.e., "Turkish-majority" and "Turkish-other minority") friendships among Turkish-minority students are more or less likely when the alter has higher educational expectations.

The *educational expectations* part of our models allows us to investigate the social influence of friends (independent of the selection of friends) by using an effect called "average similarity," which tests whether adolescents adapt their educational expectations toward the average expectations of their friends (Ripley et al. 2021). In model 1, this effect is included in an interaction with the students' ethnic background. This follows from the aim of determining whether Turkish-minority adolescents are as susceptible to social influence as other adolescents. In model 2, the "average similarity" effect is weighted with the dyadic effects "Turkish-majority," "Turkish-Turkish," and "Turkish-other minority" to determine whether the social influence of friends on Turkish-minority students' educational expectations differs depending on whether the source of the influence is majority friends, Turkish-minority friends, or other-minority friends.

In both models, the students' gender, HISEI, scholastic performance, and GPA (within) serve as exogenous control variables. Dummy variables covering the students' ethnic backgrounds are added to control for group differences in the development of educational expectations.

Table A1 of the online supplement provides a full description of all effects.

We tested the convergence of our models, as described in Ripley et al. (2021: section 11.3.7).

**Table 1:** Educational expectations (%) in the analytic sample by ethnic background.

	Sample ( <i>N</i> = 1,992)	Ethnic majority ( <i>n</i> = 843)	Turkish minority ( <i>n</i> = 381)	Other minority ( <i>n</i> = 768)
<b>T<sub>1</sub></b>				
Lower secondary school	7.3	7.0	8.4	7.2
Intermediate secondary school	34.9	33.5	35.7	36.1
Upper secondary school	35.9	37.3	32.3	36.2
University	15.9	16.4	16.5	15.1
Missing	6.0	5.9	7.1	5.5
<b>T<sub>2</sub></b>				
Lower secondary school	6.5	5.7	8.1	6.6
Intermediate secondary school	29.3	28.0	31.2	29.7
Upper secondary school	31.6	31.3	28.4	33.5
University	22.5	24.8	20.5	21.1
Missing	10.1	10.2	11.8	9.1
<b>Change T<sub>1</sub> to T<sub>2</sub></b>				
-2	0.6	0.2	1.3	0.7
1	9.3	8.3	10.2	9.9
0	56.4	57.5	55.1	55.7
1	17.6	18.3	14.7	18.2
2	1.6	1.5	1.3	1.8
Missing information at T <sub>1</sub> and/or T <sub>2</sub>	14.6	14.1	17.3	13.7

Sources: CILS4EU, authors' calculations.

## Results

### *Descriptive Results*

Table 1 shows the educational expectations of adolescents from different ethnic groups over time. Of particular interest for our research question is the similarity in educational expectations between majority and Turkish-minority adolescents that can be seen even though the latter group had, on average, lower SES, performed worse in school, and more often attended the less demanding secondary school tracks, in which lower educational qualifications can be attained than in the higher tracks. This result indicates a pattern consistent with the aspiration-achievement paradox.

Table 2 shows that the friends of Turkish-minority adolescents had, on average, lower educational expectations than the friends of majority adolescents. Additionally, Turkish-minority adolescents' coethnic friends had higher educational expectations than their majority friends. Interestingly, the share of friends with the same level of educational expectations was lower among the Turkish group than among the majority group. This can be a result of differential selection processes, differential influence processes, or both.<sup>1</sup>

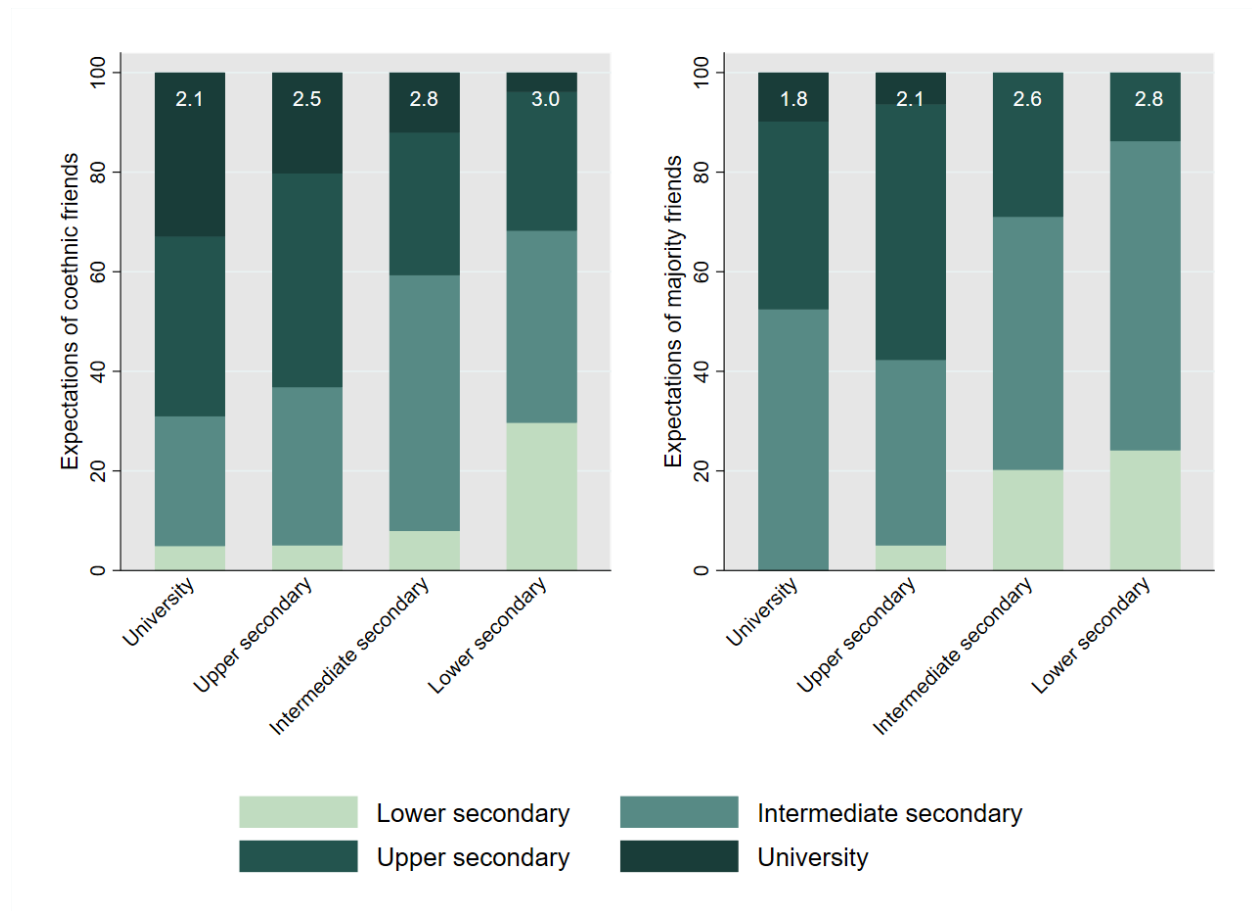
For Turkish-minority adolescents, Figure 1 combines information about their friends' educational expectations with information about the ethnic background of

**Table 2:** Composition of social networks concerning educational expectations and the ethnic background of friends.

	Sample ( <i>N</i> = 1,992)	Ethnic majority ( <i>n</i> = 843)	Turkish minority ( <i>n</i> = 381)	Other minority ( <i>n</i> = 768)
<i>Educational expectations of friends</i>				
Average educational expectations of friends, T <sub>1</sub>	2.7 (0.6)	2.7	2.6	2.6
Average educational expectations of friends, T <sub>2</sub>	2.8 (0.7)	2.9	2.7	2.8
Average educational expectations of majority friends, T <sub>1</sub>	2.6 (0.8)	2.7	2.4	2.6
Average educational expectations of majority friends, T <sub>2</sub>	2.9 (0.8)	2.9	2.7	2.8
Average educational expectations of Turkish-minority friends, T <sub>1</sub>	2.7 (0.8)	2.8	2.6	2.7
Average educational expectations of Turkish-minority friends, T <sub>2</sub>	2.8 (0.8)	3.0	2.7	2.8
Average educational expectations of other-minority friends, T <sub>1</sub>	2.7 (0.7)	2.7	2.6	2.6
Average educational expectations of other-minority friends, T <sub>2</sub>	2.8 (0.8)	2.9	2.7	2.8
Share of friends with the same educational expectations, T <sub>1</sub>	44.3%	45.8%	42.8%	43.4%
Share of friends with the same educational expectations, T <sub>2</sub>	43.3%	44.7%	38.9%	43.9%
<i>Ethnic background of friends</i>				
Share of majority friends, T <sub>1</sub>	42.2%	59.3%	13.7%	37.2%
Share of majority friends, T <sub>2</sub>	42.4%	60.1%	12.3%	37.4%
Share of Turkish-minority friends, T <sub>1</sub>	19.7%	6.6%	50.8%	18.9%
Share of Turkish-minority friends, T <sub>2</sub>	18.7%	5.0%	53.2%	17.0%
Share of other-minority friends, T <sub>1</sub>	38.1%	34.1%	35.5%	43.9%
Share of other-minority friends, T <sub>2</sub>	38.9%	34.9%	34.4%	45.6%

*Notes:* Values are means; values in parentheses are standard deviations. Sources: CILS4EU, authors' calculations.

these friends. It displays Turkish-minority adolescents' educational expectations and the share of their coethnic friends (left panel) and majority friends (right panel) with different expectation levels at T<sub>1</sub>. It appears as if the correspondence between the Turkish-minority adolescents' expectation levels and the average expectations of their friends was quite high when comparing friendships with coethnic peers and friendships with majority peers. Turkish-minority adolescents with higher expectations also had, on average, friends with higher expectations from both the majority and the Turkish-minority groups. This implies that Turkish-minority adolescents were initially not more similar to their coethnic friends (in terms of their educational expectations) than to their majority friends. It should be noted, however, that these aggregated outcomes do not account for possible group differences



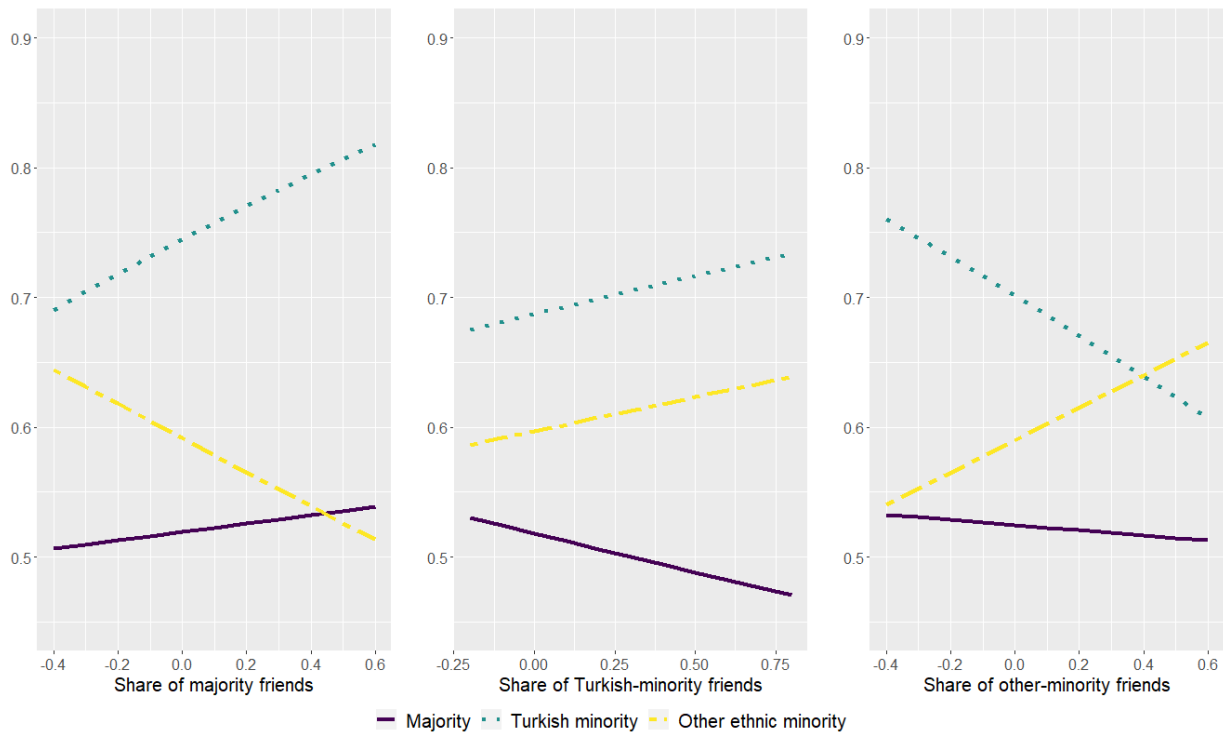
**Figure 1:** The relationships between Turkish-minority adolescents' educational expectations (categories on the x axis) and that of their coethnic friends (left panel) and majority friends (right panel). *Notes:* The white numbers within the bars indicate the average educational expectations of the particular subgroup of friends. Sources: CILS4EU, authors' calculations.

in opportunity structures. Differences might have existed, for example, in the opportunities to befriend majority peers (as opposed to coethnic peers) and in the opportunities to befriend co- and interethnic peers with certain levels of educational expectations.

Appendix B in the online supplement presents the descriptive statistics of the analyzed social networks and of the predictor variables within the analytic sample.

### *Results from the Multilevel Mixed-Effects Ordinal Logistic Regressions*

The results from the multilevel ordinal regressions confirm the existence of an aspiration–achievement paradox based on the German CILS4EU data (see Table C1 of the online supplement). In line with earlier studies (e.g., Salikutluk 2016), we find that after controlling for scholastic performance, HISEI, gender, and school



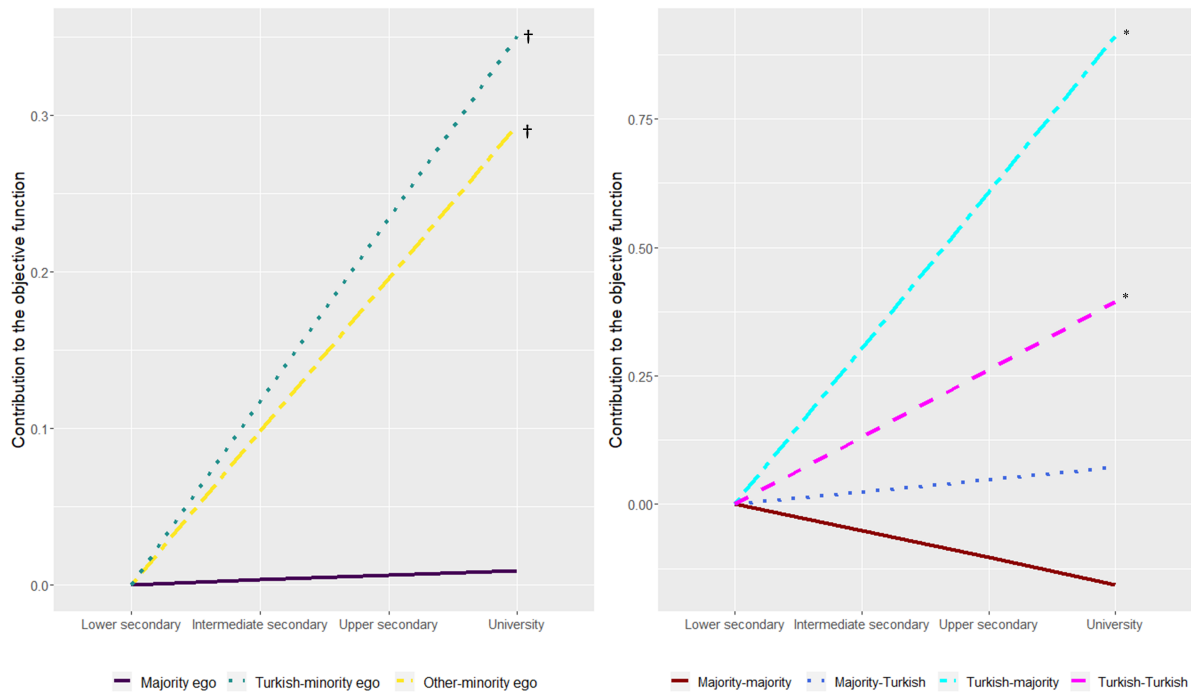
**Figure 2:** The effect of friends' ethnic background on educational expectations. *Notes:* Average marginal effects from multilevel mixed-effects ordinal logistic regressions (the full results are provided in Table C2 in Appendix C of the online supplement). Sources: CILS4EU, authors' calculations.

form attended, both Turkish-minority and other-minority adolescents had higher educational expectations than their majority-group counterparts.

More interesting for us, however, is the question of whether the share of coethnic friends (as opposed to the share of majority and other-minority friends) is associated with the development of Turkish-minority adolescents' educational expectations. Figure 2 reveals that an increasing share of majority friends is associated with higher educational expectations among Turkish-minority adolescents (see the green dotted line in the left panel of Figure 2). Similarly, the share of Turkish-minority friends is associated with higher educational expectations among Turkish-minority adolescents (see the green dotted line in the middle panel of Figure 2). Thus, having a higher share of either majority or coethnic friends was beneficial for Turkish-minority adolescents' educational expectations. Having a higher share of friends with other ethnic backgrounds, however, seems to have been detrimental (see the green dotted line in the right panel of Figure 2).

### *Results from the Random-Coefficient Multilevel SAOMs: Friendship Selection*

Figure 3 presents the results from the selection part of our two multilevel SAOMs, and it informs us about how Turkish-minority adolescents selected friends with



**Figure 3:** The moderating effects of ego's (left panel) and ego's and alter's (right panel) ethnic background on befriending peers with different educational expectations. *Notes:* SAOM results from model 1 (left panel) and model 2 (right panel) (the full results are provided in Appendix D of the online supplement). The stars and daggers indicate joint significance for the effect of alter's educational expectations: †  $p < 0.01$ ; \*  $p < 0.05$ . The models achieved sufficient convergence. Sources: CILS4EU, authors' calculations.

different levels of educational expectations. The left panel of Figure 3 presents the linear combinations calculated from the main effect of expectations<sub>alter</sub> and the interaction effects of expectations<sub>alter</sub> × Turkish<sub>ego</sub> and expectations<sub>alter</sub> × other-minority<sub>ego</sub>. These effects stem from the first SAOM (Table D1 of the online supplement provides the full results). The main effect is represented by the purple line and indicates the log odds of majority-group adolescents becoming and staying friends with classmates who have different levels of educational expectations. The increase in this likelihood with the increasing expectations of the alter is nonsignificant, meaning that majority-group adolescents did not prefer to befriend peers with higher educational expectations over those with lower expectations. As the greater steepness of the green (dotted) line indicates, however, such a tendency existed among Turkish-minority adolescents. The interaction effect expectations<sub>alter</sub> × Turkish<sub>ego</sub> is significant ( $\beta = 0.1, p \leq 0.05$ ), and testing for joint significance reveals that this adolescent group preferred friends with higher educational expectations over other friends ( $p \leq 0.01$ ).<sup>2</sup> A similar tendency can be found among other-minority-group members (see the yellow dot-dashed line). Thus, the attractiveness of befriending peers changed as a function of those peers' educational expectations among ethnic minority adolescents but not among their majority counterparts.



The right panel of Figure 3 displays the interactions between dyadic effects indicating the ethnicity of pairs of adolescents and the expectations<sub>alter</sub> effect. These results stem from our second SAOM (its results can be found in Table D2 of the online supplement). The slopes of the pink (dashed) and the turquoise (dot-dashed) lines reveal that Turkish-minority adolescents had a higher likelihood of befriending (and staying friends with) both majority-group peers and coethnic peers when those peers had higher educational expectations. Both interactions are significant ( $\beta = 0.4$ ,  $p \leq 0.01$  for the Turkish-majority dyads and  $\beta = 0.2$ ,  $p \leq 0.01$  for the Turkish-Turkish dyads), and testing for their joint significance reveals that educational expectations were a significant criterion for Turkish students' friendship choices in the cases of both co- and interethnic peers ( $p \leq 0.05$ ). We do not find evidence for such a preference among majority-group adolescents (see the blue-dotted and red lines). Other-minority-group members, in turn, preferred majority friends with higher educational expectations ( $p \leq 0.01$ ; see Table D2 of the online supplement).

### *Results from the Random-Coefficient Multilevel SAOMs: Social Influence of Friends*

Table 3 shows the effects estimated from the same two SAOMs, but this time, we focus on friends' social influence on adolescents' educational expectations. According to model 1, majority-group adolescents' educational expectations converged toward the average expectations of their friends over time ( $\beta = 1.3$ ,  $p \leq 0.01$ ). Insignificant interactions of this effect with the categories "Turkish-minority" and "other-minority" indicate that all three groups were similarly susceptible to such social influence.

Model 2 informs us of possible differences between co- and interethnic social influence. Both majority friends and other-minority friends exerted social influence on the majority adolescents' educational expectations. However, for the Turkish-minority group, we find that social influence was only statistically significant in the case of social ties to majority-group peers ( $\beta = 1.2$ ,  $p \leq 0.1$ ). In contrast, coethnic friends did not initiate statistically significant changes in Turkish-minority students' educational expectations, and the same was true for their other-minority friends.

### *Additional Analyses*

Previous research has documented that the role of peer socialization in the development of educational expectations matters more in comprehensive schooling systems than in ability-tracked systems (Buchmann and Dalton 2002; Lorenz et al. 2020). In comprehensive systems, the student body is more heterogeneous in terms of peers' educational expectations, thus providing greater opportunities for the emergence of social influence in this respect. In contrast, preselection due to ability tracking accounts for a large part of the expectations-related clustering within social networks in ability-tracked systems. Therefore, we seek to replicate our social influence results on a sample of 727 adolescents attending 35 classrooms in 21 *Gesamtschulen* (comprehensive schools), which are attended by students with a range of achievement levels and in which it is possible to attain different educational

**Table 3:** Ethnic variation in the social influence of friends estimated through multilevel SAOMs.

	Estimate	Model 1		Estimate	Model 2	
		Credible interval			Credible interval	
		From	To		From	To
<i>Ethnic background</i>						
Turkish minority (reference: majority)	0.27 <sup>†</sup> (0.17)	-0.06	0.60	0.24* (0.16)	-0.07	0.55
Other minority	0.11 (0.13)	-0.14	0.36	0.11 (0.13)	-0.13	0.35
<i>Social influence of friends</i>						
Average expectations of friends	1.27 <sup>†</sup> (0.45)	0.43	2.17	—		
<i>Interaction effects</i>						
Average expectations of friends × Turkish-minority	-0.12 (0.71)	-1.51	1.26	—		
Average expectations of friends × other minority	-0.19 (0.55)	-1.27	0.90	—		
<i>Social influence of friends among ...</i>						
Majority-majority dyads	—			0.53* (0.40)	-0.25	1.33
Majority-Turkish dyads	—			-0.34 (0.78)	-1.91	1.17
Majority-other dyads	—			0.95 <sup>†</sup> (0.39)	0.21	1.76
Turkish-majority dyads	—			1.20* (0.99)	-0.60	3.33
Turkish-Turkish dyads	—			0.54 (0.59)	-0.63	1.62
Turkish-other dyads	—			0.44 (0.64)	-0.81	1.70
Other-majority dyads	—			0.46 (0.46)	-0.40	1.41
Other-Turkish dyads	—			0.24 (0.54)	-0.82	1.31
Other-other dyads	—			0.61* (0.38)	-0.13	1.37

*Notes:* Values in parentheses are standard errors. Significance levels refer to the posterior probability of a parameter being positive or negative. <sup>†</sup>  $p < 0.05$ ; \*  $p < 0.1$ . For the full results of model 1, see Table D1, and for the full results of model 2, see Table D2, both of which can be found in the online supplement (Appendix D). Models achieved sufficient convergence.

qualifications; we expect to see more pronounced social influence effects in this subset of schools.

Using this sample, we replicate all of our results regarding ethnic variation in social selection and influence processes. As expected, the variation we find between the social influence of coethnic as opposed to interethnic friends among Turkish-

minority youth is even more pronounced in this restricted sample than in the full sample. In particular, we find significant social influence on Turkish-minority adolescents' educational expectations imposed by majority friends ( $\beta = 3.82, p \leq 0.01$ ) and other-minority friends ( $\beta = 2.09, p \leq 0.01$ ) as well as a nonsignificant effect of coethnic friends' average expectations ( $\beta = 0.32, p > 0.1$ ) (the full results are provided in Appendix E in the online supplement).

## Conclusion and Discussion

In this study, we assessed the link between the social and structural integration of ethnic minority adolescents by examining co- and interethnic friendship selection processes as well as the social influence of co- and interethnic friends on educational expectations within adolescent social networks. Based on multilevel regression methods, we showed that Turkish-minority adolescents in Germany had increasing educational expectations with increasing shares of both majority and coethnic friends in their social networks. The application of social network analysis techniques enabled us to disentangle the extent to which this pattern emerged from selection and influence processes. Our results revealed that Turkish-minority adolescents (as well as adolescents belonging to other minority groups) selected friends with high educational expectations, and this tendency was more pronounced than for majority adolescents. Among the Turkish-minority groups, this preference guided the selection of both coethnic and majority friends. We also found that over time, Turkish-minority adolescents changed their educational expectations in the direction of the average expectations of their friends, a tendency also found among majority-group and other-minority-group students. When separating the social influence of interethnic friends from the social influence of coethnic friends, however, we found that Turkish-minority students adapted their expectations only to those of their majority friends but not to those of their coethnic friends nor to those of their other-minority friends.

We draw three main conclusions from these results. First, social selection processes must not be considered only as accounting for the general similarity among social actors who are tied to each other but also as explaining the similarity within certain *social groups* of actors. In our case, Turkish-minority adolescents (and also other-minority adolescents) selected their friends differently than their majority-group counterparts did, which was reflected in a distinct preference for friends with high educational expectations among the former group. We found this preference to apply similarly to the selection of both co- and interethnic friends. This implies that Turkish-minority adolescents tend to establish both co- and interethnic social ties that offer access to social capital.

Second, the general susceptibility to the social influence of friends did not seem to vary among majority, Turkish-minority, and other-minority adolescents. This finding is in line with research from the United States (Cheng and Starks 2002). Future studies should test whether similar susceptibility to social influence among different ethnic groups also holds for other (educational and noneducational) outcomes and in other contexts.

Third, social influence among peers can vary depending on whether that influence is exerted by co- or interethnic friends. Peers who belong to the majority population seem to play a particularly important role in influencing Turkish-minority students. As proposed by social capital theory and various nuances of assimilation theory, it appears as if social ties to majority members provide nonredundant information that initiates changes in Turkish-minority adolescents' educational outcomes. In contrast, the educational expectations of Turkish-minority adolescents' coethnic friends were not associated with changes in Turkish adolescents' own expectations. This evidence of the differential social influence of co- and interethnic peers is a novel contribution, at least for adolescence, during which peer socialization plays a vital role.

Our descriptive results indicate that the initial similarity in the educational expectations of Turkish-minority adolescents to those of their coethnic friends cannot fully explain why we found no coethnic social influence on members of this group. Rather, the mechanisms underlying co- and interethnic social influence seem to vary. Future studies should investigate these mechanisms. In addition to the explanation in terms of bridging social capital, a possible alternative explanation might be that groups whose members are more central within social networks are more powerful sources of social influence (see Ellis and Zarbatany 2007). Such groups, because of their members being closely knit together, might have more opportunities to control the behavior of their peers and, thus, effectively enforce social norms. This might have been a reason why Turkish-minority adolescents, who are a numerical minority in most classrooms, exerted no social influence on their coethnic friends. Additional results from auxiliary SAOMs presented in the online supplement (Appendix F) seem to confirm this assumption: the social influence of Turkish-minority adolescents' coethnic friends became increasingly important with increasing shares of Turkish-minority students in the classroom. This is in line with a study showing that increasing shares of coethnic peers lead to stronger peer effects among ethnic minority students (De Hoon and Van Tubergen 2014).

In theoretical terms, these results highlight the value of bridging social capital as provided by ethnic minority members' social ties to majority-group members (see Kanas et al. 2012). Such ties seem to provide access to resources that are beneficial for ethnic minority adolescents' educational outcomes. Given that Turkish-minority adolescents had higher educational expectations with increasing shares of majority friends and that such expectations—because of their role in determining educational attainment (Morgan 2005)—are a key structural outcome, it can be concluded that social integration enhances structural integration. Regarding the aspiration–achievement paradox, it appears as if the social influence exerted by majority-group members stabilizes this phenomenon. Regarding theories on assimilation, our results imply that ethnic minority members tend to adapt their beliefs toward those held by members of the majority population and not toward those held by their in-group peers. This would confirm the view of assimilation as a process of fusion and the possibility for ethnic minority members to become part of the majority in the long run. At the same time, we found no evidence to confirm a key hypothesis drawn from segmented assimilation theory, according to which coethnic

friends help Turkish-minority youth maintain or even increase their educational expectations. It should be noted, however, that having coethnic friends did not lower Turkish-minority adolescents' educational expectations.

Our study has some limitations. Our results refer to a particular outcome—educational expectations. Although it might be worthwhile to examine grades and test scores in future studies, we chose this outcome for two main reasons. First, educational expectations predict educational attainment. Second, such expectations are comparatively higher among some ethnic minority groups than among the majority group, which offers the possibility that peer processes such as those proposed by segmented assimilation theory may be in operation—although this does not seem to be the case in our data. Our study opens avenues for future research that might seek to replicate our results for different educational outcomes, such as grades and test scores, as well as for noneducational outcomes.

Furthermore, we focused on the Turkish-minority group in Germany and compared the processes among members of this group with those among majority-group members as well as a rather diverse group consisting of ethnic minority members from a variety of other backgrounds. Although this might appear to be arbitrary, this decision was conceptually grounded. For the Turkish-minority group, the aspiration–achievement paradox is well described (e.g., Salikutluk 2016), and it could be replicated with our data. Unfortunately, it was not possible to identify any additional ethnic minority group that was large enough (in terms of case numbers) to be compared with the majority and the Turkish-minority groups. Therefore, we leave it to future research to test whether our results can be generalized to other ethnic minority groups and contexts.

Overall, our study contributes significantly to the understanding of social selection and social influence effects in the context of ethnic educational inequality and, on a more general level, the link between the social and structural integration of ethnic minority members. Our results reveal that peer processes are not uniform but vary depending on the type of social ties under examination. We hope that this conclusion stimulates further research on the role of social networks in the reproduction of different types of structural inequality.

### *Research Ethics*

We hereby affirm that all research on human subjects has been performed in a way that is consistent with the ethical standards articulated in the 1964 Declaration of Helsinki, its subsequent amendments, and Section 12 (“Informed Consent”) of the ASA’s Code of Ethics.

### Notes

- 1 Additionally, Table 2 indicates a considerable amount of ethnic clustering within the friendship networks. Within the majority group, 60 percent of friends belonged to the majority group; for the Turkish students, the share of friends with the same ethnic background was 51 percent and 53 percent at T<sub>1</sub> and T<sub>2</sub>, respectively.

2 To identify the significance of the linear combinations, we calculated the Mahalanobis distance of an element of the posterior sample from the posterior mean for linear combinations of multiple effects. The  $p$  values achieved from this procedure reflect the relative frequency with which the calculated distances are greater than the distance between the tested value and the posterior mean.

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