

Co-ethnic peer effects on educational expectations

Does ethnicity and ethnic identity of peers moderate the immigrant advantage in educational expectations?

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Abstract

This paper explores whether the embeddedness of immigrant-origin students in same-ethnic peer networks moderates their advantage in educational expectations vis-à-vis natives. Some scholars consider that co-ethnic networks are a source of social capital in the form of mutual support, access to resources and achievement-oriented norms and values. By means of sharing a same ethnic identity, individuals are more likely to develop friendship ties and to see each other as members of the same in-group, which may ease access to network social capital and to boost interpersonal influences. Other scholars, however, consider that embeddedness in co-ethnic networks is a detrimental condition that could hamper the development of ambitious educational expectations and access to non-redundant information that is easier to access in heterogeneous peer networks. To shed light on this debate, this paper resorts to the German sample of the Children of Immigrants Longitudinal Survey in Four European Countries (CILS4EU), a survey that allows to measure directly friendship ties in the classroom thanks to a sociometric questionnaire and, therefore, to capture peer effects properly. The paper explores, first, whether the share of same-ethnic friends (objectively defined using the country of origin) moderate the immigrant advantage in university expectations and, second, whether the alignment of ego and friends' subjective ethnic identity reinforces the effect of same-ethnic friends.

Introduction

Studies have repeatedly found that immigrant-origin students in several European and North American countries tend to hold more ambitious educational plans than natives and are more likely to attend academically oriented educational pathways than vocational ones (e.g. Heath & Rothson, 2014), once social background and academic performance are controlled for. This regularity has also been identified for ethnic minorities compared to majority groups (e.g. Fernández-Reino, 2016). This phenomenon is labelled “immigrant advantage” (Feliciano & Lanuza, 2016), “ethnic-choice effects” (Tjaden & Scharenberg, 2016) or “secondary effects of an immigrant background”.

Researchers have attributed a predominant role to educational aspirations and expectations in the development of the educational career and in educational attainment, especially since the formulation of the Wisconsin status attainment model in the 1960s/1970s (Sewell et al., 1969). Indeed, educational expectations are considered by some researchers as the “fundamental blocks over which future behavioural choices are made” (Portes & Rumbaut, 2001: 215) and they are positively associated with later educational choices and educational attainment (e.g. Bozick et al., 2010). This gives credit to the consideration of educational expectations as anticipated educational decisions (Valdés, 2020), which reflect realistic educational plans that internalize the constraints that individuals face in the educational decision-making process.

Individuals are embedded in social networks, sets of actors that are connected by sets of relations (DiMaggio & Garip, 2012). A set of stable and regular relations between individuals constitute a social structure that guides individual action by promoting certain behaviours and discouraging others, and by providing access to resources that enable the pursuit of an individual’s aims. The shaping of individual behaviour by social relations is what Granovetter called the “problem of embeddedness” (Granovetter, 1985). Acknowledging that individual action is embedded in social relations and shaped by them implies focusing on how significant others and the social environment influence individuals’ purposive actions and outcomes.

In the study of how the social environment shapes educational outcomes, one relevant category of “significant others” are school peers, especially school friends. Adolescents spend much time in school and peers are assumed to exert influence through social educational norms within the close social network, the provision of information, mutual assistance and the definition of role models and frames of reference that shape students’ values, wishes and expectations (Roth, 2017, p. 68). Peer influence exists whenever individual behaviour is affected by social interactions that are not constrained by pre-assigned roles and interactions (Leifer, 1988 in Lomi et al., 2011). Furthermore, the composition of the friends’ network in terms of ethnic background and subjective ethnic identity might be relevant to understand the expectations advantage of immigrant-origin students vis-à-vis non-migrant background students. Several scholars have emphasised the importance of ethnic social networks in the provision of support and access to resources to facilitate the incorporation of immigrants and their descendants in destination societies and to overcome integration barriers (Bankston III, 2014; Portes & Rumbaut, 2001; Zhou, 2005; Zhou & Bankston III, 1994). However, others, from an assimilationist

perspective, have warned about the potential negative effect of ethnic embeddedness for immigrant incorporation (cf. Schulz, 2013).

Either positive or negative, ethnic homophily (i.e. individuals are more likely to develop ties with same-ethnic than with interethnic individuals) is one of the most relevant dimensions along which networks are segregated in diverse societies (McPherson et al., 2001, pp. 420-422). However, ethnic homophily in friendship relations is not ubiquitous, but comprises mainly same-ethnic peers who share a similarly strong subjective ethnic identity (Leszczensky & Pink, 2019). Therefore, both the “objective” and “subjective” ethnicity of peers might be relevant to understand the strength of interpersonal influences on the immigrant advantage in educational expectations, since a shared identity increases the perception of being part of the same group as others, facilitating in-group solidarity, mutual understanding and support and increasing the willingness to share resources with other in-group members (Kramer, 2009; Portes & Sensenbrenner, 1993; Schulz et al., 2017; Zhou & Bankston III, 1994). However, in studies of same-ethnic peer effects, ethnicity has been mostly considered as an objective category, resorting to country of origin to measure it, neglecting the potential role of perceived identity as a factor that strengthens peer effects.

Research on immigrant and minority peer effects in school has mostly relied on classroom or school aggregates of the individual characteristics of students (e.g., Brandén et al., 2016; Hermansen & Birkelund, 2015), but rarely on actual ties between individuals and the characteristics of those with whom they actually interact. However, recent studies show that actual classroom and school friends have an independent effect on educational outcomes (expectations, cognitive ability) beyond classroom or school characteristics (Dollmann & Rudolphi, 2020; Raabe & Wölfer, 2019). Friends constitute a more relevant reference group than ordinary classmates because ties among the former are stronger and interactions are more frequent, leading to more opportunities for social contact and influence. Another gap in the literature on immigrant peer effects is that many studies focus on test scores and school grades and not so much on other outcomes, like tracking or educational expectations, so that we do not know so much about whether the effect is the same for these understudied outcomes.

This paper aims at filling these gaps by analysing longitudinally whether the share of same-ethnic best friends in the classroom contributes to the immigrant advantage in educational expectations and whether sharing a subjective ethnic identity with them moderates the potential effect of same-ethnic friends when ethnicity is measured “objectively” using the country of origin. I resort to data for Germany from waves 1 and 2 of the Children of Immigrants Longitudinal Survey in Four Countries (CILS4EU) (Kalter et al, 2016a; Kalter et al, 2016b) which enables me to directly measure friendship ties in the classroom thanks to a sociometric questionnaire. Moreover, since respondents who filled in the sociometric questionnaire also answered the main questionnaire, the information on peers is available directly from their own answers.

The paper is organised as follows. First, I review the results of previous investigations that have analysed the effect of co-ethnic peers, immigrants’ concentration, ethnic segregation and ethnic diversity in the school or classroom on the educational outcomes of native and immigrant-origin students. Second, I review the literature on positive and

negative effects of ethnic embeddedness on the educational outcomes of immigrant origin students, focusing on the proposed mechanisms through which co-ethnic peers and ethnic networks, more generally, have an effect on the educational expectations of immigrant-origin adolescents. Third, I present arguments about the moderating effect of subjective ethnic identity on co-ethnic peer effects on the immigrant advantage in expectations. Fourth, I present the research design, followed by the results. Finally, the latter are discussed and conclusions are formulated.

Theory and literature review

The embeddedness of individuals in co-ethnic networks has been considered by several scholars as a relevant factor affecting the prospects of structural integration of immigrants and their children in the host society. Education has received special attention among the domains of integration. The literature suggests both positive and negative effects of ethnic embeddedness on immigrants' educational outcomes. Furthermore, there are scholars that consider positive or negative effects to be conditional on additional features of ethnic networks.

Positive effect of co-ethnic peers on educational expectations

To start with, segmented assimilation theory (Portes & Rumbaut, 2001; Zhou & Portes, 1993) argues that co-ethnic networks are a source of support that helps immigrants to confront the challenges of adaptation to the host society and to cushion initial shocks. Membership in a co-ethnic network makes easier to access resources that are embedded in those networks and their eventual mobilisation for the pursuit of an individuals' aims easier than otherwise, thus compensating for the lack of individual or family resources (Zhou & Bankston III, 1994).

Firstly, social norms and values oriented to educational achievement in the peer group that create an achievement-oriented environment work as a framework of reference which guides individual behaviour through social influence (Haller & Portes, 1973; Coleman, 1988; Kao, 2004; Roth, 2013). The achievement-oriented environment stems from the clustering of co-ethnic minority peers, usually from immigrant origins, who tend to have comparatively higher educational aspirations and expectations than majority/native peers and, in some countries (e.g. Germany), higher achievement motivation and higher levels of school engagement (OECD, 2018). Several authors have attributed these achievement-oriented norms to the structural position of minorities in society, to ethnic-specific forms of cultural capital, to common histories of migration or to the interaction of some of these factors (Gibson, 1988; Zhou & Bankston, 1994; Shah et al, 2010; Schulz, 2013). If immigrant and minority students tend to have better dispositions towards education and the latter are related to specific characteristics of the ethnic group (e.g., a similar migration experience, a shared cultural background), being surrounded by a co-ethnic environment might, through social contagion and social control, increase and/or reinforce the educational expectations of immigrant-origin students vis-à-vis natives (Lorenz, et al., 2021; Zhou & Bankston, 1994; cf. also Seuring, Rjosk & Stanat, 2021). In this line, ethnic embeddedness could also prevent immigrants from contact with disadvantaged groups in

the host society espousing values that are detrimental to educational attainment (“disadvantaged countercultures”) (Portes & Rumbaut, 2001).

Secondly, ethnic social networks provide several forms of tangible educational support to their members that might *sustain or help to develop* ambitious educational expectations. Friendship relations among co-ethnics, as compared to inter-ethnic friendship relations, have characteristics that might facilitate the provision of that support. For instance, higher likelihood of sharing educationally relevant resources due to the stronger ties between co-ethnics than between cross-ethnic individuals (Seuring, Rjosk & Stanat, 2021; Veerman & Dronkers, 2015). These educationally relevant resources could be learning support in the form of helping each other with homework or spending time studying together. This (could) create a peer environment that helps to develop or to maintain high educational expectations. Some studies find that the content and quality of friendship relations among same-ethnic peers are in part different from friendship relations among interethnic peers. Kao and Joyner (2004) found that adolescents in the US tended to share more activities and to do so more often with same-ethnic/race friends than with cross-race/ethnic ones, even in the case of best friends, which, according to authors, signal that same-ethnic friendships tend to be closer and more intimate. In this line, Aboud, Mendelson & Purdy (2003) found in a small one-school Canadian sample that adolescents rated same-race friendships slightly higher in intimacy than cross-race friendships, although they found no differences in reliable alliance, help and emotional security. Another study by Schneider, Dixon & Uvari (2007) found that co-ethnic friendships are more stable than inter-ethnic friendships among junior high school students in two Canadian cities and that the former are rated higher in positive quality and slightly lower in conflict or hostile competition. Another form of educationally meaningful support could be access to a network of ethnic institutions that provide educational support beyond official schooling (supplementary education) that both diffuses positive achievement norms within a group and provide the means to sustain them, as ethnographic work has shown regarding the Chinese-, Korean- and Vietnamese-origin immigrant communities in the United States (Kim & Zhou, 2006; Zhou & Bankston, 1994).

Thirdly, co-ethnic peers can provide immigrants with protection from external (host society) discrimination and isolation, thus minimising negative experiences, and creating a welcoming environment that would strengthen the strive for educational achievement (Schulz, 2013; Portes & Rumbaut, 2001). Based on social comparison theory, Wicht (2016) argues that, in environments with more same-ethnic peers, students would develop more ethnic ties and solidarity, feel less discriminatory experiences and identify more strongly with the prevailing school climate. This would influence in a positive way the educational expectations of immigrant-origin students (cf. Fekjaer & Birkelund (2007) for a similar argument). This expectation assumes that a peer environment with more immigrants —as compared to one with more natives— is characterised by higher aspirations. Wong et al (2003) found that having a stronger connection with the ethnic group (focusing on African Americans in the United States) is associated with a less acute decrease in school grades as the subjective perception of being discriminated against increased, as well as with smaller increases in problem behaviour. This gives credit to the

claim that ethnic embeddedness helps to confront the psychologically detrimental consequences of discrimination. Notwithstanding, as it will be explained below, there are theoretical arguments that state that protection from a discriminatory environment could have a negative effect on the immigrant advantage in expectations. In a similar vein, Fekjaer & Birkelund (2007) argue that interaction with many same-ethnic peers would create the feeling of not being a token, that is, the single representative of a minority group in a majority-dominated context that feels the responsibility of behaving in a certain way on behalf of his/her group. Being simply considered as another one among many would ease performance pressure and role entrapment, creating favourable conditions for good academic performance and, in turn, high educational expectations. These considerations lead me to formulate the following hypothesis:

Hypothesis 1a (H1a): *the more intense ethnic embeddedness is (co-ethnic peer effects), the greater the immigrant advantage in educational expectations vis-à-vis natives (net of academic ability and socioeconomic status).*

Negative effects of co-ethnic peers on educational expectations

The debate about the potential effects of co-ethnic peers on educational outcomes has also put forward arguments for the negative impact of ethnic embeddedness. These arguments deal mainly with the consequences of not having bridging ties (ties with people who are different from oneself) which enable access to social capital that might be absent in the ethnic network.

Firstly, heterogeneity in the characteristics of members of a social network allows access and exposure to a more heterogeneous variety of resources and influences than in homogeneous networks, according to Lin's (2001) theory of social capital. For example, newer, richer or more varied information about the education system in terms of procedures, structure of the education system, or access to vocational training positions could be accessed if one interacts with less co-ethnics and with more members of outgroups (Schulz, 2013). Wölfer et al. (2019) argue that, for immigrants, contact with members of the outgroup (i.e., natives), facilitates academic achievement through supportive information and unique resources. Despite not being able to test the mechanisms, they find that more outgroup contact is associated with better school grades for immigrants. Lorenz et al. (2021) similarly find that a higher share of ethnic majority members among the best friends of Turkish minority students in Germany is associated with higher educational expectations among the latter, whereas co-ethnic friends do not exert any influence on expectations. They conclude that this is evidence of the benefits of bridging social capital and of the boosting effect of ties with the majority. Both Wölfer et al (2019) and Lorenz et al. (2021) mention heterogeneous information as one of the relevant resources that can be accessed through bridging ties. However, the information argument is treated in an ambivalent way in the literature since some researchers claim that lacking or inaccurate information would contribute to the higher expectations among immigrants by leaving unaltered the overoptimistic beliefs about academic education. Another relevant resource achievable through bridging ties, especially ties with natives, is exposure to and acquisition of the host country language, which favours school

performance and, indirectly, educational expectations. This resource is less easily accessible in environments made up mainly of ethnic minorities (Seuring et al, 2021).

Secondly, ethnic embeddedness could be detrimental for the educational expectations of immigrant-origin students if it alleviated the desire to overcompensate through education the perception or experience of discrimination (Wicht, 2016). Based on the assumption that immigrant-origin students make larger investments in education than natives to get better skills and qualifications to overcome more easily labour market discrimination, ethnic embeddedness, would work as a protective device isolating immigrants from the threat of discrimination by the wider society and helping them to cope with its negative effects, but also lessening the need for overcompensation through education, since being surrounded by such an environment would make that threat less evident (Wicht, 2016). The expected negative effect of ethnic embeddedness is additionally based upon the frame of reference of individuals. Those immigrants from an ethnic group whose frame of reference is mainly characterised by the desire of socioeconomic advancement and upward mobility would be the ones negatively affected by stronger levels of co-ethnic embeddedness (Wicht, 2016). In line with this explanation, Wicht (2016) finds that, in German schools with a larger share of immigrants, the occupational aspirations of Turkish-origin students are lower, whereas the opposite happens to students whose own or family origins are in Former Soviet Union countries, whose outlook is not defined so strongly by the desire of upward social mobility.

Thirdly, ethnic embeddedness could be the result of an ethnic segregation process stemming from a reactive ethnicity linked to an oppositional culture that challenges the mainstream educational institutions, goals and pathways to achieve them (Fordham & Ogbu, 1986; Ogbu & Simmons, 1998). A negative effect of ethnic embeddedness could signal ethnic marginalisation and the adoption of anti-school norms in the peer group. These would negatively influence the educational expectations of an individual through the assumption of the aforementioned anti-school norms or through the psychological stress and affective dissonance caused by the potential sanctioning of co-ethnic peers for showing an academically oriented behaviour that is identified with the majority group in the society and the uncertainty about whether academic striving would pay off in terms of eventual acceptance by the latter (Fordham & Ogbu, 1986).

The rejection-(dis)identification model (RIM) describes a phenomenon by which individuals who suffer rejection by the dominant ethnic group because of their minority status strengthen minority group identification as way to cope with prejudice and to alleviate its negative effects on well-being. Simultaneously, rejection towards the dominant group increases, making them more prone to distancing from it (Branscombe et al., 1999; Mazzoni et al, 2019). A step forward in this process is the development of a reactive ethnicity that is built in opposition to the norms, rules, behaviours, etc. that the “dominant group” is perceived to espouse, and which are perceived to be the mainstream in the society, tying the reactive ethnicity to an oppositional culture that, as far as this work is concerned, would imply the development of anti-school norms, the rejection of high educational achievement as a desirable aim and of its positive effects on socioeconomic advancement (Fordham & Ogbu, 1986; Lorenz et al., 2021; Çelik, 2015). In brief, academic learning would be rejected because that would mean acting like the

majority or “acting white” as Fordham and Ogbu (1986) referred to in their cultural-ecological theory of school performance to explain Blacks underachievement in the United States. These authors defined the oppositional culture frame of reference of subordinate minorities as “certain forms of behaviour and certain activities or events, symbols, and meanings as not appropriate for them” because they are perceived as characteristic of the majority group while at the same time those minorities emphasise others that “are more appropriate for them because they are not part” of the majority group (Fordham & Ogbu, 1986: 181). The development of an oppositional culture is linked to minorities’ attitudes and behaviours toward schooling through the interpretation of schooling as “learning the white American [i.e. majority dominant group] cultural frame of reference which they have come to have adverse effects on their own cultural and identity integrity” (Fordham & Ogbu, 1986: 183). Social contagion effects occur because co-ethnic peer groups discourage and sanction academic effort and individuals fear those peer responses and the dissonance stemming from the perceived contradiction between academically oriented behaviour and their collective identity (Fordham & Ogbu, 1986).

Oppositional culture theory was developed to explain the underachievement of Black students in the US, considered a caste-like an involuntary minority, compared to Whites and other minorities (Fordham & Ogbu, 1986; Ogbu & Simmons, 1998). However, its applicability to the educational outcomes of immigrant-origin students in European countries, in general, and Germany, in particular, seems questionable. Despite having poorer grades and attaining lower educational qualifications than natives (in gross terms), immigrant-origin students tend to hold more ambitious educational aspirations and expectations than natives and to be tracked more often to academic pathways than to vocational pathways than the latter. In Germany, immigrant-origin students from several origins seem to hold, at least, the same educational expectations and aspirations as natives. Moreover, Turkish-origin youth, who belong to the most socioeconomically disadvantaged minority in Germany, seem to be ones to hold higher average educational expectations (Salikutluk, 2016; Tjaden & Hunkler, 2016; Lorenz et al., 2021). In addition, the desire for upward mobility seems to contribute to explain them (Salikutluk, 2016). Furthermore, the only large-scale study, to my knowledge, which analyses whether an oppositional culture exists among Turkish-origin youth in Germany and whether it influences friendship selection, concludes that it does not (Lorenz, Boda & Salikutluk, 2021).

Fourth, ethnic embeddedness could also be the reflection of the concentration of deprivation and disadvantage at the school or neighbourhood levels that result from socioeconomic segregation. In many countries, the immigrant-origin population has lower socioeconomic status than the native population and ethnic concentration goes hand in hand with socioeconomic disadvantage both for the already mentioned reason and also potentially due to the fact that non-migrants fly away from or avoid schools attended by many immigrant-origin students. Socioeconomic disadvantage at the individual level is negatively associated with educational expectations and the concentration of socioeconomic disadvantage could reinforce this association and, indirectly, undermine the educational expectations of immigrant-origin students (cf. Borgna & Contini, 2014 for a discussion on the association between residential and school segregation and migrant

achievement penalties). In an environment characterised by strong deprivation, the latter may block any positive effect created by immigrant optimism because the immigrant community may not be able to “muster the minimum material and social resources to foster the economic progress of their own members, much less provide for the economic success of their offspring” (Portes & Hao, 2004: 11927). Borgna and Contini (2014) find that migrants’ relative underachievement is larger in countries where immigrants have a larger risk of attending schools that enrol very low achieving pupils (marginalised schools).

Fifth, classic assimilation theory describes assimilation as a unidirectional process through which immigrants progressively resemble members of the majority or ‘core’ ethnic group of the receiving society and, at the same time, get rid of their distinctive traits as ethnic minorities until they become virtually indistinguishable from the former. The process of assimilation goes through different stages. Initially, it entails involvement in social relations and core institutions of the host country with members of the majority group and, at the same time, breaking strong ties with members of the in-group. The successful accomplishment of the first stage of the assimilation process is necessary for the unfolding of the subsequent ones, which involve assimilation in additional domains (marital, identity, prejudice, etc.) and, finally, the blurring of most distinctive traits of immigrants and their descendants (Alba & Nee, 1997, 2003; Gordon, 1964). Therefore, ethnic embeddedness would indicate an inadequate or unfinished integration process that would undermine their educational achievement, prospects for educational success and structural integration of immigrant-origin youth. This would apply especially to second- and earlier-generation immigrants, since they would have had more chances to be exposed to host country influences than later generations. It would also prevent them from accessing a wider range of resources and influences as compared to a situation in which they were less intensely embedded in co-ethnic networks and had more ties with outgroups, especially the natives/majority.

Other alleged reasons why ethnic embeddedness would be detrimental for educational outcomes of immigrants and, conversely, outgroup/intergroup contact would be beneficial for educational outcomes, are lower school engagement, belonging and feelings of acceptance (Wölfer et al., 2019; Baysu, Phalet & Brown, 2013). An additional reason why ethnic embeddedness could be detrimental for expectations is the excessive normative pressure exerted by the co-ethnic peer environment, which could lead to rejection of the achievement-oriented values that characterise the ethnic group.

These considerations lead to formulate the following hypothesis:

Hypothesis 1b (H1b): *the more intense ethnic embeddedness is (co-ethnic peer effects), the narrower the immigrant advantage in educational expectations vis-à-vis natives (net of academic ability and social origins).*

Further considerations

Ethnic minority populations in European countries often originate from migration flows. This entails that individuals from ethnic minorities tend to have a migration background so that minority and migrant background overlap. As a result, a co-ethnic network could

be at the same time a network made up of people with immigrant origins. This has an implication for the study of co-ethnic peer effects: they might be hiding the effect of having immigrant origins and this could be the source of the advantage, rather than sharing an ethnic background with peers. That is, co-ethnic peer effects could be spurious. One should rather talk about immigrant peer effects. In fact, in the literature, the effect of immigrant-origin peers is often explained resorting to similar causal mechanisms as the effect of (co)ethnic peers. Moreover, the immigrant background of peers may still have an independent effect that reflects that immigrant-origin peers may have experienced themselves or have been exposed, through their parents or relatives, to similar experiences and narratives related to migration that tie them together and boost the individual effect of an immigrant background on educational expectations. Even if ego and its peers belong to different ethnic groups. Therefore, the key element would be that ego and peers have both immigrant origins. For instance, immigrant optimism (i.e., immigrant-origin youth strive in education with the aim of improving socioeconomically so as to achieve the goal of improving their life chances that motivated the migration of their parents) is one of the explanations provided in the literature. The confluence of immigrant-origin adolescents with high educational expectations in the peer group could create an achievement-oriented framework of reference, regardless of whether they are co-ethnic or not (e.g., Kao, 2004), producing “positive spillover effects on school motivation and educational choices of their peers” (Hermansen & Birkelund, 2015: 617). Additional arguments have been suggested for both an expected positive and an expected negative effect of a peer environment in school made up mainly of immigrant-origin students. On the one hand, the concentration of immigrant students could contribute to create an environment with which immigrant-origin students identify, making the school environment more welcoming and (Birkelund & Fekjaer, 2007; Hermansen & Birkelund, 2015). On the other hand, the concentration of immigrants could create a poorly performing peer environment that results from their comparatively poorer performance, which may delay the academic progress of all the students in the classroom and depress their educational expectations (Hermansen & Birkelund, 2015; Schneeweis, 2015). Based on the previous considerations, I formulate the following hypotheses:

Hypothesis 2 (H2): *the effect of ethnic embeddedness on the immigrant advantage in educational expectations vis-à-vis natives (net of academic ability and socioeconomic status) is partly explained by the percentage of best friends with an immigrant origin.*

Hypothesis 3a (H3a): *a larger percentage of immigrant-origin friends increases the immigrant advantage in educational expectations vis-à-vis natives (net of academic ability and socioeconomic status).*

Hypothesis 3b (H3b): *a larger percentage of immigrant-origin friends decreases the immigrant advantage in educational expectations vis-à-vis natives (net of academic ability and socioeconomic status).*

Besides the positive or negative effect of co-ethnic peers, several authors have warned about the conditional effect of ethnic embeddedness depending on the compositional characteristics of immigrant and ethnic groups (Schulz, 2013), such as the educational background of peers or their occupational background. Portes and Rumbaut (2001) stated that ethnic communities can provide support “within the limits of their own information and resources”, defined by the occupational composition of their members. Borjas (1992) used the term “ethnic capital” to refer the educational attainment in the ethnic community: the higher the educational attainment among parents in the ethnic community, the better the resources available to their children and the better their own attainment. The distinction made by Zhou (2005) between ethnic enclave and ghetto is also relevant in this respect. Enclaves are occupationally and socioeconomically diverse, have a wide variety of social and community-based organisations and a diversified economy that enable interpersonal ties to cut across class boundaries and help to connect with the mainstream society, thus providing bonding and bridging ties. On the contrary, in ghettos, social relations are constrained by the low socioeconomic status of their members, there is not a community life and bridging ties are scarce.

Subjective ethnic identity and the reinforcement of “objectively” co-ethnic peer effects

Many arguments about how same-ethnic peers influence ego’s educational expectations rely on the assumption that sharing ethnicity leads to increased interactions and exchange through mutual recognition. A *consciously* shared ethnic identity is what allows objectively co-ethnic peers to mutually recognise each other as members of a common group, thus being the link between an “objective” ethnic origin and actual peer influence. However, ethnicity is treated in most studies on ethnic peer effects as a seemingly objective category and operationalised likewise, usually resorting to the country of origin of respondents. This misses the subjective component of ethnicity, that is, the subjective feeling of being member of a group (cf. Lesczensky & Pink (2019) for a discussion on this issue). However, if sharing an ethnic background is what causes peers to have a differential effect on ego, then how an ego and peers feel subjectively about their ethnic identity might be relevant for the strength of interpersonal effects. In the same way as ethnic homophily in friendship does not exist equally strongly among all members of an ethnic group but depends on the strength of ethnic identification (Lesczensky & Pink, 2019), the *subjective* ethnic identity of *objectively* same-ethnic peers might also play a role in the strength of peer effects. That is, the *subjective ethnicity of friends* may moderate the effect of their *objective ethnicity* on ego’s educational expectations.

Social identity theory (Tajfel & Turner, 1979) conceptualises a group as “a collection of individuals who perceive themselves to be members of the same social category” and “share some social involvement in the common definition of themselves” (p. 40) that orients their behaviour based on their identification with that social category. Social categorisation is a cognitive tool that provides a framework for self-reference and creates and defines the place of an individual in society. This defines the individual as similar or different from members of other groups, thus constituting a social identity. Social identity

theory assumes that individuals strive to enhance their self-esteem and that the latter is tied to the standing in society of the in-group that furnishes them their social identity. For this to occur, the individual must have internalised group membership as an aspect of self-concept. If this is the case, an ego might be more sensitive to the influence of those peers with whom it shares a common group identity and, therefore, a common feeling of belonging than to those with whom a meaningful shared identity does not exist. The common shared identity may make an ego think that its fate is tied to the fate of the rest of in-group members.

Previous arguments resonate well with the notion of “fictive kinship” introduced by Fordham and Ogbu (1986) in oppositional culture theory. They define it as a collective social identity that describes the specific world view of those persons who are appropriately labelled as belonging to a certain group (Fordham & Ogbu, 1986: 183-184)¹. This concept also suggests that having ancestors of a given ethnicity does not make that person automatically a member of the group neither makes it feel part of it. In their words: “One can be black in color, but not to seek membership in the fictive kinship system, and/or be denied membership by the group because one’s behaviour, activities, and lack of manifest loyalty are at variance with those thought to be appropriate and group-specific” (Fordham & Ogbu, 1986: 184). The strengthened effect of peers occurs, according to oppositional culture theory, when a *shared sense of collective identity exists*. This suggests that co-ethnic peer effects may not occur if two individuals from the same “objective” ethnic group do not feel to belong to the same group.

As mentioned before, ethnic identity seems to be an element that links or, at least, reinforces the link between ego and co-ethnic peers beyond their objective ethnicity. For instance, the notion of “ethnicity as social capital” advanced by Bankston, Caldas and Zhou (1997) and Zhou and Bankston (1994) argues that ethnicity is a set of social relations and shared value orientations among members who identify themselves as members of the same group. When the value orientations of an ethnic group define as desirable a certain aim, prioritise certain behaviours for its achievement and the social relations among the members of the group are oriented towards its pursuit, ethnicity becomes a source of social capital because it facilitates connection between co-ethnics and access to the resources that are embedded in the ethnic social network. A shared identity makes membership to a group and in-group solidarity easier: minority in-group members become more willing to share resources with others who identify as members of the group. That is, “solidarity eases the mobilisation of all kinds of social capital” (Schultz, 2017: 9). Similarly, Kramer (2009) states that “individuals’ social identities — and the connection of those identities to the collective— influence to contribute, or not, to the reservoir of social capital available in the collective in such a way that individuals’ group identity to engage in resource-sharing with those that are considered to be part of the same group. For the same reasons, among those who share the same ethnic identity, ties are more likely to be stronger and, social norms, more likely to diffuse and to more

¹ Fordham and Ogbu (1986) talk about Blacks in the United States when they employ the term “fictive kinship”.

strongly influence their behaviour as compared to those individuals who are not tied to each other on the basis of a common group identity. The previous considerations lead me to formulate the following hypothesis that qualifies expectations contained in H1a and H1b:

Hypothesis 4 (H4): *The effect of ethnic embeddedness (co-ethnic peer effects) on the immigrant advantage in educational expectations is stronger when the percentage of friends with whom the ego shares both an objective and a subjective ethnicity is higher.*

Research design

Data

I use the data from waves 1 and 2 of the German CILS4EU (Kalter et al, 2016a; Kalter et al, 2016b) sample. CILS4EU is an international survey aimed at understanding the intergenerational integration of children of immigrants in four European countries: Germany, England, Sweden and the Netherlands. I restrict analyses to Germany. The panel follows a nationally representative sample of 14/15-year-old students over several years starting from the academic year 2010/2011 (wave 1). In Germany, it is representative of students in the ninth grade of the German education system (last or penultimate grade of lower secondary education). The original sample was drawn using a three-stage design in which schools are the first sampling unit, school classrooms are the second sampling unit—two classrooms were randomly selected in each school—and students within classrooms are the third sampling unit. As a rule, all students in a classroom were surveyed. The original German sample of the first wave consists of 5,013 students nested in 271 classes belonging to 141 schools. This survey is well suited to the aims of this study for two reasons: (i) pupils with a migrant background are over-represented; (ii) in waves 1 and 2 of the survey, a sociometric questionnaire was administered in which all respondents in each classroom were asked to name their five best friends in the classroom. As all nominated students in the classroom responded to the main questionnaire (in theory), it is possible to know the characteristics of ego's friends from their own responses.

The analytical sample comprises those individuals who participate *in wave 1 and wave 2* of the survey. Furthermore, the analytical sample is restricted by the *participation of respondents in both waves in the main questionnaire*—which allows the collection of personal information about respondents—*and in the classmates' questionnaire*—which allows to know, for each respondent, who are his/her five best friends in the classroom—². Additionally, I only include in the analytical sample those individuals who are in the

² I could alternatively include respondents who participate in both waves or who participate only in one wave. This way, the sample size would be larger, but the panel would be unbalanced. This would make confusing to determine whether any observed effect is the result of genuine between- or within-individual variation or the result of missing individuals in the transition from wave 1 to wave 2 (or the result of

same classroom and in the same school in both waves. This is important in order to try to keep the peers' opportunity structure as stable as possible and to minimise the threat of unobserved heterogeneity arising from changes in friend characteristics resulting from a change of school and not from a genuine change in already existing friends' traits.

The sample restriction is also defined by the immigrant generational status groups being compared: natives, third generation immigrants (3G), 2+ generation immigrants (2G+), second-generation immigrants (2G) and first-generation immigrants (1G). In the natives' category, I included "pure" German natives (neither the respondent, nor the parents nor the grandparents are immigrants). In the third-generation immigrant category, I have included third-generation immigrants, 3.25-generation, 3.5-generation, interethnic third generation and 3.75-generation immigrants. In the 2+ generation category, I included 2.5, 2.75 and interethnic second-generation immigrants. In the second-generation immigrant category, I included pure second-generation immigrants (respondents born in the destination country to two parents born abroad). Finally, the first-generation immigrant category includes respondents born abroad with two parents born abroad. For the exact definition of each generation, see Dollmann et al. (2014)³.

Finally, the analytical sample is defined by the absence of missing values in the dependent and independent variables included in the analysis in any of the waves. The total number of unique individuals (cases) included in the analysis is 1956. The number of different observations (individual x wave) is 3912. That is, there are 3912 different person x wave combinations. This clearly indicates that there all respondents are observed twice⁴.

Variables

The dependent variable is the expectation of achieving a university degree. Respondents were asked "what is the highest level of education that you think you will actually get?". They could choose one among the following options: no degree, *Hauptschulabschluss*, *Realschulabschluss*, *Abitur* or university degree. Answers were recoded into a binary

observing individuals in wave 2 and not in wave 1). With a completely even panel in which all respondents are observed twice we may have a selected sample, but, in principle, one can rule out the threat of observing changes in the association of variables that stem from observing some individuals in one wave only.

³ One could reasonably criticise that third-generation immigrants, especially those belonging to the 3.75 or interethnic 3rd generation, are labelled as immigrants, especially if the ancestors with a migration experience are a minority compared to ancestors without a migration experience. Alternatively, one could classify these individuals directly as natives or to exclude them from the analysis given the lack of clarity on how to classify them. I opted to retain them in this 3rd generation category because the CILS4EU survey team had already created the 3rd generation categories on the basis of theoretical and empirical reasons and because I did not want to lose individuals who make up a group that could inform in a relevant way the discussion about the integration outcomes of descendants of immigrants.

⁴ Eventually, I should only include in the analytical sample those respondents who participate in the survey in the school context and in those classrooms where at least 70% of their classmates participate in the classmates' questionnaire. This restriction is advised by the team that developed the survey. In fact, they are more exigent than I, since they propose the exclusion of classrooms where more than 25% of respondents did not participate in the survey. The reason is that sociometric data should reflect most of the classroom interactions (Kruse & Jacob, 2016) and the prevention of biases in the characteristics of friends who are included in the analysis.

variable that distinguishes attainment of a university degree (coded '1') from anything below this degree (coded '0'). I refer to this variable as *university expectations*.

The key independent variable containing information about the ego is the *generation of immigration*. I distinguish the following generational groups as mentioned above: natives, 3G immigrants, 2G+ immigrants, pure 2G immigrants and 1G immigrants. This is a *time invariant* variable that only varies *between* individuals, so I can only estimate the between-individual effect (but not the within-individual effect; see the Methods' section for details). I use the generation of migration measured in wave 1 as reference.

I include a categorical variable that measures the "*objective*" *ethnic group* the respondent belongs to: German, Turkish-origin, origins in Former Soviet Union (FSU) countries, Polish origin, origins in Former Yugoslavian countries, and other minorities. This classification is based on the variable measuring country of origin that the CILS4EU team created (Dollmann et al., 2014). Ethnicity is based on the country of origin of respondents, their parents and their grandparents. Priority is given to older ancestors and, within a generation, to those who are born outside Germany. Moreover, if there is no coincidence in any of the countries of birth of grandparents (i.e. all of them are born outside Germany) or parents (if all grandparents are born in Germany), priority is given to the country of birth of grandmothers —starting from the maternal grandmother— or mothers to define the "objective" ethnicity/country of origin of respondent. This variable is time-invariant. I use the country of origin measured in wave 1 as reference. This item is not included in all regression models.

Other independent variables with information on the ego that need to be considered in order to determine the existence of secondary effects of an immigrant background/immigrant advantage are, first, the *average score in mathematics, English and German* in the pupil's last school report at the time of the survey (this variable is calculated in waves 1 and 2). For this variable, both the individual mean across the two waves (between effect) and the difference between this and the individual score in each wave (within effect) are calculated. Values range from 1 to 6, with higher values indicating worst performance. The second variable is *the type of school/educational pathway* in which the respondent is enrolled: *Hauptschule, Realschule, Gymnasium*, and schools combining different pathways/*Gesamtschule/Rudolf Steiner schools* (time-constant variable; only a between-individual component is included). I use the school type in wave 1 as reference⁵. Third, the *highest ISEI of the parents' occupation*. This variable was only measured in wave 1, so I create an equivalent variable for wave 2 with the same values (implies assuming that parents' ISEI does not change between waves and, therefore, only the between-individual effect can be estimated). Fourth, the *highest educational level of parents* (primary education not completed; primary completed/secondary education not completed; secondary completed/tertiary education not completed; tertiary education; level of education unknown). This information was only asked in wave 1, so I do the same as for the ISEI (the same assumption applies).

⁵ Since respondents do not change schools between waves, this decision is justified.

The first independent variable of interest that measures information about the ego's friends is the *percentage of best friends in the classroom who belong to the same "objective" ethnic group (share of objectively co-ethnic peers) as the ego*. This variable measures the *degree of ethnic embeddedness of respondents*: the higher the percentage co-ethnic peers, the higher/more intense the degree of ethnic embeddedness. It is measured using the respondent's country of origin as defined by the country-of-origin variable created by the CILS4EU team that I explained above. This distinguishes the following countries or groups of countries: Germany, Turkey, Former Soviet Union countries, Poland, Former Yugoslavian countries, Italy, Lebanon, Greece, North Africa, other African countries, Latin America and Caribbean, North America and Oceania, South Asia, West Asia, other Asian countries, Eastern Europe, Southern Europe, other European countries, unknown country of origin, unknown immigrant origin. From the country of origin assigned to the ego and to each of its friends in this variable, I calculate the percentage of ego's friends who share the ego's country of origin with him/her. If and ego and his/her friends' country of origin or immigrant origin is unknown, they are considered as non-co-ethnics. I create both a variable measuring the mean share of co-ethnic friends across time for each individual and the deviation of the score in waves 1 and 2 from the mean to estimate the between-individual effect and the within-individual effect of this variable, respectively.

The second independent variable of interest containing information on the characteristics of friends is the *percentage of best friends with whom the ego shares objective ethnicity (as defined in the previous variable) and subjective ethnic identity (subjective ethnicity)*. The construction of this variable takes as a starting point the country of origin to identify the target ethnic group, as defined above, and refers to it the ethnic self-identification. For each respondent, I determine whether the country of origin (objective ethnicity) matches the ethnic group to which they feel they belong (subjective ethnicity). Then, after aggregating at the level of the ego the information about friends, I calculate the percentage of ego's friends who agree with him/her on both dimensions of ethnicity.

The construction of subjective ethnic identity is made on the basis of a series of questions from the main CILS4EU questionnaire: (i) how strongly respondents feel German (1=very strongly; 4=not at all strongly); (ii) whether they feel they belong to other ethnic/national group(s) (open response); (iii) how strongly they belong to these other groups (in case of declaring a dual or multiple identity: 1=very strongly; 4=not at all strongly).

Starting with those respondents whose country of origin (objective ethnicity) is Germany and, since the question about the intensity of belonging to this country was asked to all respondents, I assign them the subjective German identity if they declare that they do not feel to belong to any other group, regardless of their intensity of belonging to Germany. If they report belonging to other group(s), I assign them German identity in the following situations: (i) if they report feeling very or mostly German and not very much or not at all belonging to this other group; (ii) if they report feeling very or mostly German and very much or mostly belonging to this other group. On the other hand, if they report feeling a little or not at all German, but very much or more of the alternative ethnic group,

they are assigned the ethnic identity of this alternative group. Finally, those respondents who report belonging to other group(s) but feel little or no German and feel little or not at all to the alternative ethnic/national group are assigned a marginalised identity.

Continuing with those respondents who have a country of origin other than Germany (objective ethnicity), if they do not feel they belong to any other ethnic group and feel very or rather German, I assign them the German ethnic identity. I do the same for those individuals who are in the same situation, but their feeling of belonging to Germany is not very or not at all strong. In the case of having a country of origin other than Germany and identifying with one or more ethnic groups, they are assigned the subjective ethnic identity that best fits the objective country of origin according to the categories of the variable measuring this attribute, regardless of the feeling of belonging. If the only alternative identity they report does not fit the country of origin, I assign them that alternative ethnic identity they report. If they report two additional ethnic identities and neither of them can be adequately referenced to the country of origin nor be ranked precisely, I assign this individual to the category "undefined ethnic identity". In this category I also include those individuals for whom information on ethnic identity is not available (so as not to lose them from the analysis).

Once subjective ethnic identity is defined, I re-categorise the variable to fit the categories of the variable measuring objective ethnicity and identify, for each respondent, whether objective and subjective ethnicity coincide. From this operation, I determine whether the ego and each of his or her friends match in objective and subjective ethnicity and, ultimately, I calculate, for each ego, the percentage of friends with whom this match occurs. In some cases, egos nominate more friends than friends for whom information is available. For instance, an ego may have nominated five friends but information might be available only for three of those friends. If these three friends do not share ethnicity with the ego, I would be forced to make an assumption about the share of co-ethnic friends to assign respondents a value in the variable. I proceeded by subtracting the number of non-co-ethnic friends to the number of nominated best friends. Continuing with the example, 5 nominated best friends minus 3 non-co-ethnic best friend would equal two co-ethnic best friends.

The third variable measuring friends' characteristics is the percentage of best friends in the classroom who have an immigrant background. I consider those friends belonging to the first or the second generation of immigration as having an immigrant background. I compute the mean share of friends with an immigrant background across waves (between-individual component of the variable) and the wave-specific deviation from this average (within-individual component of the variable).

I include the following controls to determine whether the effect of friends' "co-ethnicity" is robust to other characteristics: the number of best friends that the respondent nominates (I create the between-individual and a within-individual component of this variable); the average parental ISEI of nominated best friends (between and within-

individual components), and the percentage of nominated best friends who come from families with university-educated parents (between and within-individual components)⁶.

Method

I conduct a longitudinal analysis in which I exploit both the within-individual variation over time between waves 1 and 2 and the overall between-individual variation across waves to determine whether variation in characteristics of best friends in the classroom is associated with the likelihood of having university expectations.

I use longitudinal logistic regression models with *random effects within-between* (REWB). A longitudinal REWB model combines a within-individual fixed effects analysis with a between-individual analysis. The *within-individual analysis* allows to obtain an estimate of the association between the independent variable and the dependent variable from exploiting within-individual variation over time, controlling for time-constant unobserved heterogeneity at the individual level. The *between-individual analysis* allows to obtain an estimate of the association between variables from the "overall" variation observed between individuals across waves. This is achieved, first, by calculating, for each individual, the mean of the independent variable of interest across waves. This overall mean makes possible to exploit the variation between individuals and to obtain the estimate of the between-individual effect. Second, for each individual, the difference between the value of the independent variable of interest in each wave and the corresponding mean across waves is calculated. This difference makes it possible to exploit intra-individual variation over time and to estimate the within effect (Bell & Jones, 2015; Schröder, 2018). The REWB model, beyond allowing the estimation of both effects, offers a crucial advantage for this study: it allows using variables that do not vary over time and that, therefore, could not be used in a standard individual fixed effects model. This is the case of the main independent variable: the generational status of the respondent. When this is the case, only the between effect can be calculated, as there is no longitudinal variation to exploit. I compute an interaction between the variable measuring immigrant generation and the between and within component of friends' characteristics, which do vary over time, to estimate the effect of friends' characteristics for each of these immigrant status groups.

The nesting structure of the observations implies that the lower level is constituted by individuals observed in a specific wave of the survey (individual x wave) grouped into an upper level, constituted by the individuals. Individuals are grouped into classrooms and schools in the sampling design, but the latter two nesting levels are not specified in this analysis. Robust standard errors are defined at the individual level.

The equation of a REWB model is the following:

$$\text{logit}[P(y_{it} = 1)] = \beta_0 + \beta_1(x_{it} - \bar{x}_i) + \beta_2\bar{x}_i + \beta_3\bar{\delta}_i + \beta_4(x_{it} - \bar{x}_i)\bar{\delta}_i + \beta_5\bar{x}_i\bar{\delta}_i + u_t + \epsilon_{it}$$

⁶ All the ego's nominated friends are included in the computation of the friends' variables if there is valid information in their relevant characteristics. Therefore, the only exclusion condition is not having valid values in the variables of interest.

Where $\text{logit}[P(y_{it} = 1)]$ is the logistic transformation of the probability of experiencing the outcome for person i at time t . $\beta_1(x_{it} - \bar{x}_i)$ is the effect of the *within-individual variation* across time of *time-varying independent variables* (within-effect); $\beta_2\bar{x}_i$ is the effect of the *between-individual variation of time-varying independent variables* (between-effect); $\beta_3\bar{\delta}_i$ is the *effect of time-invariant variables* which only vary between individuals (between-effect; for instance, immigrant generation); $\beta_4(x_{it} - \bar{x}_i)\bar{\delta}_i$ and $\beta_5\bar{x}_i\bar{\delta}_i$ indicate, respectively, the interaction between variables which only vary *between individuals* ($\bar{\delta}_i$) and variables which vary *within* ($x_{it} - \bar{x}_i$) and *between individuals* (\bar{x}_i); u_t is the measurement error for the between-individual variation and ϵ_{it} is the measurement error for the within-individual variation.

Statistical analyses are carried out in Stata 16 with the command ‘xtlogit’. Robust standard errors at the individual level are specified using the ‘vce(robust)’ option. Survey weights are not employed.

Results

Descriptive statistics

Table 1 contains the descriptive statistics of time-varying variables, whereas Table 2 contains descriptive statistics of time-constant variables, but which vary across individuals. Starting with the dependent variable (cf. Table 1), most respondents do not expect to achieve a university diploma in neither wave, although in wave 2 the percentage of those expecting it increases as compared to wave 1. 19% of respondents have university expectations in wave 1, whereas 25% do have them in wave 2. University expectations vary more *between individuals* than *within individuals over time*.

In terms of the immigrant generational status in wave 1 (cf. Table 2), almost 50% of the sample is made up of native students. The remaining 50% is made up of students with an immigrant background, mainly pure second-generation immigrants (22%), followed by 2+ and third generation immigrants (11% each) and first-generation immigrants (7%). Regarding country of origin/objective ethnicity (cf. Table 2), almost 50% of respondents have a German background. They are clearly the majority group. The main ethnic minority are respondents with Turkish origin (14% of respondents), followed by respondents with a background from Former Soviet Union countries (6%), Poland (6%) and Former Yugoslavian countries (3%). The remaining respondents belong to the “other minorities” category. The cross-tabulation of these two variables (results not shown) indicates that the native category is made up only of German-origin respondents. The third and 2+ generations are made up mainly of “other minorities” and the main specific origin groups are Polish and Turks, respectively. Among the second generation, the main group are Turkish-origin respondents, followed by other minorities. Finally, among the first generation, the main groups are other minorities, followed by respondents from Former Soviet Union countries and Turkey. Remaining groups are much less represented.

The average grade in the last school report across waves (cf. Table 1) is very similar for all immigrant/generational groups. Natives have a slightly better grade than

respondents with an immigrant background. The worst-performing group are second-generation immigrants. Regarding the school type respondents are enrolled in (cf. Table 2), 19% are in *Hauptschule*; 33% are in *Realschule*; 28% attend comprehensive schools (*Gesamtschule*) or schools combining several tracks, and 21% are enrolled in *Gymnasium*. Natives and third-generation immigrants are underrepresented in the *Hauptschule*, the track that is attended by the worst-performing pupils and the one that offers worst prospects for the continuation of the academic career. Conversely, second-generation and first-generation immigrants are clearly overrepresented in this track and clearly underrepresented in the *Gymnasium*. This is the pathway that most directly leads to university.

The social background of native students is more advantaged than that of immigrant-origin students. Their family ISEI score (cf. Table 2) is higher, although differences with third-generation immigrants are small. Second-generation immigrants come, on average, from the less socioeconomically advantaged families. The dominant parental educational level in the overall sample (cf. Table 2) is completed secondary education, although there are some differences across groups. The distribution of parental educational attainment is very similar among natives and third-generation immigrants. Second-generation immigrants come from the most educationally disadvantaged families –highest rate of primary education completed at most; lowest rate of tertiary education–. First and 2+ generation immigrants have the highest rates of tertiary educated parents. Among the former, the rate of respondents with only primary educated parents is also the highest.

Regarding friends' characteristics, the overall percentage of objectively co-ethnic friends among best friends is 39% (cf. Table 1). This variable varies much more between individuals than within any given individual across time for all immigrant generations. Native students have a much larger overall share of objectively co-ethnic friends (59%) than immigrant-origin students—a reasonable result given that the latter are the majority group—. They are followed by second-generation immigrants, first-generation immigrants, G2+ and third-generation immigrants (8%). The overall percentage of best friends with whom the ego shares objective and subjective ethnicity is lower (cf. Table 1): 33%. It's between variation is again much larger than the within variation. This percentage is largest among natives (57%), whereas it is lowest among third generation immigrants (4%). This suggests that the likelihood of finding clustering of *objectively and subjectively* co-ethnic friends among immigrant-origin students, in general, and G3 students, in particular, is low. Moreover, finding a differential effect of the co-ethnicity of peers depending on the confluence of subjective ethnic identities in the peer group seems difficult since the *percentage of objectively (only) co-ethnic peers* and the *percentage of objectively and subjectively co-ethnic peers* are highly correlated—the correlation is $r=0.92$ for natives and ranges from $r=0.50$ to $r=0.60$ for the different immigrant generations (data for wave 1, only; results not shown)—. Finally, the average family ISEI score of nominated best friends in the classroom (cf. Table 1) is quite similar for native and G3 immigrants and higher for these two groups as compared to people from other generations of immigration. The share of best friends coming from families where any of the parents has university education (cf. Table 1) is again highest for natives and G3 immigrants and lowest for G2 and G1 immigrants.

[TABLE 1]

[TABLE 2]

I checked whether the analytical sample—in wave 1—differs from the sample that is not included in the analysis in order to determine whether I am observing a selected sample (results not shown)⁷. There are several differences that point that the analytical sample is positively selected in terms of academic performance and social origins. The share of natives and G3 immigrants is comparatively higher in the analytical sample as compared to the sample that is not included in the analysis, whereas the share of G2+, G2 and G1 immigrants is lower. Students enrolled in the *Hauptschule* are less likely in the analytical sample than in the sample excluded from the analysis. Students enrolled in the *Realschule*, *Gymnasium* and schools combining several tracks are more likely in the analytical sample than in the non-analytical one. The under/overrepresentation seems high. German and Polish-origin students are more likely in the analytical sample than in the non-analytical one. The opposite happens to students with Turkish, FSU and Former Yugoslavian origin. The average grade is slightly higher in the analytical sample. Adolescents coming from families whose parents have completed secondary education and completed tertiary education are highly overrepresented in the analytical sample as compared to the non-analytical sample, whereas those who come from families with unknown education are severely underrepresented. Respondents in the analytical sample also have a higher share of objective co-ethnic friends and a higher percentage of friends with whom they share and objective and a subjective ethnicity. Finally, the mean ISEI of best friends and the mean share of best friends whose parents have university education are higher among respondents in the analytical sample than among respondents excluded from it. In brief, the analytical sample is characterised for having more natives and G3 immigrants and fewer G2+, G2 and G1 immigrants; higher-performing and more socioeconomically-advantaged respondents; respondents with an average higher share of co-ethnic friends and of friends with whom they share objective and subjective ethnicity.

The over/underrepresentation of the analytical sample in comparison with the non-analytical sample is likely to happen due to the exclusion from the former of those students who do not participate in the survey in the school-context in wave 2 and, therefore, who are not able to fill in the sociometric questionnaire. These respondents tend to be those who are enrolled in wave 1 in the *Hauptschule* and who drop out from schooling between wave 1 and 2 or do not attend school full time anymore. These students are the less academically engaged, since *Hauptschule* is the school type/track that less options for a long educational career offer and a track that prepares students for vocational training. These students are also the ones that have on average the lowest socioeconomic status. The fact that *Hauptschule* students are also, on average, the worst-academically

⁷ These results are not yet properly included in the document as formatted tables, but they will eventually be.

performing contributes to explain why the average grade in the non-analytical sample is lower compared to the analytical sample.

Main analyses

Table 2 contains the results of the successive longitudinal models fitted to the analytical sample using the REWB specification. Model 1 contains the generational status of respondents as single independent variable. Its aim is to establish whether significant differences exist among immigrant generations in the likelihood of expecting a university diploma. Since this independent variable only varies *between* individuals, only the overall between-individual variation can be analysed. Results show that no significant gross differences (neither substantively nor statistically) exist between the different immigrant generations and natives.

[TABLE 3]

Model 2 incorporates the variables measuring school grades (both the between and the within component), school track, sex, parents ISEI, and parents' highest level of education. This model allows to identify any significant immigrant advantage in expectations (i.e., secondary effects of an immigrant background in university expectations). Results indicate that G2 and G1 immigrants have a statistically significant higher likelihood of expecting a university degree than natives. G3 and G2+ immigrants also have higher chances of expecting a university degree, but their differences vis-à-vis natives are not statistically significant. G2 is the group with the largest advantage. Odds ratios in the table are mirrored in the predicted probabilities plotted in Figure 1. Whereas 19% of natives expect a university diploma, 29.5% of G2 immigrants and 24% of G1 immigrants do so. This pattern of immigrant advantage resembles the one repeatedly found in previous studies on Germany and other countries. Is this advantage driven by the ethnicity of respondents? I add this variable in Model 3 to answer this question. The positive effect of all generational groups vis-à-vis natives remains. Therefore, the generational effect does not seem to be driven by the ethnic composition of the sample and the heterogeneity of ethnic origins across generational groups. Moreover, the statistical significance of generational differences is reinforced. Respondents whose background is in FSU, Poland and Former Yugoslavian countries have a lower (and statistically significant) likelihood of expecting a university diploma than natives. Conversely, Turkish-origin adolescents have a higher likelihood of expecting this outcome than the reference group, but the difference is not statistically significant. These results are partially similar to those found by others in Germany, especially the finding that Turkish-origin youth has, on average, the highest educational expectations (cf. Salikutluk, 2016; Tjaden, 2016; Tjaden & Scharenberg, 2017).

[FIGURE 1]

The between and within components of the percentage of *objectively coethnic friends* are introduced in Model 4. Apparently, neither component of this friends' characteristic

seems to have any relevant effect on the likelihood of expecting a university diploma: the odds ratio for both components is virtually 1, and the upper and lower bounds of confidence intervals are very close to 1. The predicted probabilities of the between and within components reflect more clearly the estimated weak main effect (cf. Figure A1 in Appendix). When a respondent has no co-ethnic friends (between effect), the probability of expecting a university diploma is 21.9%. When 100% of best friends are co-ethnics, the probability of university expectations rises to 22.6%. Changes across time in the share of co-ethnic best friends (within effect) have a slightly stronger effect, although still small. The probability of university expectations for those who have the *same share of co-ethnic friends* in t_1 and t_2 is 22%. Those individuals who have *50% less co-ethnic friends* in t_2 compared to its average across waves have a 20% probability of expecting a university degree. Those who have *50% more co-ethnic friends* have a 24% probability of experiencing this outcome. If the number of nominated best friends (between and within components) is included in the model as an additional control variable, the main effect of the percentage of co-ethnic best friends does not seem to change significantly (results not shown). Despite the non-statistical significance of this variable and its weak effect, we see that both sources of variation have the same effect (more friends, higher expectations).

The question that now begs an answer is whether the already documented immigrant advantage in university expectations is boosted or depressed when there is a larger share of *objectively* co-ethnic friends among the reported best friends of the ego. That is, whether ethnic embeddedness has a positive or a negative effect on the immigrant advantage in expectations. This question is answered in Models 5a and 5b and in Figures 2 and 3. These models contain the interaction between immigrant generation and the between and within component of the percentage of co-ethnic best friends⁸, controlling for academic performance and socioeconomic status.

Model 5a contains the results of the interaction between *immigrant generation* and the *between-individual component* of the share of co-ethnic friends. The results of this interaction in terms of predicted probabilities are plotted in Figure 2 (left panel). The interaction is positive and statistically significant for G2+ and for G2 immigrants. This means that a larger percentage of objectively co-ethnic friends is associated with a larger immigrant advantage. The effect is stronger and more accurately estimated for G2 than for G2+⁹. Note that the estimated probability of expecting a university degree for second-generation immigrants rises from a 25% probability when they have no co-ethnic friends to 43% when 100% of their friends are co-ethnic. Nevertheless, G2 respondents with high shares of co-ethnic friends are rare, so estimates at these levels are inaccurate. Conversely, for G3 and G1 immigrants, co-ethnic peer effects are negative, although only statistically

⁸ It is important to note that then ethnicity of the respondent has been excluded from the model because predicted probabilities and average marginal effects of generation of immigration and ethnicity cannot be estimated if these two variables are introduced at the same time in regression models. The reason is, probably, that the “native” category in the variable measuring generation of immigration overlaps perfectly with the “German” category in the variable measuring the ethnicity of respondents.

⁹ This seems reasonable since the sample size of second-generation immigrants is much larger than that of generation 2+ immigrants.

significant for the former. For G1 immigrants we indeed observe that the effect is comparatively small. In the case of G3 immigrants, university expectations suffer a steep decrease as the percentage of co-ethnic friends increases. It is important to note that any change in the migrant-native gap in expectations is mostly due to *changes in the expectations of immigrant-origin students*, not of natives, since the expectations of the latter remain almost unaltered across the scale of co-ethnic friends. This suggests that the significance of ethnic embeddedness is very different for natives and immigrant-origin individuals and that being surrounded by co-ethnics matters if one belongs to a minority that is extraordinary as compared to what happens in society. This also gives credit to the study of the role of ethnic embeddedness in the process of educational attainment of people with an immigrant-origin. The fact that ethnic embeddedness has a very minor effect on natives and that this group is the largest could also explain the weak main effect of the share of co-ethnic friends.

[FIGURE 2]

Model 5b contains the results of the interaction between immigrant generation and the within-individual component of the share of co-ethnic friends. The results of this interaction in terms of predicted probabilities are plotted in the right panel in Figure 2. The interaction is positive for 3G, 2G+ and 2G immigrants. It is negative for 1G immigrants. An increase over time for any given individual in his/her share of objectively co-ethnic friends compared to his/her mean across waves is associated with a higher probability of expecting university in the case of G3, G2+ and G2 immigrants and a growing gap with natives. It is associated with lower probabilities for G1 immigrants and a decreasing gap with natives. None of the interactions is statistically significant. This is understandable because the within-individual variation over time in the share of co-ethnic friends and in university expectations are small and I am observing a small-time window. Moreover, I am analysing students who do not change neither classrooms nor school tracks during this period. The estimated within effect and the generation rank order is quite coherent with the estimated between effect, with the only exception of 3G immigrants. In addition, native students seem unaffected by the co-ethnicity of their peers—as occurs with the between-individual variation—, so any increase/decrease of the immigrant advantage is mostly due to changes among immigrant-origin youth. All in all, these results provide partial evidence for both hypotheses 1a and 1b, but it must be added that no universally positive or negative co-ethnic peer effects can be claimed. Moreover, the fact that both between and within variation in co-ethnic peer effects have the same sign for G2+ (positive), G2 (positive) and G1 (negative) reinforces the findings of the between-individual analysis and provides more evidence in favour of the observed effects.

I check in an additional model (results not shown) whether all ethnic groups are affected in the same way by the share of co-ethnics in their friends' group. This model is very similar to Model 5a, but I exclude the variable measuring generational status (see footnote 5 for an explanation). I compute the interaction between ego's ethnicity and the between-individual component of the percentage of objectively co-ethnic peers, only. I proceed this way since it is the one that offers better prospects to estimate associations

accurately given the larger between-individual variation. Results indicate that Turkish, Polish and Former Yugoslavian-origin respondents increase their expectations when the share of co-ethnic friends is larger, but the opposite happens for youth whose origins are in FSU countries. The interaction is not statistically significant for any group (cf. Figure A2 in Appendix), albeit the estimate for Turks is close to statistical significance at the 95% confidence level. This is reasonable given the small sample size of ethnic minorities. Results for Turks are coherent with the findings obtained by Lorenz et al. (2021), who also found that ethnic embeddedness increases the educational expectations of Turkish-origin adolescents in Germany.

In the next step (Models 6a and 6b in Table 1), I introduce the percentage of immigrant-origin friends among the five best friends to check whether the moderating effect of co-ethnic friends remains, since this new variable might be an alternative source of advantage/disadvantage for youth with an immigrant background. The analysis is made for the between and the within components of both variables measuring peers' characteristics. The inclusion of this factor does not significantly alter neither the sign nor the effect size of the interaction between immigrant generation and the share of coethnic friends. I reach this conclusion by comparing the average marginal effects of each generation of immigration on university expectations at different percentages of objectively co-ethnic friends from models without (Models 5a and 5b) and with the share of immigrant-origin friends (Models 6a and 6b) included as a variable (cf. Table A1 and A2 in the Appendix). The difference between the average marginal effects is zero or very close to zero both for between-individual variation and the within-individual variation. As can be seen, the AMEs with and without the control are virtually the same. In addition, the main effect of the share of immigrant-origin friends on expectations is close to zero (cf. Models 6a and 6b in Table 1). These results run against hypothesis 2, which states that the immigrant background of friends contributes to explain co-ethnic peer effects.

The next stage involves testing whether a larger share of immigrant-origin peers among best friends moderates the immigrant advantage in educational expectations. This is done by computing an interaction between the generation of immigration and the share of best friends with immigrant origins (between and within). The results are displayed in Models 7a and 7b and plotted in Figure 3. Neither the interaction of the between effect and generation of immigration nor the interaction of the within effect and generation of immigration are statistically significant, with the only exception of the between-effect for G2 immigrants. For these, a larger percentage of friends with immigrant origins is associated with a larger immigrant advantage. The interaction with the within component is not statistically significant, but the effect is equally positive (albeit very small), so both pieces of evidence point in the same direction. This increase is the result of changes among G2 immigrants only, since the reference group, natives, do not seem to be affected by the immigrant background of their best friends. Apart from G2 immigrants, I cannot claim, with the current data, that the immigrant background of peers has any effect on ego's educational expectations. Despite the non-statistical significance of results, for other groups the evidence is quite mixed: for G3, the between-individual effect is negative, but the within-individual effect is positive; for G2+ and G1, the between-individual effect is positive, but the within-individual effect is negative. All in all, evidence on H3a and

H3b suggest that neither becomes more solid, since a zero effect of immigrant peers cannot be ruled out. If anything, only H3a has some evidence in favour given the positive and significant effect of immigrant peers on youth from the second generation of immigration. This said, these results might be understood as a word of caution against formulating universal claims on how people from different generations of immigration are affected by immigrant-origin peers. Rather, more nuanced hypotheses depending on the generation should be formulated.

[FIGURE 3]

Finally, I explore whether the confluence of the objective and the subjective ethnicity of ego and peers reinforces the university expectations of immigrant-origin students. I fit a regression model containing the interaction ‘generation of immigration x share of objectively coethnic best friends’, segmenting the sample by levels of the variable that measures the *percentage of best friends with whom the ego shares objective and subjective ethnicity*. More specifically, I compare the results of the interaction for respondents with less than 50% of best friends with whom they share objective and subjective ethnicity and for respondents with or more than 50% of best friends with whom they share objective and subjective ethnicity. If the corresponding hypothesis, H4, was true, I should find larger differences between generational groups compared to natives among the sample that comprises individuals with $\geq 50\%$ friends with whom ego shares objective and subjective ethnicity than among individuals with $< 50\%$ of friends with whom they share objective and subjective ethnicity. These models include controls for the average ISEI score of best friends and the percentage of friends who come from families with university-educated parents. The (abbreviated) results of these interactions are shown in Table 3 and plotted in Figures 4 (interaction with the between component) and 5 (interaction with the within component).

[TABLE 4]

The only immigrant-origin group that can be adequately compared to natives are second-generation immigrants. It is the only one sufficiently big in terms of sample size to allow computing reliable estimates. For other immigrant groups, unfortunately, there are too few respondents who share objective and subjective ethnicity with more than 50% of their best friends, so they were excluded from the presentation of results (not from the regression models). Starting with the between-individual effects, at lower percentages of (objectively) co-ethnic friends, the estimated native-G2 gap is wider among respondents who have more than 50% of friends with whom they share objective and subjective ethnicity than in the group where the percentage of friends meeting this condition is below 50%. However, as the percentage of objectively co-ethnic friends increases, the gap becomes much wider among respondents who share objective and subjective ethnicity with less than 50% of their friends. This can be seen in Figure 4 and also in Table A3 in the Appendix. This table displays the ratio between the probability of expecting a university diploma for G2 immigrants and the corresponding probability for natives at

different percentages of objectively co-ethnic friends for respondents with less than and with 50% or more of their best friends sharing with them objective and subjective ethnicity. A higher ratio indicates that the probability of expecting a university diploma is proportionately higher for G2 immigrants than for natives. Thus, a larger ratio indicates a wider gap. For instance, the ratios are lower in the former group when the % of objectively co-ethnic friends is 0 (ratio G2 vs natives = 1.03) and 20% (ratio = 1.33) than in the latter group (ratio when 0% of friends are objectively co-ethnic = 1.64; ratio when 20% are objectively co-ethnic = 1.69). The increasingly larger gap among the group with a lower confluence of objective and subjective ethnicity occurs both because G2 immigrants increase their probability of expecting university and natives decrease it. In the other segment of the sample, both G2 immigrants and natives increase their university expectations, but the former does so at a relatively higher pace. Moreover, the interaction is statistically significant only in the group where less than 50% of friends share objective and subjective ethnicity with ego. All in all, these results do not provide support for Hypothesis 4. They are more complex and nuanced than the initial expectation.

[FIGURE 4]

Continuing with the within-individual analysis (Figure 5; Table A3 in Appendix), the advantage for G2 decreases as the percentage of objectively co-ethnic peer increases over time with respect to the average percentage for any individual when there are less than 50% co-ethnic friends with whom ego shares also subjective ethnicity. The reduction is completely due to an increase in the probability of university expectations of natives, since the university expectations of G2 remains quite stable. Conversely, the advantage in expectations of G2 immigrants strengthens clearly among those respondents who share objective and subjective ethnicity with 50% or more of their best friends. The growing advantage is mostly due to changes in the probability of university expectations among G2 immigrants. Neither interaction is statistically significant. Therefore, results for the within-individual variation are quite different depending on the subsample analysed. They are more coherent with the expectation formulated in Hypothesis 4 than the results of the between-individual analysis, but the fact that there is basically no within individual variation among G2 immigrants in the group of respondents with less than 50% of their friends with whom they share objective and subjective ethnicity leads me to reject Hypothesis 4¹⁰.

[FIGURE 5]

¹⁰ The underlying expectation is that there would be an immigrant advantage caused by an increase in the university expectations of immigrants.

Robustness checks¹¹

I report the results of several checks aimed at establishing the robustness of results to different specifications of the analytical sample. A first concern I deal with is the selectivity of the sample derived from only considering respondents who fill in the questionnaire in wave 1 and wave 2 in the school context and who do not change schools between waves. This implies that I lose a proportionately higher share of the sample of students enrolled in *Hauptschule* than in other types of school as compared to the full sample of the survey. This occurs because students enrolled in *Hauptschule* in wave 1 are less likely to participate in the survey in the school in wave 2. In the first robustness check, I fit a logistic regression model with robust standard errors at the individual level. I use the *sample from wave 1, only*, containing respondents with no missing values in any of the independent and dependent variables considered in this study and who participate in wave 1 in the main and sociometric questionnaire in the school context. For this robustness check, participation status in wave 2 is irrelevant, as I only consider wave 1. Therefore, I do not carry out a longitudinal analysis, but a cross-sectional one. Its results are comparable to those of the between-individual analysis of the main results. I focus only on the moderating effect of objectively co-ethnic peers, not on the joint effect of the objective and subjective ethnicity of peers. The question I want to answer is whether the main results hold if I use an analytical sample that more accurately represents the full sample weight of respondents enrolled in the *Hauptschule*.

The results of this robustness check are shown in Model 1 in Table A4 in the Appendix. The sign and pattern of the interaction between generation of immigration and the share of objectively co-ethnic friends in the classroom is the same as in the main analyses: a larger share of objectively co-ethnic peers positively increases the gap in university expectations of G2+ and G2 with natives; decreases the gap of G1 with natives, and negatively increases the gap of G3 immigrants with natives (i.e., university expectations of G3 immigrants become lower as the share of objectively co-ethnic peers increases). The increase/decrease in the migrant-native gap is mainly due to changes in the university expectations of immigrant-origin students, since the university expectations of natives change slightly. This is the same that happens in the main analyses. Contrary to what happens in the latter, the positive effect of the interaction in the robustness check is largest for G2+ than for G2. In fact, the only statistically significant interaction is for G2+ immigrants. The computation of the average marginal effects for respondents attending the *Hauptschule* (only) shows that the same overall relationship exists in this subsample than in the full analytical sample used in this robustness check. My conclusion is that the main results are not biased if I use a selected sample that excludes a proportionally higher share of *Hauptschule* students than of students enrolled in other school types.

¹¹ Table of results of the robustness checks reported in this section have not yet been included in the document containing the Appendix, but they will be eventually included.

In the main analyses I did not consider the nesting of respondents in classrooms and schools and I did not introduce CILS4EU survey weights because the ‘xtlogit’ command does not allow them. In the second robustness check, I specify explicitly the double nesting structure and I use survey weights in a multilevel logistic regression model fitted to the same sample used in the first robustness check. This analysis is, again, cross-sectional and I use data from wave 1 only. Therefore, only the between-individual effect can be estimated. I specify random slopes at the school and classroom level. I use ‘houwgt’ as a probability weight in Stata (‘pweight=houwgt’). Results are shown in Model 2 in Table A5 in the Appendix. The interaction between the share of objectively co-ethnic friends and generation of immigration is positive and statistically significant for G2 and G2+ immigrants, as happens in the main analyses. The strength of the interaction, as judged by the coefficient, is very similar for both groups. The interaction is negative but not statistically significant for G1 immigrants, as happens in the results from the main analyses. The interaction is virtually zero for G3 immigrants (the odds ratios equals 1.002) and it is not statistically significant. This suggests that ethnic embeddedness barely moderates the negative migrant-native gap in university expectations when G3 immigrants are considered. With the last exception, the results of this robustness check are quite coherent with the results of the main analyses.

In a third robustness check, I replicated the exact same preceding model but I fitted it to the analytical sample used in the main analyses, using again the measurements from wave 1 only. Therefore, only the between-individual effect can be estimated. Results are shown in Model 3 in Table A5. We see again that ethnic embeddedness boosts the immigrant advantage for G2+ and G2 immigrants. The “boosting effect” is stronger for G2+ than for G2 immigrants, as happens in the first robustness check. The interaction is statistically significant only for G2+ immigrants. This finding is similar to the one from the main analyses and the preceding robustness checks. For G1 immigrants, I identify again a negative effect of ethnic embeddedness (not statistically significant). For G3 immigrants, the interaction is negative, as happens in the first robustness check and in the main analyses. My conclusion from the second and third robustness checks is that their results are highly consistent with the results obtained in the main analyses.

The fourth robustness check incorporates a variable measured at the school level: the percentage of co-ethnic students in the school. This variable is included to control for the opportunity structure of respondents in terms of the availability of co-ethnic peers with whom to interact in the school and with whom to befriend. In schools with many co-ethnic students there are, at face value, much more opportunities of interaction and of becoming friends with them than in schools with few co-ethnic peers. In schools with many co-ethnic peers, ethnic friendships might be less selective because they might be the standard as a result of the higher presence of the latter. In schools with few peers, this might not be the case. By including this school-level variable, I am also able to isolate the effect of co-ethnic friends from the effect co-ethnic schoolmates. This is important because schoolmates’ and friends’ peer effects might operate through similar mechanisms. I use the same analytical sample as in the main analyses, I specify random slopes at the school level (generation of immigration) and random intercepts at the classroom level. I

use the weighting variable ‘houwgt’ as a probability wave. I run a cross-sectional analysis with data from wave 1. Hence, only the between-individual effect can be analysed.

The results of the robustness check indicate that a higher share of co-ethnic friends among best friends increases positively the gap in university expectations for G2+ and G2 immigrants as compared to natives, controlling for the share of co-ethnic peers in the school. The interaction for both groups is statistically significant and of similar size. Conversely, for G3 and G1 immigrants a higher share of co-ethnic friends among best friends increases negatively the gap with natives. This means, for G3, that a higher share of co-ethnic friends is associated with lower university expectations vis-à-vis natives. For G1 immigrants, this means that a higher share of co-ethnic friends narrows their higher university expectations as compared to natives and, from a certain point along the scale of the percentage of co-ethnic peers, the gap turns negative (i.e., G1 immigrants have a lower probability of university expectations than natives). However, neither for G3 nor for G1 the interaction is statistically significant. As happens in previous analyses, natives are the group which less intensely modifies its probability of university expectations when exposed at different percentage of co-ethnic peers, although they also experience a slight decrease in the probability of university expectations. Therefore, changes in the size of the migrant-native gap are due mainly to changes among immigrant-origin students.

Conclusion

I analyse in this paper whether embeddedness in co-ethnic friendship groups in the classroom moderates the gap in the probability of expecting university of adolescents with immigrant origins who belong to the third generation, the 2+ generation, the second generation or the first generation of immigration as compared to native students without any immigrant background. In addition, I explore whether any effect of ethnic embeddedness is explained by the immigrant-origin of ego’s peers, since ethnic minority background and immigrant background are likely to overlap. Furthermore, I investigate whether a growing proportion of friends with immigrant-origins moderates the native-migrant gap in university expectations, net of the effect of the co-ethnicity of peers. Finally, I analyse whether the effect of ethnic embeddedness on the migrant-native gap in university expectations (“immigrant advantage”) is strengthened when an ego has a larger share of friends with whom he/she shares objective and subjective ethnicity. The analyses are carried out by means of random effects within-between (REWB) longitudinal logistic regressions with data from the German sample of CILS4EU.

My findings show, first, that students belonging to all the immigrant generations included in the analyses have a higher average probability of expecting a university diploma than natives once academic performance and socioeconomic status are controlled for. The “immigrant advantage” is statistically significant only for G2 and G1 immigrants. The finding that immigrant-origin students from different generations have higher educational expectations than natives in Germany is coherent with findings from previous research, although it is more disputed whether this holds for all national origins to the same extent or whether immigrant generation still matters when national origin is controlled for (e.g., Hadjar & Scharf, 2020; Rudolphi & Salikutluk, 2021).

Second, co-ethnic peer effects increase the immigrant advantage for G2 and G2+ immigrants both when the between and the within-individual variation are analysed, although only the effect of the between-individual component of the ethnicity of peers is statistically significant. However, the fact that both sources of variation enable to conclude the same about the effect of co-ethnic peers gives credibility to its existence. In other words: ethnic embeddedness is consistently associated with the immigrant advantage for these two generations. This runs contrary to the expectations derived from assimilationism, which argues that a persistent clustering in ethnic groups across generations would be an indication of failed integration and a factor that undermines the adequate structural integration of immigrants. On the contrary, ethnic clustering would be beneficial for the structural integration of G2 and G2+ immigrants in Germany. Conversely, co-ethnic peer effects are negative for G1 immigrants both when the between and within-individual variation are analysed, but in neither case differences with natives are statistically significant. It must be noted that differences between G1 immigrants and natives are the smallest differences found. Moreover, the negative effect never reflects lower university expectations for this group vis-à-vis natives, but a decreasing advantage. Finally, the between-effect of co-ethnic peers on the native-3G migrant gap is negative, but the within-effect is positive. Neither of them is statistically significant. Making sense of this last mixed pattern of results for this generation is difficult, especially because G3 is the group that should be the more similar to natives, given the distance of the migration experience to the life experience of respondents. However, a word of caution about this group is necessary. First, it lumps together respondents for whom, in some cases, the migration background in the family is not only distant but marginal. Second, it is the group who has the lowest average percentage of objectively co-ethnic best friends, so finding respondents belonging to the third generation with many co-ethnic friends is rare. Therefore, estimates of the native-G3 expectations gap at high percentages of objectively co-ethnic peers are likely to be based on a small sample of G3 respondents. The same concern regarding the sample size applies to G1 immigrants, although the latter have a much higher average share of co-ethnic friends.

The previously reported findings are partly comparable to those of Lorenz et al. (2021), who also studied the effect of co-ethnic peers on the educational expectations of ethnic minorities in Germany. They did not study university expectations specifically, but a scale of educational expectations. They did not compare immigrant-origin adolescents to natives but ethnic minority adolescents, mainly Turkish, to natives. Using standard regression analysis, they find that the educational expectations of Turkish-origin adolescents increase as they have more co-ethnic friends among their five best friends. This finding is coherent with the findings reported in the previous paragraph and with the additional finding of the positive effect of the share of co-ethnic peers on the university expectations of Turks. However, Lorenz et al. (2021) additionally show, resorting to longitudinal social network analysis techniques, that the co-ethnic peer effect among Turks does not emerge, which could indicate that it is the result of the self-selection of adolescents in friendship groups.

Third, the results of the interaction remain mostly unaltered when the percentage of friends with immigrant-origins is controlled for. This indicates that the *immigrant-origin*

of friends does not explain the effect of their *ethnic origin* on the ego and that the latter are independent of the former. This suggests that immigrant and ethnic background have independent effects. The finding runs counter H2. In addition, the effect of immigrant-origin peers is consistently positive for the immigrant advantage of G2 immigrants: a larger share of immigrant-origin peers increases the immigrant advantage in expectations for this group vis-à-vis natives. This applies when both the between and the within-individual variation are analysed. Conversely, for G3, G2+ and G1 immigrants the picture is quite mixed because between and within-effects point in different directions.

Finally, the effect of objectively co-ethnic peers is not clearly strengthened when the ego has a larger percentage of friends with whom he/she shares objective and subjective ethnicity. This leads to conclude that a shared ethnic identity does not work as an element that reinforces peer effects on educational expectations, contrary to the expectation derived from social identity theory. This analysis is done for G2 vs natives only because G2 immigrants are the only group with a sample size large enough to ensure enough cases for the demanding sample segmentation that is required. The analysis of the between-individual variation shows that the immigrant advantage is more pronounced among those respondents who share objective and subjective ethnicity with *less than 50% of their friends*, as compared to the group of respondents who share these traits with more than 50% of their friends. The interaction is not statistically significant, however. The analysis of the within-individual variation, on the contrary, shows that the immigrant advantage becomes more pronounced in the group of people with 50% or more of their friends sharing with them objective and subjective ethnicity. None of the interactions analysed are statistically significant. Beyond these aspects, I conclude that H4 is not supported by the data because the pattern of results departs considerably from the underlying expectation: that there would be a growing immigrant advantage both among respondents with less than 50% of friends with shared objective and subjective ethnicity and among respondents with a higher percentage of friends with this characteristic.

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TABLE 1. Descriptive statistics of time-varying variables

	Total	Native	G3	G2+	G2	G1
Dependent variable						
Highest educational degree expected						
Wave 1; Less than a university degree	81.08	81.04	80.66	78.95	82.33	81.43
Wave 1: University degree	18.92	18.96	19.34	21.05	17.67	18.57
Wave 2; Less than a university degree	74.54	74.30	74.53	73.21	75.12	76.43
Wave 2: University degree	25.46	25.70	25.47	26.79	24.88	23.57
Independent variables						
Average grade in the last school report						
Overall mean	2.89	2.82	2.94	2.91	3.00	2.88
SD (overall)	0.71	0.71	0.71	0.73	0.71	0.62
SD (between-individual)	0.65	0.66	0.64	0.67	0.65	0.55
SD (within-individual)	0.28	0.27	0.31	0.29	0.28	0.27
Number of best friends nominated						
Overall mean	3.81	3.84	3.83	3.79	3.73	3.90
SD (overall)	1.34	1.29	1.36	1.36	1.39	1.39
SD (between-individual)	1.11	1.08	1.16	1.18	1.14	1.12
SD (within-individual)	0.74	0.72	0.72	0.66	0.81	0.83
% coethnic (objective) best friends						
Overall mean	39.22	58.78	7.76	16.01	28.24	20.36
SD (overall)	35.71	30.79	15.39	27.01	33.37	27.51
SD (between-individual)	33.64	27.78	13.88	25.24	30.90	25.82
SD (within-individual)	11.99	13.29	6.70	9.71	12.64	9.61
% best friends with whom ego shares objective and subjective ethnicity						
Overall mean	33.55	56.97	3.61	9.59	14.70	11.15
SD (overall)	35.23	31.34	10.00	20.22	24.60	19.19
SD (between-individual)	32.52	27.81	7.61	16.69	19.30	14.72
SD (within-individual)	13.55	14.45	6.50	11.44	15.27	12.34
% best friends with immigrant background						
Overall mean	39.53	48.96	49.48	44.45	38.42	39.60
SD (overall)	33.53	15.38	16.85	16.51	15.08	14.74

TABLE I. Descriptive statistics of time-varying variables

	Total	Native	G3	G2+	G2	G1
SD (between-individual)	30.80	13.81	15.04	14.67	12.87	12.78
SD (within-individual)	13.25	6.78	7.63	7.60	7.86	7.38
Parents' ISEI of best friends						
Overall mean	45.55	48.96	49.47	44.45	38.42	39.60
SD (overall)	16.22	15.38	16.85	16.51	15.08	14.74
SD (between-individual)	14.51	13.81	15.05	14.67	12.87	12.78
SD (within-individual)	7.25	6.78	7.63	7.60	7.86	7.38
% best friends whose parents have university education						
Overall mean	20.06	21.89	22.22	18.44	16.78	16.64
SD (overall)	24.73	25.72	25.70	25.53	21.70	22.21
SD (between-individual)	22.46	23.57	23.61	23.53	18.91	19.68
SD (within-individual)	10.34	10.31	10.21	9.99	10.66	10.36
N individuals	1956	965	212	209	430	140
N individuals x wave	3912	1930	424	418	860	280

Percentages and means and standard deviations (in parentheses). Unweighted results and sample sizes. Source: own elaboration based on the German sample of CILS4EU, waves 1 and 2.

TABLE 2. Descriptive statistics of time-constant variables

	Total	Native	G3	G2+	G2	G1
Independent variables						
Migrant background						
Native	49.34	n.a.	n.a.	n.a.	n.a.	n.a.
G3	10.84	n.a.	n.a.	n.a.	n.a.	n.a.
G2+	10.69	n.a.	n.a.	n.a.	n.a.	n.a.
G2	21.98	n.a.	n.a.	n.a.	n.a.	n.a.
G1	7.16	n.a.	n.a.	n.a.	n.a.	n.a.
Country of origin/objective ethnicity						
Germany	49.34	100	0.00	0.00	0.00	0.00
Turkey	14.21	0.00	3.77	21.53	46.51	17.86
Former Soviet Union (FSU)	6.03	0.00	3.30	3.83	11.40	38.57
Poland	5.67	0.00	22.17	8.61	8.60	6.43
Former Yugoslavia	3.48	0.00	3.30	5.26	9.53	6.43
Other minorities	21.27	0.00	67.45	60.77	23.95	30.71
School type						
<i>Hauptschule</i>	18.56	12.75	12.74	21.05	29.77	29.29
<i>Realschule</i>	32.57	35.54	29.72	28.23	31.16	27.14
<i>Gymnasium</i>	21.01	24.46	26.89	22.01	13.02	11.43
Schools combining several tracks	27.66	27.15	30.19	28.71	25.58	32.14
Parents' highest ISEI	46.78 (20.51)	51.29 (19.87)	50.53 (20.08)	46.60 (19.96)	36.53 (17.68)	41.71 (22.10)
Parents' education						
Uncompleted primary	1.53	0.52	1.42	0.48	4.42	1.43
Primary education	6.19	1.66	1.42	4.78	17.44	12.14
Secondary education	70.81	76.27	76.42	69.38	63.49	49.29
Tertiary education	20.40	21.14	19.81	25.36	12.09	34.29
Unknown	1.07	0.41	0.94	0.00	2.56	2.86
N individuals	1956	965	212	209	430	140
N individuals x wave	3912	1930	424	418	860	280

Percentages and means and standard deviations (in parentheses). Unweighted results and sample sizes. Source: own elaboration based on the German sample of CILS4EU, waves 1 and 2.

TABLE 3. Results from random effects between-within (REWB) longitudinal logistic regressions of the effect of selected variables on the likelihood of expecting a university diploma

	Model 1	Model 2	Model 3	Model 4	Model 5a	Model 5b	Model 6a	Model 6b	Model 7a	Model 7b
Migrant background										
Native	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
3G	1.04 [0.53,2.02]	1.22 [0.62,2.40]	1.97+ [0.97,4.01]	2.09+ [0.90,4.86]	1.51 [0.56,4.07]	1.65 [0.72,3.75]	1.67 [0.58,4.81]	1.67 [0.74,3.80]	2.45 [0.65,9.23]	1.67 [0.73,3.79]
2G+	1.29 [0.65,2.55]	1.84+ [0.97,3.48]	2.00* [1.04,3.84]	2.12+ [0.96,4.68]	1.12 [0.41,3.00]	2.44* [1.14,5.22]	1.2 [0.42,3.41]	2.24* [1.05,4.74]	1.49 [0.38,5.76]	2.27* [1.07,4.82]
2G	0.87 [0.53,1.45]	4.65*** [2.66,8.13]	5.28*** [2.60,10.74]	5.58*** [2.41,12.92]	1.93 [0.76,4.90]	5.80*** [3.00,11.19]	2 [0.77,5.20]	4.62*** [2.39,8.93]	0.99 [0.26,3.81]	4.66*** [2.40,9.04]
1G	0.9 [0.42,1.91]	2.19* [1.03,4.66]	3.82** [1.61,9.05]	4.04** [1.56,10.47]	2.14 [0.70,6.55]	2.84* [1.22,6.60]	2.17 [0.70,6.69]	2.23+ [0.94,5.29]	1.97 [0.30,12.82]	2.24+ [0.94,5.33]
Grade in last school report										
Between effect		0.09*** [0.06,0.14]	0.09*** [0.06,0.13]	0.09*** [0.06,0.13]	0.08*** [0.05,0.12]	0.09*** [0.06,0.13]	0.08*** [0.05,0.12]	0.09*** [0.06,0.13]	0.09*** [0.06,0.13]	0.09*** [0.06,0.13]
Within effect		2.71*** [1.74,4.23]	2.74*** [1.75,4.29]	2.71*** [1.73,4.24]	2.72*** [1.74,4.25]	2.75*** [1.76,4.29]	2.73*** [1.74,4.26]	2.74*** [1.76,4.27]	2.74*** [1.75,4.28]	2.67*** [1.70,4.19]
School type										
<i>Hauptschule</i>		Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>Realschule</i>		4.58*** [2.19,9.58]	4.92*** [2.36,10.27]	4.94*** [2.37,10.32]	5.73*** [2.74,12.00]	4.82*** [2.28,10.22]	5.82*** [2.78,12.19]	5.32*** [2.51,11.26]	5.04*** [2.40,10.58]	5.35*** [2.52,11.36]
<i>Gymnasium</i>		125.00*** [53.05,294.56]	131.94*** [56.08,310.42]	133.32*** [56.64,313.83]	159.84*** [66.46,384.39]	138.89*** [57.63,334.76]	164.22*** [67.83,397.59]	154.85*** [63.67,376.60]	156.28*** [64.34,379.59]	157.24*** [64.47,383.59]
Schools combining several tracks		4.66*** [2.28,9.50]	4.59*** [2.26,9.35]	4.62*** [2.27,9.40]	5.31*** [2.59,10.90]	4.91*** [2.36,10.20]	5.40*** [2.63,11.09]	5.24*** [2.53,10.88]	4.97*** [2.41,10.27]	5.27*** [2.53,10.95]
Parents' highest ISEI										
		1.01+ [1.00,1.02]	1.01* [1.00,1.02]	1.01* [1.00,1.02]	1.01 [1.00,1.02]	1.01* [1.00,1.02]	1.01* [1.00,1.02]	1.01* [1.00,1.02]	1.01* [1.00,1.02]	1.01* [1.00,1.02]
Parents' education										
Uncompleted primary		Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Primary education		1.37 [0.17,10.96]	1.75 [0.21,14.22]	1.76 [0.22,14.29]	1.49 [0.20,10.95]	1.37 [0.17,10.96]	1.45 [0.20,10.65]	1.32 [0.17,10.23]	1.27 [0.17, 9.32]	1.32 [0.17, 10.30]
Secondary education		0.92 [0.14,6.26]	1.45 [0.21,10.11]	1.47 [0.21,10.18]	1.06 [0.17,6.55]	0.96 [0.14,6.45]	1.04 [0.17,6.44]	0.96 [0.15,6.27]	0.95 [0.15, 5.94]	0.96 [0.15, 6.31]

TABLE 3. Results from random effects between-within (REWB) longitudinal logistic regressions of the effect of selected variables on the likelihood of expecting a university diploma

	Model 1	Model 2	Model 3	Model 4	Model 5a	Model 5b	Model 6a	Model 6b	Model 7a	Model 7b
Tertiary education		8.11*	12.70*	12.85*	9.67*	8.63*	9.47*	8.48*	7.87	8.56
		[1.13,57.97]	[1.73,93.53]	[1.75,94.39]	[1.47,63.41]	[1.21,61.49]	[1.45,61.99]	[1.23,58.75]	[1.20, 51.67]	[1.23, 59.52]
Unknown		0.76	0.86	0.88	0.86	0.77	0.84	0.76	0.72	0.77
		[0.03,17.98]	[0.04,19.50]	[0.04,19.97]	[0.03,21.35]	[0.03,18.82]	[0.03,20.76]	[0.03,18.23]	[0.03, 17.51]	[0.03,19.10]
Sex										
Female		Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Male		0.70+	0.70+	0.70+	0.67*	0.68+	0.66*	0.68+	0.68+	0.67+
		[0.47,1.04]	[0.47,1.04]	[0.47,1.03]	[0.44,1.00]	[0.45,1.02]	[0.44,1.00]	[0.45,1.02]	[0.45,1.01]	[0.45,1.01]
Ethnic background										
German			Ref.	Ref.						
Turkish			1.98+	1.91+						
			[0.97,4.08]	[0.89,4.12]						
FSU			0.29**	0.28**						
			[0.11,0.72]	[0.11,0.72]						
Poland			0.12***	0.12***						
			[0.05,0.34]	[0.05,0.34]						
Former Yugoslavia			0.33+	0.33+						
			[0.10,1.11]	[0.10,1.12]						
% coethnic objective best friends										
Between effect				1.00	1.00	1.01	0.997	1.01	1.00	1.01
				[0.99,1.01]	[0.98,1.01]	[1.00,1.01]	[0.98,1.01]	[1.00,1.01]	[0.99,1.01]	[1.00,1.01]
Within effect				1.01	1.00	1.00	1.01	1.00	1.01	1.01
				[0.99,1.02]	[0.99,1.02]	[0.99,1.01]	[0.99,1.02]	[0.99,1.02]	[0.99,1.02]	[0.99,1.02]
Number of best friends nominated										
Between effect					1.02	0.99	1.02	0.97	0.99	0.97
					[0.86,1.23]	[0.83,1.19]	[0.85,1.22]	[0.81,1.17]	0.83,1.19]	[0.81,1.17]
Within effect					1.26**	1.26*	1.25*	1.26*	1.26*	1.26**
					[1.06,1.50]	[1.06,1.49]	[1.05,1.49]	[1.05,1.50]	[1.05,1.50]	[1.06,1.51]
Migrant background x % objectively coethnic best friends (between effect)										
Native					Ref.		Ref.			
3G					0.93*		0.93*			
					[0.88,0.99]		[0.88,0.98]			

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	Model 1	Model 2	Model 3	Model 4	Model 5a	Model 5b	Model 6a	Model 6b	Model 7a	Model 7b
2G+					1.03*		1.02			
					[1.00,1.05]		[0.99,1.05]			
2G					1.03**		1.03*			
					[1.01,1.05]		[1.00,1.05]			
1G					0.995		0.99			
					[0.97,1.02]		[0.96,1.02]			
Migrant background x % objectively coethnic best friends (within effect)										
Native						Ref.		Ref.		
3G						1.04		1.04		
						[0.98,1.12]		[0.98,1.12]		
2G+						1.02		1.02		
						[0.97,1.07]		[0.97,1.07]		
2G						1.01		1.01		
						[0.98,1.04]		[0.98,1.04]		
1G						0.995		0.995		
						[0.94,1.05]		[0.94,1.05]		
% friends with immigrant origins										
Between effect							1.00	1.01+	1.00	1.01+
							[0.99,1.01]	[1.00,1.02]	[0.98,1.01]	[1.00,1.02]
Within effect							1.00	1.00	1.00	1.00
							[0.99,1.01]	[0.99,1.01]	[0.99,1.01]	[0.98,1.02]
Migrant background x % friends with immigrant origins (between effect)										
Native									Ref.	
3G									0.98	
									[0.94,1.01]	
2G+									1.01	
									[0.98,1.03]	
2G									1.03*	
									[1.00,1.05]	

TABLE 3. Results from random effects between-within (REWB) longitudinal logistic regressions of the effect of selected variables on the likelihood of expecting a university diploma

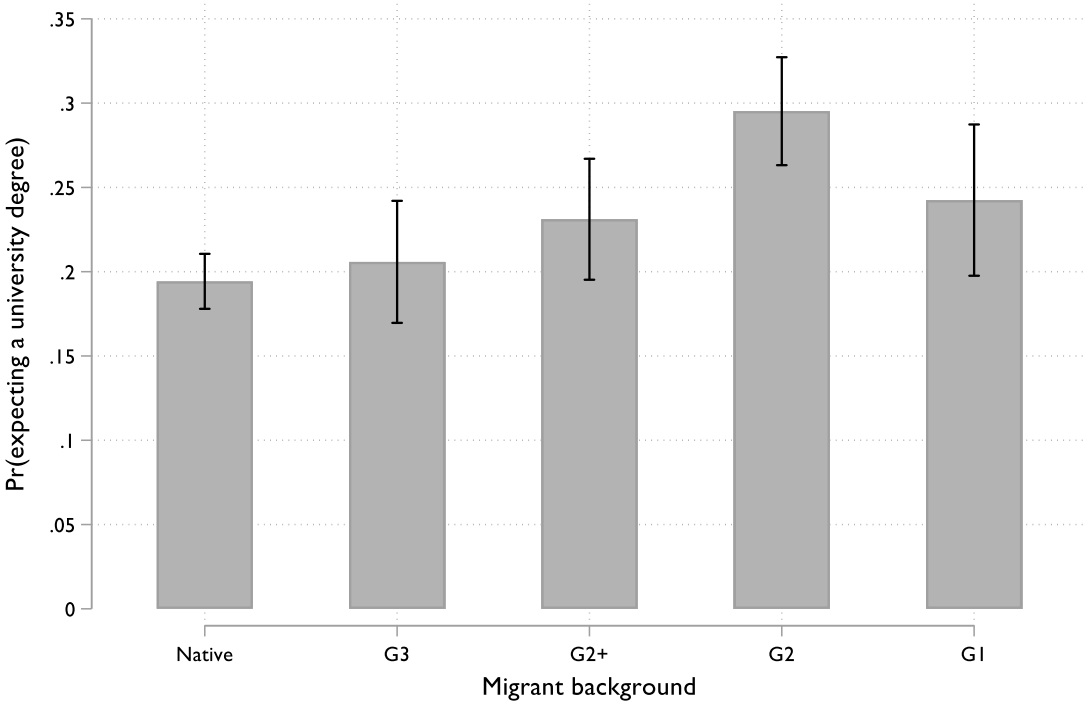
	Model 1	Model 2	Model 3	Model 4	Model 5a	Model 5b	Model 6a	Model 6b	Model 7a	Model 7b
IG									1.00	
									[0.98,1.03]	
Migrant background x % friends with immigrant origins (within effect)										
Native										Ref.
3G										1.03
										[0.99,1.07]
2G+										0.99
										[0.96,1.03]
2G										1.00
										[0.97,1.03]
1G										0.99
										[0.95,1.02]
N observations (individuals x wave)	3912	3904	3904	3904	3904	3904	3904	3904	3904	3904
N groups (individuals)	1956	1952	1952	1952	1952	1952	1952	1952	1952	1952
AIC	3471	2634	2606	2609	2620	2638	2623	2638	2628	2636
BIC	3509	2741	2738	2753	2777	2794	2792	2808	2797	2806
Log pseudolikelihood	-1730	-1300	-1282	-1282	-1285	-1294	-1285	-1292	-1287	-1291
Wald Chi2	1.12	260.48***	261.13***	261.95	264.08	264.28***	265.03	265.5	262.99	262.20

Exponentiated coefficients (odds ratios); 95% confidence intervals in brackets. Unweighted results. Robust standard errors at the individual level.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Source: own elaboration based on the German sample of CILS4EU, waves 1 and 2.

FIGURE I. Predicted probabilities of expecting a university degree (Model 2)



Nota: controls for school grades, school type, family ISEI, parents' education and sex of respondent

FIGURE 2. Predicted probabilities of expecting a university diploma at different percentages of objectively co-ethnic friends among reported best friends in the classroom (Models 5a and 5b)

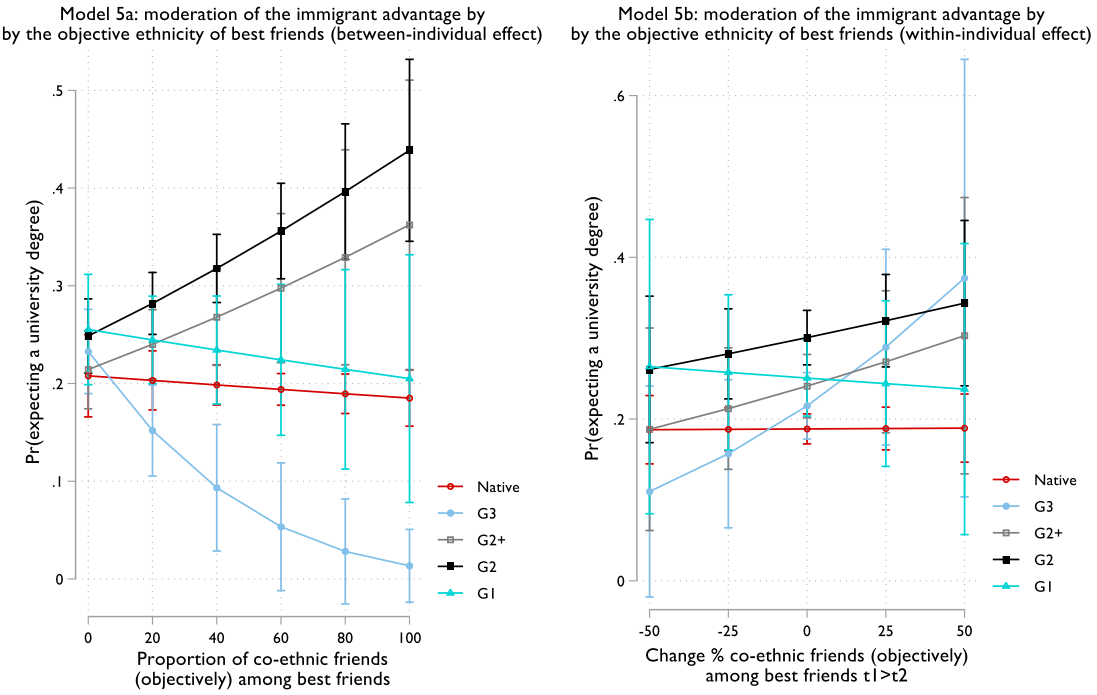


FIGURE 3. Predicted probabilities of expecting a university diploma at different percentages of immigrant-origin friends among reported best friends in the classroom (Models 7a and 7b)

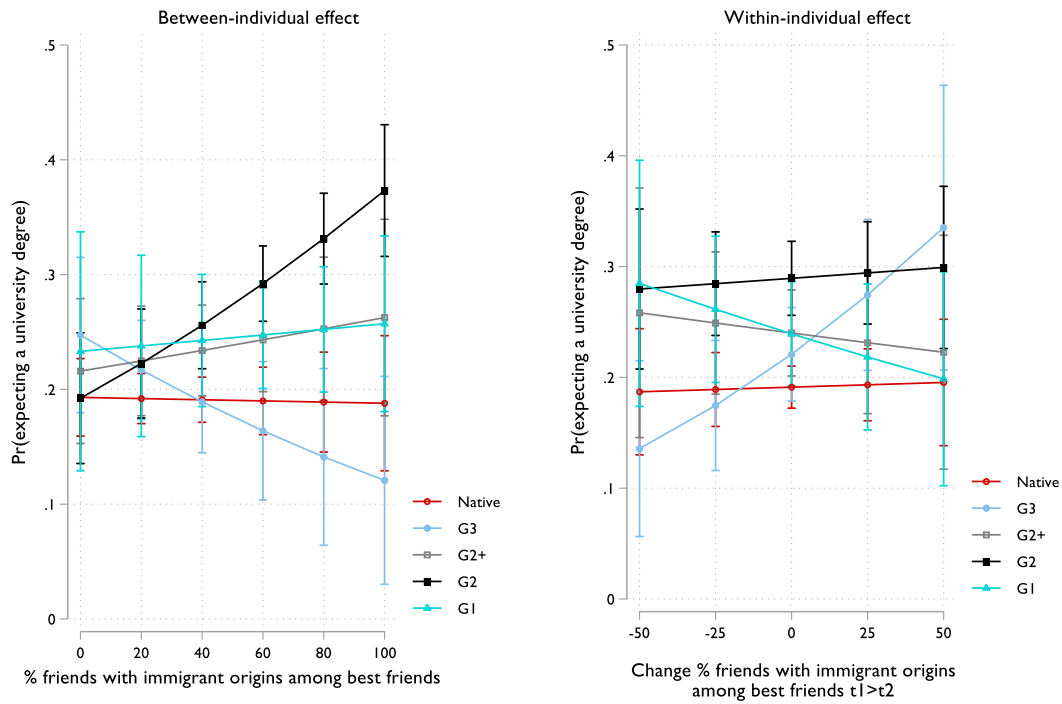


TABLE 4. Results from random effects between-within (REWB) longitudinal logistic regressions of the effect of selected variables on the likelihood of expecting a university diploma for respondents with different percentage of friends with whom the ego shares objective and subjective ethnicity

	Model 8a <50 % friends with ego-friends shared objective and subjective ethnicity Between individuals	Model 8b >50% friends with ego-friends shared objective and subjective ethnicity Between individuals	Model 8c <50 % friends with ego-friends shared objective and subjective ethnicity Within individuals	Model 8d >50% friends with ego-friends shared objective and subjective ethnicity Within individuals
Migrant background				
Native	Ref.	Ref.	Ref.	Ref.
G2	1.11 [0.33,3.79]	5.10 [0.01,2631.56]	3.89*** [1.81,8.38]	14.87* [1.36,162.72]
% co-ethnic objective best friends				
Between effect	0.98 [0.95,1.01]	1.01 [0.99,1.04]	1.01 [1.00,1.02]	1.01 [0.99,1.04]
Within effect	1.01 [0.99,1.03]	1.01 [0.99,1.03]	1.02+ [1.00,1.05]	1.00 [0.97,1.02]
Migrant background x % co-ethnic objective best friends (between effect)				
Native	Ref.	Ref.		
G2	1.05* [1.01,1.09]	1.01 [0.93,1.10]		
Migrant background x % co-ethnic objective best friends within effect)				
Native			0.98	1.04
G2			[0.94,1.02]	[0.97,1.10]
N observations (ind. x wave)	2550	1352	2550	1350
N groups (individuals)	1275	676	1275	675
AIC	1679	949	1694	949
BIC	1843	1079	1858	1074
Log pseudolikelihood	-811	-450	-819	-451
Wald Chi2	-811.44769	-449.57629	-819.04722	-450.59039

All models control for school grades, type of school, parental ISEI, parental education, sex, number of nominated best friends, percentage of nominated best friends with immigrant origin, average ISEI of nominated best friends and percentage of nominated best friends with university-educated parents. Exponentiated coefficients (odds ratios); 95% confidence intervals in brackets.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

Source: own elaboration based on the German sample of CILS4EU, waves 1 and 2.

FIGURE 4. Predicted probabilities of expecting a university diploma at different percentages of objectively co-ethnic friends among reported best friends in the classroom for respondents with less than 50% of best friends with whom they share objective and subjective ethnicity (left graph) and for respondents with 50% or more best friends with whom they share objective and subjective ethnicity (right graph). Between-individual variation

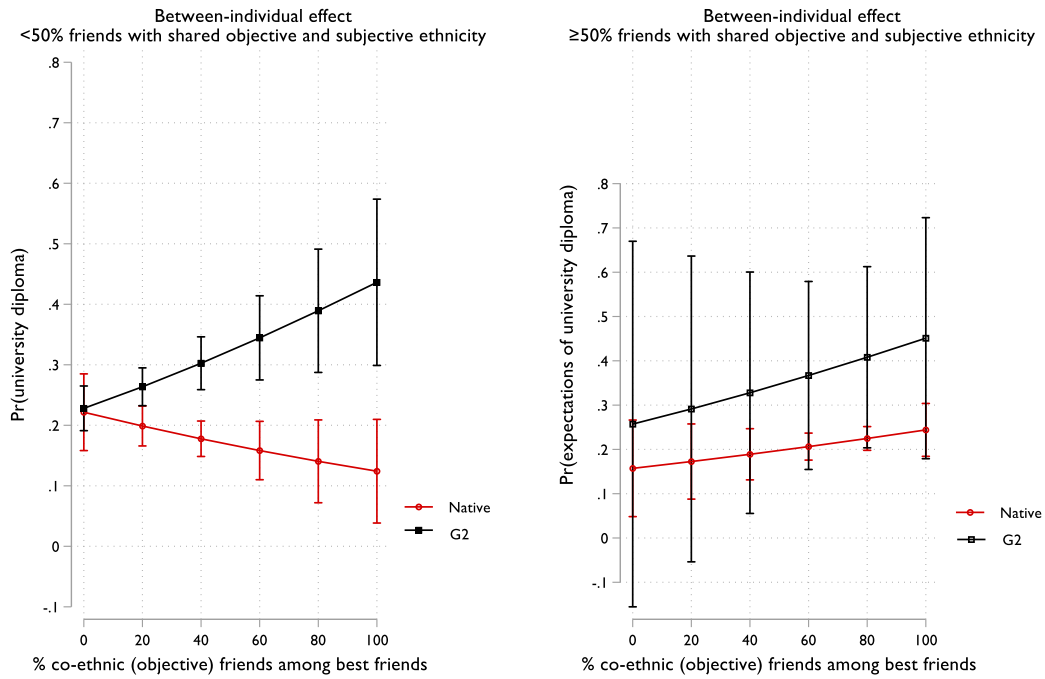
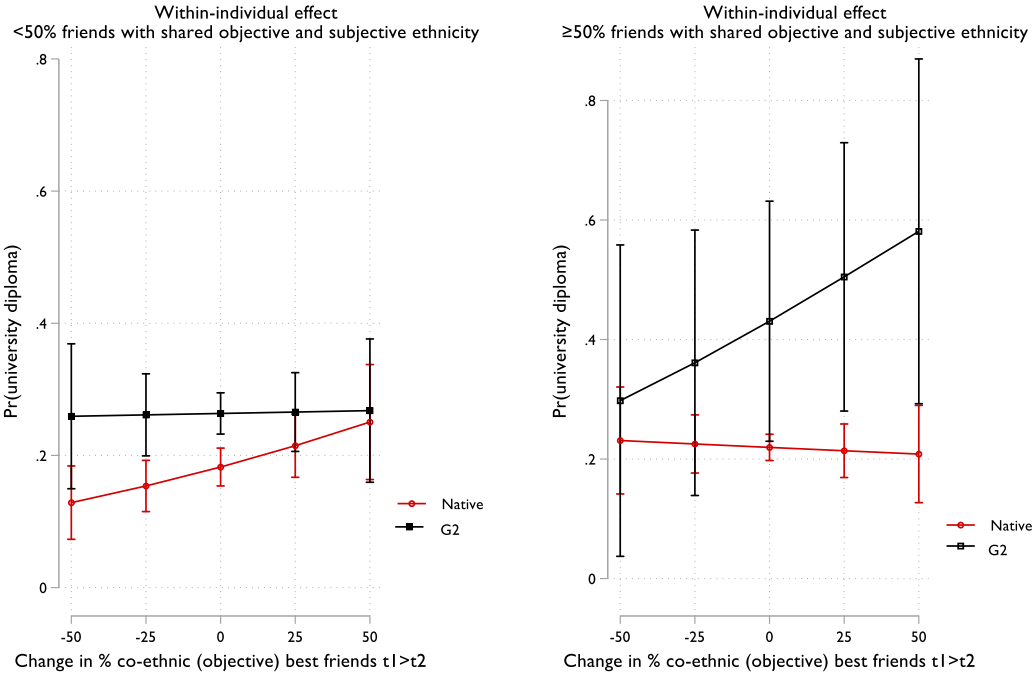


FIGURE 5. Predicted probabilities of expecting a university diploma at different levels of change in the percentage of objectively co-ethnic friends among reported best friends in the classroom for respondents with less than 50% of best friends with whom they share objective and subjective ethnicity (left graph) and for respondents with 50% or more best friends with whom they share objective and subjective ethnicity (right graph). Within-individual variation



Appendix

FIGURE A1. Main effect of the between-individual (left) and the within-individual (right) variation in the percentage of objectively co-ethnic friends (Model 4)

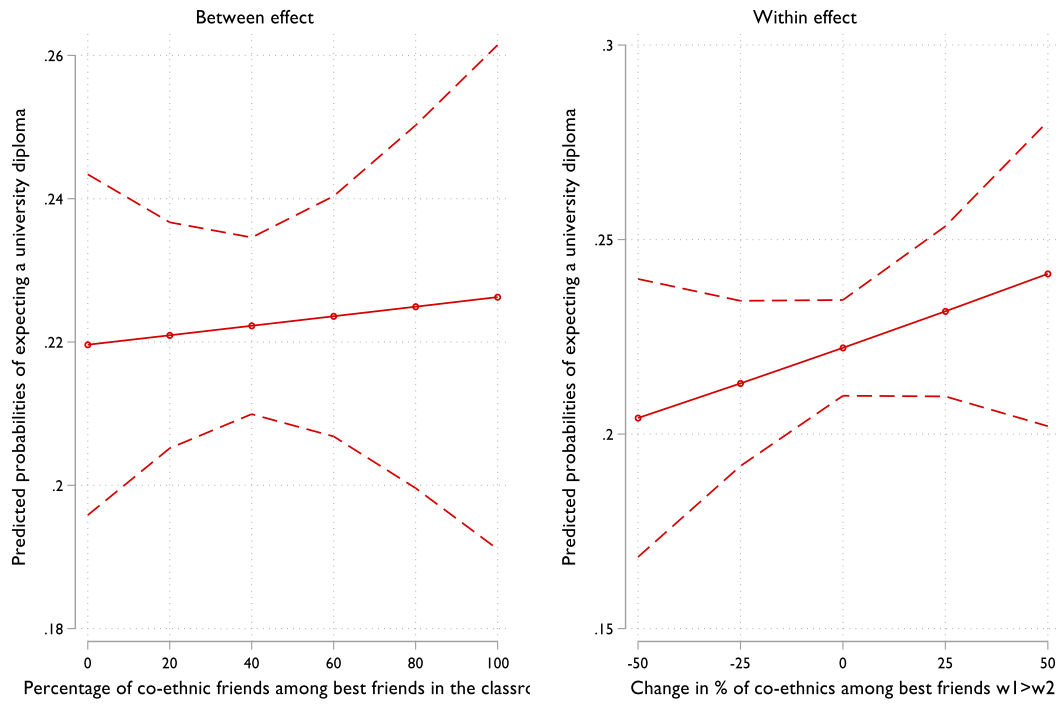


FIGURE A2. Predicted probabilities of expecting a university diploma at different percentages of objectively co-ethnic friends among reported best friends in the classroom (between-individual variation)

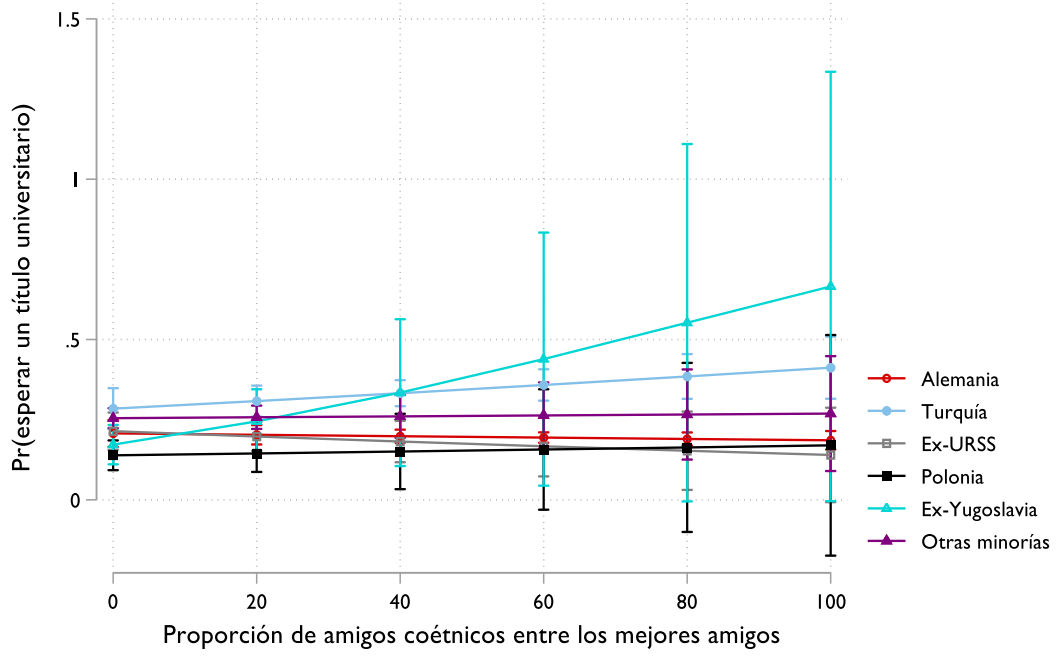


TABLE A1. Average marginal effects of generation of immigration (vs. natives) at different percentages of co-ethnic friends among nominated best friends without controlling and controlling for the percentage of best friends with immigrant origins. **Between-individual variation**

	Without controlling for % of friends with immigrant origins		Controlling for % of friends with immigrant origins		Diff A-B
	AME (A)	SE	AME (B)	SE.	
Generation 3					
0%	0.025	0.03	0.025	0.03	0.000
20%	-0.051	0.03	-0.053	0.03	0.001
40%	-0.105	0.03	-0.107	0.03	0.002
60%	-0.141	0.03	-0.142	0.03	0.002
80%	-0.161	0.03	-0.163	0.03	0.002
100%	-0.172	0.02	-0.173	0.02	0.001
Generation 2+					
0%	0.006	0.03	0.01	0.03	-0.002
20%	0.037	0.02	0.04	0.02	-0.002
40%	0.069	0.03	0.07	0.03	-0.002
60%	0.104	0.04	0.11	0.04	-0.002
80%	0.140	0.06	0.14	0.06	-0.002
100%	0.177	0.08	0.18	0.09	-0.002
Generation 2					
0%	0.041	0.03	0.042	0.03	-0.001
20%	0.079	0.02	0.080	0.02	-0.001
40%	0.119	0.02	0.120	0.02	-0.001
60%	0.162	0.03	0.163	0.03	-0.001
80%	0.207	0.04	0.207	0.05	0.000
100%	0.254	0.05	0.254	0.06	0.000
Generation 1					
0%	0.047	0.04	0.048	0.04	-0.001
20%	0.041	0.03	0.044	0.03	-0.002
40%	0.036	0.03	0.039	0.03	-0.004
60%	0.030	0.04	0.035	0.04	-0.005
80%	0.025	0.05	0.031	0.06	-0.006
100%	0.020	0.07	0.027	0.07	-0.007

Source: own elaboration based on the German sample of CILS4EU, waves 1 and 2.

TABLE A2. Average marginal effects of generation of immigration (vs. natives) at different levels of change in the percentage of co-ethnic friends among nominated best friends without controlling and controlling for the percentage of best friends with immigrant origins. **Within-individual variation**

	Without controlling for % of friends with immigrant origins		Controlling for % of friends with immigrant origins		Diff A-B
	AME (A)	SE	AME (B)	SE.	
Generation 3					
-50%	-0.08	0.07	-0.08	0.07	-0.001
-25%	-0.03	0.05	-0.03	0.05	-0.001
0%	0.03	0.02	0.03	0.02	-0.001
25%	0.10	0.06	0.10	0.06	-0.001
50%	0.19	0.14	0.19	0.14	0.000
Generation 2+					
-50%	0.00	0.07	0.00	0.07	0.004
-25%	0.03	0.04	0.02	0.04	0.004
0%	0.05	0.02	0.05	0.02	0.005
25%	0.08	0.05	0.08	0.05	0.005
50%	0.11	0.09	0.11	0.09	0.006
Generation 2					
-50%	0.07	0.05	0.06	0.06	0.013
-25%	0.09	0.03	0.08	0.03	0.014
0%	0.11	0.02	0.10	0.02	0.015
25%	0.13	0.03	0.12	0.04	0.016
50%	0.15	0.06	0.14	0.06	0.017
Generation 1					
-50%	0.08	0.10	0.06	0.09	0.02
-25%	0.07	0.05	0.06	0.05	0.01
0%	0.06	0.03	0.05	0.03	0.01
25%	0.06	0.05	0.04	0.05	0.01
50%	0.05	0.09	0.03	0.09	0.01

Source: own elaboration based on the German sample of CILS4EU, waves 1 and 2.

TABLE A3. Ratio of the probability of expecting a university degree of G2 vs natives at different percentages of objectively co-ethnic peers for individuals who share objective and subjective ethnicity with less than 50% (<50 %) and with more than 50% of their best friends (≥50%)

% objectively co-ethnic friends among best friends	Between effects		Change % objectively co-ethnic friends among best friends $t_1 > t_2$	Within effects	
	Ratio of the probability G2 vs natives			Ratio of the probability G2 vs natives	
	<50 %	≥50%		<50 %	≥50%
0	1.03	1.64	-50	2,02	1,29
20	1.33	1.69	-25	1,70	1,60
40	1.70	1.73	0	1,44	1,96
60	2.18	1.78	+25	1,24	2,36
80	2.77	1.82	+50	1,07	2,79
100	3.51	1.85			