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Secondary Ethnic Effects in the Transition to Higher Education in Germany and Their Explanations

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Abstract
Given their lower socioeconomic background and achievement, immigrants and their descendants have been shown to make more ambitious decisions regarding educational transitions. While previous research has extensively analysed transitions within and after compulsory education, research on late transitions is scarce. This study focuses on the secondary effect of ethnic origin in the transition after upper secondary education in Germany, where school leavers decide between vocational education and training and higher education. Based on longitudinal data from the National Educational Panel Study, we first analyse differences by ethnic origin (Turkey, former Soviet Union, Poland, other countries) and immigrant generation (first, second, third generation) net of socioeconomic background and achievement. Compared to those of the ethnic majority, we find increased probabilities of enrolment in higher education for most ethnic groups of the first and second immigrant generation, net of differences in socioeconomic background and achievement. Second, we test four explanatory approaches for secondary ethnic effects (immigrant optimism, relative status maintenance, anticipated discrimination, and information deficits). By employing decomposition analyses for nonlinear regression models, we find that, taken together, the four explanations account for up to half of the ethnic differences in educational choice after upper secondary education. Specifically, increased levels of immigrant optimism and information deficits regarding vocational education explain a substantial share of the ethnic differences among all origin groups. For Turkish immigrants, the motive to maintain relative status in the origin country also contributes to increased enrolment rates in higher education.

Keywords Higher education · Enrolment · Ethnic inequalities · Secondary effects · Effect decomposition

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Introduction

Ethnic educational inequality research has shown that immigrants and their descendants are often disadvantaged in the educational system. These findings can be seen in a wide variety of national contexts (Heath et al., 2008) and generally relate to performance and school-leaving qualifications but often also to participation in the education system in general. However, immigrants and their descendants choose academic alternatives more often than natives at various educational transitions in light of their comparatively low socioeconomic background and achievement (Dollmann, 2017). This so-called positive secondary ethnic effect[1] might lead to a compensation for ethnic disadvantages in terms of educational success in the medium term.

Research has shown that, consistent with secondary ethnic effects, immigrants and their descendants have relatively high educational aspirations and expectations compared to families without migration experience (Becker & Gresch, 2016; Hao & Bonstead-Bruns, 1998). High educational aspirations and expectations are associated with various educational transitions and at least partly explain immigrants' increased transition rates (Dollmann, 2017; Glick & White, 2004; Kristen & Dollmann, 2010). Another strand of related research has examined the concrete mechanisms associated with the situation of immigrants and their descendants (e.g., immigrant optimism) and examined the explanatory power of these mechanisms for increased aspirations and expectations among immigrants (Hadjar & Scharf, 2019; Salikutluk, 2016; Tjaden & Hunkler, 2017). However, the empirical evidence has not shown a uniform picture, which is not least due to differences or incomplete operationalizations of the relevant mechanisms. Additionally, it is not yet clear to what extent the concrete mechanisms of increased aspirations and expectations affect the educational transitions that are ultimately realized. Educational aspirations and expectations, while understood as predictions or anticipations of the transition decision (Kleine et al., 2010), may deviate from actual educational transitions for a variety of reasons. On the one hand, aspirations and expectations might change in light of new information. On the other hand, students may not be able to realize the transitions they originally sought (Roderick et al., 2011), for example, because they do not meet admission requirements or because they encounter other structural barriers. Another limitation of previous research on increased ethnic aspirations and expectations concerns the specific educational transitions studied. Most related studies have focused on educational transitions within compulsory education or transitions from school to vocational education and training (VET). Only a few authors have addressed ethnic differences at the transition to higher education (HE) (Blake & Langenkamp, 2022; Jackson, 2012; Kristen et al., 2008; Tong & Harris, 2021) or within HE (Kirui & Kao, 2018; Neumeyer & Pietrzyk, 2019, 2023; Tienda & Zhao, 2017; Wakeling & Laurison, 2017). However, HE is increasingly important for the attainment of high socioeconomic positions in Western societies.

Taken together, these research gaps give rise to the following two research questions that we address in this article: Are there ethnic differences in educational decision-making at the transition to HE? What role do aspirations and expectations and their underlying mechanisms play in the emergence of ethnic differences in the transition to HE?

[1] Note that despite its causal connotation, the term 'secondary ethnic effects' strictly refers to descriptive differences in educational transitions net of socioeconomic background and achievement. For the sake of consistency, we adopt this term from previous research.

To answer these questions, we examine the educational transitions of upper secondary school leavers in Germany. The transition to the German HE system seems to us to be particularly well suited to answering our research questions. On the one hand, students meet comparatively few restrictions on access to universities once they obtain a higher education entry qualification. The majority of bachelor's programmes in Germany have no admission restrictions (Hochschulrektorenkonferenz, 2020, p. 21). Therefore, if graduates from upper secondary schools are flexible in their choice of field or institution, they can circumvent achievement restrictions. This situation is in contrast to, for example, the situation in the U.S. or UK, where there is stronger selectivity by institutions. On the other hand, there are no tuition fees in Germany, a relatively small private sector of HE, or funding possibilities for students from low-income families (according to the Federal Training Assistance Act). For a first degree at a German university, semester fees are required, but these fees are usually well below 500 euros per semester and often include a ticket for public transport. Accordingly, students pay only a negligible fraction of tuition fees compared to studying at a public university in the U.S. or UK (Garritzmann, 2016). Thus, it can be assumed that high aspirations and expectations are of particular importance for the decision to study in Germany. However, there are alternative educational paths in Germany that also enable access to prestigious professions and high labour market returns. In Germany, there is a relatively well-developed system of VET in which various professions can be learned in the so-called dual system or at vocational schools (similar to Austria and Switzerland). The professional qualifications obtained there are perceived as relatively viable alternatives to HE, which is not the case in other countries without comparable VET programmes (e.g., the US). Therefore, a sufficiently large group of individuals with a higher education entry qualification (HEEQ) is taking educational paths other than HE after upper secondary education.

This article contributes to the state of related research in three ways. First, by analysing the transition to HE, we focus on a transition that is rarely analysed in research on the educational trajectories of immigrants. Second, we replicate existing analyses on the transition of immigrant students to HE compared to that of natives with more recent, large panel data in Germany. In our analyses, we distinguish specific groups of immigrants by their ethnic group and their immigrant generation. Third, we examine to what extent explanatory approaches that have been developed in the context of high aspirations and expectations of immigrants (for an overview, see Becker & Gresch, 2016) can also contribute to increased probabilities of immigrants enrolling in HE: immigrant optimism, relative status maintenance, anticipated discrimination, and information deficits. We apply decomposition analyses for nonlinear models to quantify the extent to which specific approaches explain ethnic differences.

To answer our research questions, we employ data from the National Educational Panel Study (NEPS), starting cohort 4. The NEPS data cover the educational careers of a recent cohort of school leavers who have obtained an HEEQ in Germany. It is possible to distinguish between specific immigrant groups regarding ethnic origin and generational status with this data. Furthermore, the NEPS data allow a more exhaustive test of the different mechanisms of increased aspirations and expectations.

Our article is structured as follows: First, we describe theoretical explanations of ethnic secondary effects. In doing so, we account for migration-specific mechanisms that have been formulated in the context of the formation of high aspirations and expectations of immigrants. Based on these theoretical considerations, we develop our hypotheses and provide an overview of the current state of related research. Where applicable, we derive hypotheses for specific immigrant groups (Sect. 2). In Sect. 3, we describe the data before

we present the results in Sect. 4. In the concluding section, we discuss our results and address their theoretical and practical implications.

Explanations of Secondary Ethnic Effects

Research on ethnic inequalities often draws on the distinction between primary and secondary effects coined by Boudon (1974) (Heath & Brinbaum, 2007). Primary ethnic effects refer to differences in skill levels and school performance between different ethnic groups that persist after controlling for the often less favourable socioeconomic background of different immigrant groups. Typically, primary ethnic effects are negative and often visible in early childhood (Becker & Klein, 2021). Secondary ethnic effects, the focus of this paper, refer to ethnic differences in educational choices that exist after socioeconomic background and ethnic primary effects, i.e., differences in achievement, are accounted for. Research has shown that secondary ethnic effects are positive at various educational transitions and that secondary effects are aligned with increased educational aspirations and expectations of ethnic minorities (Dollmann, 2017; Glick & White, 2004). Aspirations (or idealistic aspirations) and expectations (also called realistic aspirations) (Haller, 1968) reflect different types of goals that are assumed to be important in educational decision-making and that are explained by different theories: Aspirations represent educational wishes independently of the respective actual circumstances. According to the Wisconsin model (Sewell et al., 1969), educational aspirations are shaped by the norms and values of significant others (e.g., parents or peers). In the formation of expectations, however, actors take individual resources (e.g., social and financial capital) and prerequisites (e.g., academic performance) into account. According to rational choice theory, educational expectations are assumed to be based on rational decision-making processes (Breen & Goldthorpe, 1997; Erikson & Jonsson, 1996). Actors compare the costs, benefits, and probabilities of success of different educational alternatives, as well as their utility for intergenerational status maintenance. Theoretically, aspirations and expectations and the underlying considerations for their emergence can be clearly distinguished from one another. Empirically, however, it is difficult to measure the two concepts separately, and it is assumed that aspirations and expectations are strongly interwoven and that both significant others and rational calculations play a role in ethnic minorities' educational decision-making (Busse et al., 2023; Schmaus et al., 2024). In the following, we consider aspirations and expectations since both types can also be relevant for transition decisions and are theoretically associated with secondary ethnic effects (Becker & Gresch, 2016).

The increased aspirations and expectations of ethnic minorities are attributed to various factors. On the one hand, these aspects are directly related to migration itself. On the other hand, these aspects are related to how the situation of immigrants in the county of destination affects their norms and values as well as the parameters of rational decision-making (Becker & Gresch, 2016). Four different immigration-specific lines of theoretical arguments for increased educational aspirations and expectations are distinguished.

Immigrant Optimism

Migrants are assumed to be more positively selected than nonmigrants regarding their motivation and their orientation to strive for upwards mobility (Kao & Tienda, 1995). Education is seen as a central means to achieve this social advancement and is therefore

attributed a high value (Hadjar & Scharf, 2019). It is also assumed that parents pass on their high occupational and educational aspirations to their children (Louie, 2001; Shah et al., 2010), especially since first-generation immigrants are able to realize their goals in their own lives only to a limited extent.

Hypothesis 1 Higher levels of immigrant optimism contribute to increased rates of college enrolment among ethnic minorities. We assume that the immigrant optimism is particularly pronounced for immigrants who migrate for economic reasons. Therefore, it should contribute, at least to some extent, to increased rates of enrolment in HE among all major immigrant groups in Germany.

Relative Status Maintenance

The motive for status maintenance, formulated in the context of socioeconomic inequalities in education (e.g., Breen & Goldthorpe, 1997), should apply equally to families with and without migration experience. However, many immigrants had a higher status within their origin country, e.g., in terms of education (Spörlein & Kristen, 2019). In immigrant families, relative status in the country of origin could serve as a reference point in the formation of aspirations and educational decision-making (Becker & Gresch, 2016; Engzell, 2019).

Hypothesis 2 Higher levels of relative status in the country of origin contribute to increased rates of college enrolment among ethnic minorities. This mechanism should work equally for all immigrant groups, although specific groups may, of course, differ in their educational or occupational selectivity (see Spörlein & Kristen, 2019; Spörlein et al., 2020).

Anticipated Discrimination

In the case of Germany, which has a large share of company-based dual VET, students from ethnic minorities might fear discrimination when they are accessing a VET position, as it is usually the company managers who decide on the hiring process partly on the basis of personal interviews. In contrast, access to HE is granted through a more formalized and less personal process, leaving less room for individual discrimination. If students expect discrimination in access to VET, opportunity costs of longer education ultimately decrease, and students may direct their expectations towards HE (Heath & Brinbaum, 2007). Additionally, in academic labour market segments, less discrimination based on ethnic origin is expected than in labour markets for less qualified employees (Heath et al., 2008; Sue & Okazaki, 2009). If this argument is correct, anticipated discrimination should particularly affect the assessment of the relative returns of VET and HE and thereby influence the educational decision in favour of entry into HE.

Hypothesis 3 Anticipated discrimination in accessing VET and in labour markets for VET graduates contributes to increased college enrolment rates of ethnic minorities. It can be assumed that this mechanism is more relevant for immigrant groups with greater social distance to the majority population and immigrant groups that are visually more recognisable. In Germany, this applies above all to immigrants from Turkey (Hans, 2010).

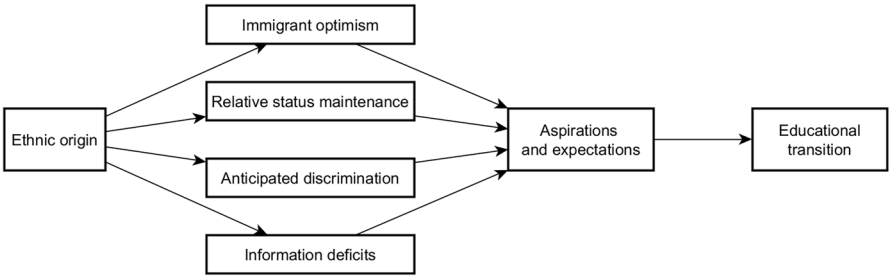

Fig. 1 Theoretical model explaining increased aspirations and expectations and transitions into higher educational tracks of ethnic minorities

Information Deficit

Missing or incorrect information about the education system can lead to distorted assessments of school performance, the necessary requirements and the usability of qualifications in the labour market (Kao & Tienda, 1998; Kristen & Granato, 2007; Ogbu, 1987; Relikowski et al., 2012). This should be reflected in expectations that deviate more from real conditions. Additionally, immigrants might be less familiar with specific educational careers in the host country that are less important in their country of origin. In our application case, this refers in particular to the VET system in Germany, which does not exist in this way in most immigrants' countries of origin. Furthermore, it is assumed that immigrants tend to overestimate the probability of successful completion of a university degree for two reasons. First, they report higher levels of academic self-concept; i.e., they perceive their own academic abilities as higher than majority students with similar grades (Kao & Tienda, 1998; Ogbu, 1987; Siegert & Roth, 2020) on the basis of comparisons within their ethnic group. Second, they assign less importance to performance per se and, instead, put more emphasis on motivational factors (Relikowski et al., 2012).

Hypothesis 4 Lower familiarity with VET and high academic self-concepts contribute to increased rates of college enrolment among ethnic minorities. In particular, immigrants who come from countries where there is no established vocational training system should be less familiar with VET. In Germany, this applies primarily to immigrants from Turkey. We also expect that information deficits diminish over the course of generations. In particular, for third-generation immigrants whose parents have already completed the education system in the host country, information deficits should be negligible.

Figure 1 summarizes the assumed general explanations of ethnic differences in educational transitions. Furthermore, we expect the explanatory factors to have an indirect effect on educational decisions, mediated by aspirations and expectations. In the present study, we focus on the overall influences of the four explanatory mechanisms for two reasons. First, they are more informative and differentiated regarding the underlying factors of differences in educational decisions. Second, it is theoretically expected that their influences on transition behaviour are largely mediated by aspirations and expectations. However, we exploit aspirations and expectations as a *benchmark* of the four explanatory mechanisms. This allows us to assess whether the four mechanisms exhaustively account for the explanatory value of aspirations and expectations for ethnic differences in the postsecondary

transition. If this is not the case, other unobserved mechanisms might play a role in the formation of high educational aspirations and expectations of immigrant students.

Some studies[2] are already available on the individual arguments to explain the high aspirations and expectations of immigrants, although it is difficult to compare these studies due to the different operationalizations of the central explanatory variables. Research that analyses different arguments at the same time has been the exception thus far (Salikutluk, 2016). In the context of the transition to HE, research has provided initial indications of the importance of some of these factors. Mantovani et al. (2018) examined the intention to study and showed that parents' expectations, social capital and attitudes towards the costs and benefits of university education, in particular, help explain ethnic differences. Goyette and Xie (1999) also found a positive effect of parental expectations on children's self-estimated expectations of successfully completing college. Kristen et al. (2008) largely considered the actual transition to university; only for students who had not yet completed the transition study intentions were analysed. They showed that ethnic differences in the transition to university can partly be attributed to motives (preference for academic versus practical work) and information deficits (lower familiarity with the VET system). These results were largely confirmed in the replication of Mentges (2019). Busse and Scharenberg (2022) reported that immigrants' higher enrolment rates in HE and lower enrolment rates in VET can be explained partly by aspirations of students and their parents. Tong and Harris (2021) studied the educational selectivity of Asian parents in the U.S., i.e., relative education compared to the level of education in their countries of origin. Relative education helped explain increased rates of HE enrolment among Asian students. Alvarado (2021) showed—also in the U.S. context—that the aspirations of peers also increase the likelihood of transitioning to university.

Overall, some studies have examined the positive ethnic effects in the transition to university. However, the available studies test only individual theoretical approaches and therefore do not allow comparative conclusions about their relevance. Furthermore, some studies suffer from methodological shortcomings (e.g., a consideration of study intentions alone or in combination with actual transitions or an operationalization of immigrants and their descendants via nationality). A differentiated analysis of various factors that can explain migration-specific differences in the transition to university is therefore still lacking.

Methods

Data

We studied postsecondary educational transitions based on the National Educational Panel Study (NEPS), a large-scale multi-cohort panel study of educational trajectories (Blossfeld & Roßbach, 2019). We focused on Starting Cohort 4, a sample of Grade 9 students in the

[2] We assume that the aforementioned mechanisms apply largely independently of the countries of origin and receiving, provided that immigrants are not per se excluded from access to university. We therefore consider in the state of research not only studies related to Germany but also account for research results from other countries.

2010/2011 school year.[3] According to a multistage sampling design, officially recognized and state-approved schools were sampled in the first step, and two classes were selected within each school in the second step (Skopek et al., 2013). The students were followed up for 9 years in a total of 12 panel waves.

We analysed the educational trajectories of 6088 students who completed the (general or restricted) HEEQ at the end of school year 12 or later.[4] We further restricted the sample to 5187 school leavers who provided valid information about their postsecondary educational careers 1.5 years after obtaining the HEEQ.

Missing data for the independent variables (see Table 1) were multiply imputed using iterated chained equations (White et al., 2011). Following the recommendations of von Hippel (2007, 2020), we imputed missing values of the outcome variable and deleted them after the imputation, and we applied a quadratic rule to determine the required number of imputations (M = 60). Furthermore, we included a set of auxiliary variables in our imputation models to improve efficiency. Additionally, interactions between ethnic origin and parents' education were included to account for origin group differences when missing values of relative education were imputed.[5]

Measures

Outcome Variable: Postsecondary Educational Transition

We analysed the first postsecondary transition within 1.5 years after obtaining an HEEQ. School leavers who enrol in HE are compared with school leavers who transition into VET and school leavers without a transition into postsecondary education.[6] The observation period of 1.5 years allows us to include postsecondary choices of school leavers with short

[3] This paper uses data from the National Educational Panel Study (NEPS): Starting Cohort Grade 9, doi:10.5157/NEPS:SC4:12.0.0 (NEPS Network, 2021). From 2008 to 2013, NEPS data were collected as part of the Framework Program for the Promotion of Empirical Educational Research funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, the NEPS has been carried out by the Leibniz Institute for Educational Trajectories (LIfBi) at the University of Bamberg in cooperation with a nationwide network.

[4] In Germany, there are several types of HEEQs. In addition to the general *Abitur*, which in principle entitles students to choose any tertiary course of study, there are restricted HEEQs that only allow students to choose certain fields (*fachgebundene Hochschulreife*) or programmes at universities of applied sciences (*Fachhochschulreife*). Most students obtain their general HEEQ after 12 or 13 years, depending on the federal state (e.g., Homuth, 2017). A restricted HEEQ can be obtained after 11 years at some school types. However, as some explanatory variables are not measured before grade 12, we do not include entry qualifications obtained after 11 years or earlier (N = 117 or 1.9%). Some students take more than 13 years because they have repeated grades or because they have obtained their HEEQ over the vocational track or second-chance education.

[5] As auxiliary variables, we utilize: school grades in German, math, and English from the penultimate school year before receiving the HEEQ; the last type of school; applications for postsecondary education in the first year after HEEQ; students' answers for parents' highest ISEI and parents' highest education; occupational aspirations in the penultimate school year.

[6] HE includes programmes at universities (*Universität*), universities of applied sciences (*Fachhochschule*), universities of cooperative education (*Berufsakademie*), dual higher education institutions (*duale Hochschule*), and universities of public administration (*Fachhochschule für öffentliche Verwaltung*). VET includes dual company-based apprenticeships, school-based training, civil service preparation courses, and other courses.

Table 1 Distributions of model variables

	Mean/share	SD	Min	Max	Imputed
Outcome: Educational transition: No transition	0.099				
VET	0.273				
HE	0.628				
Ethnic origin: Majority	0.723				0.026
Turkey	0.031				
Former Soviet Union	0.040				
Poland	0.046				
Other countries	0.160				
Generation: Majority	0.723				0.020
3rd generation	0.101				
2nd generation	0.143				
1st generation	0.033				
Immigrant optimism					
Occupational aspirations	69.61	15.59	14.4	89.0	0.341
Value of education	3.74	0.84	1	5	0.187
Perceived parental aspirations: VET	0.113				0.158
HE	0.694				
No vocational training/no opinion	0.184				
Both	0.009				
Friends' aspirations VET	3.83	1.42	1	7	0.176
Friends' aspirations HE	4.54	1.32	1	7	0.162
Relative status maintenance					
Relative education	70.02	22.21	0.69	100	0.292
Anticipated discrimination					
Anticipated name discrimination (VET)	0.22	0.60	0	3	0.049
Unemployment risk VET vs. HE	0.36	0.95	−4	4	0.221
Information deficits					
Subjective familiarity with VET	3.29	1.06	1	5	0.187
Subjective familiarity with HE	3.50	1.01	1	5	0.189
Academic self-concept	2.99	0.60	1	4	0.194
Aspirations and expectations					
Aspirations: VET	0.179				0.175
HE	0.768				
No vocational training	0.031				
Both	0.022				
Expectations: VET	0.216				0.178
HE	0.729				
No vocational training	0.041				
Both	0.014				
Controls					
Parents' education: No or some secondary	0.038				0.277
Complete secondary	0.338				
Some tertiary (not HE)	0.233				
Complete tertiary (HE)	0.391				

Table 1 (continued)

	Mean/share	SD	Min	Max	Imputed
Parents' highest ISEI	58.97	19.13	11.6	89.0	0.282
Type of HEEQ: general (Ref.: restricted)	0.768				
Grade point average of HEEQ (std.)	0.029	1.00	−2.58	2.63	0.013
VET completed before HEEQ (Ref.: no VET)	0.064				0.001
Gender: male (Ref.: female)	0.452				0.035
Age (at HEEQ)	18.94	0.90	14.7	24.3	0.000
Last school year: 2014	0.631				
2015	0.300				
2016	0.048				
2017	0.021				
Region: east (Ref.: west)	0.107				

$N = 5187$; Imputed analysis sample; mean/share: for categorical variables, the share is shown (1.000 = 100%); imputed: share of imputed values (1.000 = 100%)

delays in enrolment (for example, for a gap year, vacation, internship, job, or volunteering (Stöver, 2017)).

Ethnic Origin

According to the NEPS data, ethnic origin was defined by the countries of birth of students, their parents, and their grandparents (Olczyk, et al., 2016b), including ethnic minorities up to the third generation. We focused on the most prevalent origin groups in the German educational system: immigrants from Turkey, immigrants from countries of the former Soviet Union, immigrants from Poland, and a residual group (Olczyk, et al., 2016a). Immigrant students from Turkey mostly comprise descendants of guest workers who were recruited since the late 1950s to compensate for labour shortages in low-qualified jobs. A large share of immigrants from countries of the former Soviet Union and from Poland migrated to Germany based on their German (so-called *'Spät-Aussiedler'*) or Jewish heritage (see Olczyk, et al., 2016a). We also analysed different combinations of origin groups and immigrant generations to rule out some of the confounding between the two variables. Ethnic origin was primarily measured based on parent interviews. If parents' answers were not available, the students' answers were used.

Explanatory Factors

To ensure the causal order of the variables, all explanatory variables were measured before the transition to postsecondary education is possible, i.e., before obtaining the HEEQ. Details on the wording of the questions and the operationalization steps used are described in Table S1 in the Supplementary Information.

Immigrant optimism was operationalized with four indicators. First, we drew on occupation-related motives with idealistic occupational aspirations, which are measured based on an open-ended question on the preferred occupation and are translated according to the ISEI scale (as proposed by Dollmann, 2017). Note that occupational aspirations might not necessarily be exclusively driven by striving for upwards mobility (Salikutluk, 2016) but

also by the goal of maintaining one's relative status (Engzell, 2019) and avoiding potential discrimination in labour markets for lower-qualified employees. Additionally, information deficits on the returns of occupations with lower degree requirements could be relevant. Second, the value of education was measured with a mean score of two items for the general value of education as essential for cultural life and as a means to expand a person's horizon. Third, the transmission of educational aspirations was measured by students' perceived parental aspirations for postsecondary education (categories: VET; HE; no vocational training/no opinion; VET and HE). Like occupational aspirations, parents' degree aspirations could already be driven by alternative mechanisms (relative status maintenance, see Tong and Harris (2021); anticipated discrimination; information deficits).[7] Fourth, further reinforcement of aspirations was measured by the shares of friends with aspirations for HE and VET. Note that the latter captures not only the causal effects of significant others' aspirations but also self-selection by aspirational homophily (Kretschmer & Roth, 2021; Lorenz et al., 2020).

To measure *relative status maintenance motives*, we could not rely on information about parents' occupational status in the country of origin. However, we did have information on the education acquired by the parents in the country of origin. Since education and occupational status are generally highly correlated (e.g., Schneider, 2010), we therefore used parents' relative education as an approximation of relative status. To measure relative education, we followed the approach suggested by Ichou (2014). First, we computed a fivefold variable of the absolute educational levels of parents and their partners (no education up to complete primary; some secondary education; complete secondary education; some tertiary education; complete tertiary education). Second, we compared the absolute levels with the educational attainment of the reference population in the country of origin based on the Barro-Lee data (Barro & Lee, 2013) separately for parents and partners. If a person was born abroad and obtained his or her school or vocational degree abroad, relative education was computed based on the foreign country's population of the same age group and sex in the year of migration. If a person was born in Germany or obtained his or her school and, if applicable, vocational degree in Germany, relative education was based on Germany's population of the same age group and sex in the latest year of the Barro-Lee data (2010). Relative education is computed as a continuous percentile rank, with a theoretical range from 0 to 100. A value of 50 indicates that the educational attainment of a parent was equal to or greater than 50% of the reference population. After computing the relative education level for both parents separately, we took the maximum value for both parents.

To measure *anticipated discrimination*, we referred to the suggestions of Salikutluk (2016) and Tjaden and Hunkler (2017). First, students were asked to what degree they would expect school leavers with foreign names to be discriminated against in the VET labour market (Tjaden & Hunkler, 2017). The answers of school leavers from the majority population were set to the minimum, as expected discrimination based on foreign names most likely would not apply to them. Second, we employed an indirect measure of

[7] To assess the extent to which this influences the estimation of the relative importance of explanatory factors, we compare it with a reduced model, excluding occupational aspirations and perceived parental aspirations as indicators of immigrant optimism (Supplementary Information, Fig. S6b). In this case, only the explanatory value of information deficits increased minimally for most groups. Overall, occupational aspirations and parental aspirations seem to exert their influence on enrolment largely independently from other explanatory approaches. Furthermore, it lends plausibility to the conclusion that, by including occupational aspirations and parental aspirations as mediators of immigrant optimism, the relevance of other explanatory approaches is not substantially underestimated.

anticipated discrimination based on the difference between the unemployment risk associated with VET and the unemployment risk associated with HE (Salikutluk, 2016).

Information deficits were operationalized by two ratings of subjective familiarity with HE and VET in Germany. A comparatively more positive assessment of academic performance was measured with a short scale of three items regarding academic self-concept (Wohlkinger et al., 2016). As we controlled for actual achievement in our analyses, the measure reflects the deviation from the self-concept that would be expected based on achievement.

To determine the extent to which the four mechanisms exhaustively reflect ethnic differences in educational aspirations and expectations, we used the latter as a benchmark. Students were asked which type of postsecondary education they would wish for themselves (idealistic *aspirations*) and which programme they expected to enrol (realistic aspirations or *expectations*). Each measure differentiates between VET and HE. Additionally, two further categories capture students who aspire to no postsecondary education[8] and students who aspire to both types of programmes.

Control Variables

Socioeconomic background was measured with parents' highest ISEI (based on ISCO-2008) and parents' highest educational degree. The categories are the same as those utilized for constructing relative education, with the exception that the first two categories (no education, some secondary) were combined due to low case numbers in the lowest category (0.6%).

School achievement was measured by the type of HEEQ (1 = general *Abitur* vs. 0 = restricted types), and the grade point average of the HEEQ (raw values from 0.7 'very good' to 4.0 'sufficient' were z-standardized and recoded, so high values indicate better grades).

Additionally, we controlled for further factors that may be associated with educational transitions: completion of a VET program before obtaining the HEEQ, gender (male vs. female), age when obtaining the HEEQ, last school year, and region (eastern federal state vs. western federal state). Table 1 provides an overview of the descriptive statistics of the model variables in our sample (see Table S2 in the Supplementary Information for variable distributions by ethnic origin).

Results

Differences by Ethnic Origin and Immigrant Generation

Based on our hypotheses, we implicitly expected positive secondary effects of ethnic origin on postsecondary HE enrolment. In the first step, we tested for differences in postsecondary enrolment by ethnic origin and immigrant generation, net of socioeconomic background and achievement. We employed a threefold postsecondary educational transition variable

[8] This category (No vocational training) might comprise both students who do not aspire to or expect either type of training, and students who have not yet formed a clear preference. As the additional categories (No vocational training, Both) are small for aspirations and expectations, we focus on the distinct categories (VET, HE) in the analyses.

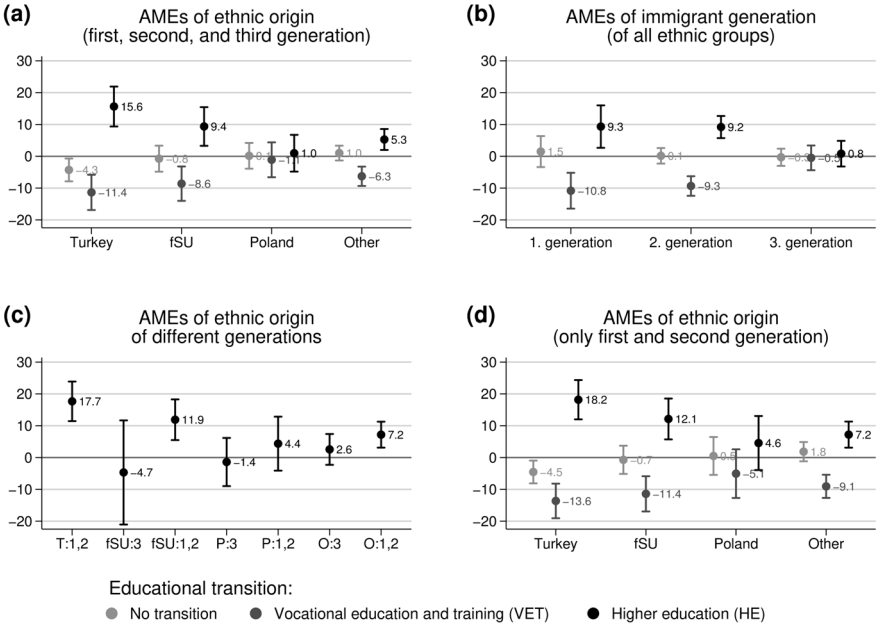

Fig. 2 Ethnic differences in the postsecondary transition: AME × 100 and 95% confidence intervals. *N* (**a**, **b**) = 5187; *N* (**c**) = 5174–5178 (varying across imputations); *N* (**d**) = 4655–4669 (varying across imputations). *HE* higher education, *VET* vocational education and training, *fSU* former Soviet Union. Subfigure c: combinations of ethnic groups and immigrant generations (e.g., T:1,2: Turkey, 1st and 2nd generation). Control variables: parents' highest education, parents' highest ISEI, type of entry qualification, grade of entry qualification, VET before obtaining entry qualification, gender, age, last school year, region

(with outcomes: HE, VET, no educational transition), and we conducted multinomial logistic regressions of the transition on different indicators of ethnic origin and immigrant generation, controlling for socioeconomic background and school achievement. Based on the multinomial regressions, we predicted *average marginal effects* (AMEs, e.g., Mood, 2010), multiplied by 100, which can be interpreted as percentage point differences compared to the reference category (majority school leavers). The results are depicted in Fig. 2.

The AMEs of most ethnic origin groups were positive for the transition to HE (black dots) and negative for the transition to VET (dark grey dots), ranging between 5.3 and 15.6 percentage points (Fig. 2a). Ethnic differences were most pronounced for Turks. For school leavers from Poland, we found no differences compared to the majority population.

When we employed differentiation by immigrant generation (Fig. 2b), the first and second generations showed very similar patterns of ethnic differences. However, we found no positive effects for the third generation.

As ethnic origin group and generation were associated, we further tested specific differences between ethnic groups of different generations (Fig. 2c). For the sake of clarity, we focused on differences in the transition to HE. The third generation from Turkey was excluded because the sample size was too small ($n = 10$). Again, AMEs were negligible for all groups of the third generation (between − 4.7 and + 2.6, all not significant). Among first- or second-generation school leavers, the already observed pattern of ethnic origin effects held, with the most pronounced effects for Turks (+ 17.7 percentage points).

Given that ethnic differences were negligible for the third generation, we excluded third-generation immigrants from our analysis sample. We proceeded with a variable that captured first- or second-generation ethnic minorities from Turkey, the former Soviet Union, Poland, and other countries (Fig. 2d). Again, we observed statistically significant positive effects in the transition to HE (black dots) and negative effects in the transition to VET (dark grey dots) for all groups except for immigrants from Poland and their descendants.

Regarding the outcome without a transition to postsecondary education (light grey dots), we found negative effects for Turks (−4.5 percentage points). This means that school leavers from Turkey transitioned more often into some kind of postsecondary education than majority school leavers with similar achievements and from similar social origins. Since only a few high school graduates realized no educational transition (see Table 1) and ethnic differences in this regard were small for most groups, we focused in the following on the decision between HE and VET.

Explanation of Ethnic Differences

We expected that immigrant optimism, relative status maintenance, anticipated discrimination, and information deficits are positively associated with the decision to enrol in HE and therefore contribute to ethnic differences in HE enrolment. Additionally, we expected that the four proposed mechanisms influence postsecondary transition indirectly via educational aspirations and expectations. Therefore, the introduction of additional mechanisms should reduce the AMEs of ethnic origin to a similar extent as aspirations and expectations. If this is not the case, the observed explanatory approaches are not exhaustive in capturing aspirational differences, and other factors might be important. Thus, aspirations and expectations served as a benchmark for the explanatory value of the proposed four mechanisms.

To test these assumptions, we first estimated AMEs of ethnic origin in the transition to HE (compared to the transition to VET), similar to the analyses in the previous subsection (Fig. 2d). The only difference in the estimation procedure is that we employed a dichotomous outcome (transition to HE vs. transition to VET) and, accordingly, a binary logistic regression model.[9] The AMEs are depicted in Fig. 3 (circles/M1).

We found positive effects for the transition to HE (compared to VET) for all ethnic groups. The AMEs ranged between 6.8 percentage points (Poland, $p < 0.10$) and 16.4 percentage points (Turkey, $p < 0.05$). The differences from the majority were significant for all ethnic groups, except immigrants from Poland and their descendants. To examine whether the assumed mechanisms explain ethnic differences, we estimated further models that include different sets of explanatory variables.

In the second model, we included educational aspirations and expectations (Fig. 3: triangles/M2) to test whether they contributed to ethnic differences. According to this model, aspirations and expectations to begin HE instead of VET were strongly associated with the actual transition (Supplementary Information, Table S4, M2). When increased aspirations and expectations of ethnic minorities were controlled for, the AMEs decreased (by between

[9] The distributions of analysed variables in the reduced sample without school-leavers who didn't enrol in HE or VET and without third generation immigrants are shown in the Supplementary Information (Table S3). Reducing the outcome variable to the choices HE and VET did not lead to different conclusions regarding the observed pattern of ethnic differences (Supplementary Information, Fig. S1), regarding the coefficients of mediators and control variables (Table S5), or explanations of ethnic differences (Fig. S2 and Fig. S5b).

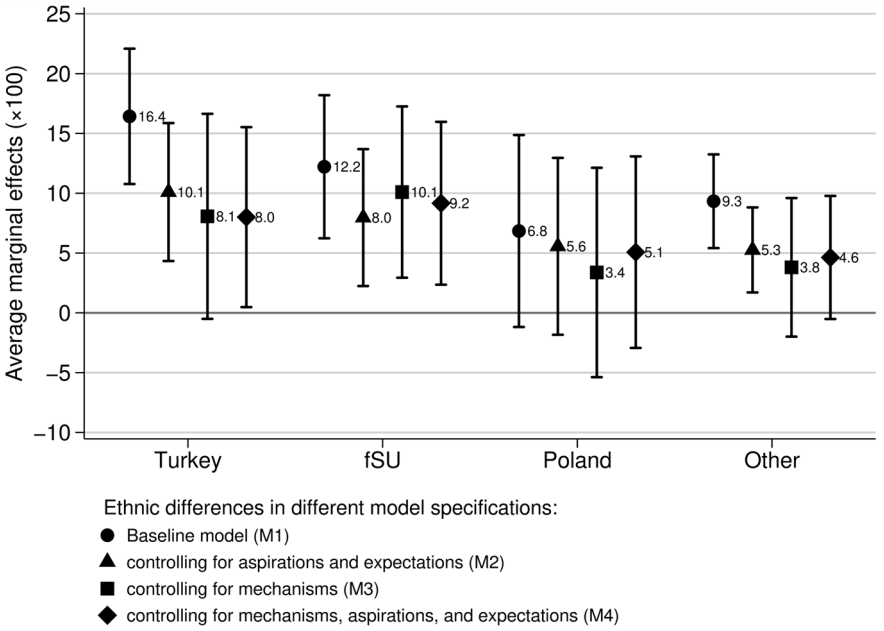

Fig. 3 Explanation of ethnic differences in the postsecondary transition to higher education: AME × 100 and 95% confidence intervals. $N = 4190–4203$ (varying across imputations); *fSU* former Soviet Union. Control variables: parents' highest education, parents' highest ISEI, type of entry qualification, grade of entry qualification, VET before obtaining entry qualification, gender, age, last school year, region. The underlying logistic regression models are documented in the Supplementary Information (Table S4)

1.2 and 6.3 percentage points). We conclude that the increased likelihood of HE enrolment can partially be explained by increased educational aspirations and expectations.

In the third model, we included indicators of the proposed mechanisms (immigrant optimism, relative status maintenance, anticipated discrimination, and information deficits). This allowed us to test whether those mechanisms contributed to the explanation of ethnic differences. Furthermore, compared to the model with aspirations and expectations, this model provided some indication of whether the proposed mechanisms were exhaustive in capturing the effects of aspirations and expectations. Most of those mechanisms were significantly associated with the educational transition in this model (Supplementary Information, Table S4, M3). The only exceptions are friends' aspirations for HE, anticipated name discrimination in accessing VET, and academic self-concept. Compared to those in the first model (Fig. 3, circles/M1), the AMEs of ethnic origin were reduced in M3. Furthermore, the AMEs were even slightly lower (for Turkey, Poland, and Other) than for those with aspirations and expectations as explanatory variables (triangles/M2). This finding supported the assumption that the effects and the explanatory value of aspirations and expectations were exhaustively covered by the proposed underlying mechanisms. Only the ethnic difference between students from the former Soviet Union and those from the ethnic majority was slightly better explained by aspirations and expectations than by observed underlying mechanisms. This finding indicated that other unobserved mechanisms of increased aspirations and expectations might have played a role in their preference for HE.

In the fourth model (diamonds/M4), both sets of explanatory variables were included to test whether directly measured aspirations and expectations provided additional explanatory value that exceeds their underlying mechanisms (squares/M3). As the remaining differences were not reduced substantially for most groups, we conclude that the explanatory value of aspirations and expectations is exhaustively covered by the proposed mechanisms. However, for ethnic minorities from the former Soviet Union, we find some indications that additional unobserved mechanisms might drove educational aspirations and expectations and ethnic differences in the transition to HE.

Taken together, our results suggested that the four proposed mechanisms (i) accounted for a substantial part of the ethnic differences in enrolment (Fig. 3, M3 compared to M1) and (ii) captured similar shares of ethnic differences compared to aspirations and expectations (M3 compared to M2). However, (iii) a substantial share of the differences was explained neither by the proposed mechanisms nor by educational aspirations and expectations (M4).

Contributions of Immigrant Optimism, Relative Status Maintenance, Anticipated Discrimination, and Information Deficits to Ethnic Differences

Based on the previous analyses, we cannot tell *which* of the four proposed mechanisms were relevant to the increased probability of enrolment behaviour among ethnic minorities. To address this question, we estimated the contributions of explanatory variables to ethnic differences utilizing the decomposition method proposed by Karlson, Holm, and Breen (khb method; Breen et al., 2013; Kohler et al., 2011). The khb method follows the same principles as models for linear outcomes (e.g., Kitagawa, 1955). The model estimates the extent to which group differences in endowments with mediating variables can explain group differences in an outcome. Analogous to the mediation approach, the explanatory value of a mediator variable depends on its association with the group variable and its effect on the outcome variable, net of other mediators and controls. In contrast to models for linear outcomes, the khb method applies a correction of coefficients in the baseline model without mediators to correct for rescaling bias when nested nonlinear models are compared (e.g., logistic regression). The decomposition model is based on logistic regressions of the transition decision (HE vs. VET) as specified in the previous analyses (Fig. 3, M1 and M3). It quantifies the extent to which ethnic origin effects can be explained by ethnic differences in the endowment with the mechanism variables.[10] We focused on the proposed mechanisms as explanatory approaches and exclude aspirations and expectations for three reasons. First, the proposed mechanisms precede aspirations and expectations according to theory. According to the theoretical model, aspirations and expectations merely mediate the contributions of mechanism variables (see Fig. 1). Second, the proposed mechanisms are more informative and specific about the decision-making of immigrants. Third,

[10] The model does not include heterogeneous effects of explanatory variables by ethnic origin. However, we compared the effects in separate models for the majority and ethnic minorities and find no significant differences (Supplementary Information, Fig. S3). Only for the effects of friends' aspirations, we find weak descriptive evidence that they are slightly more important for the educational transition among minority students compared to majority students, for whom the effects are practically zero. Therefore, the positive contributions of friends' aspirations to ethnic differences for students from Turkey and other countries (see Table 2) as well as the combined contributions of immigrant optimism and the total explained effects might be slightly underestimated by our decomposition model.

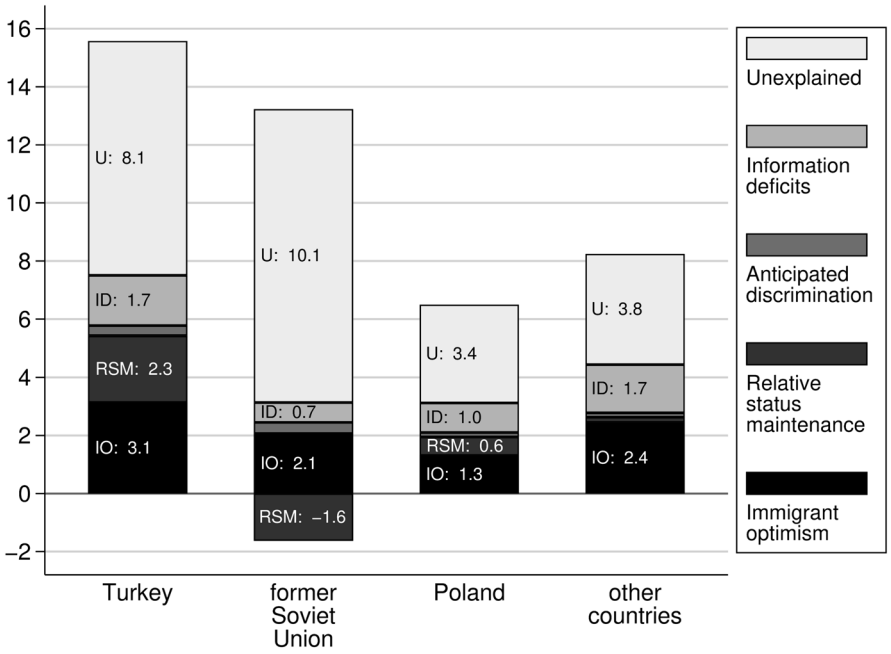

Fig. 4 Contributions of immigrant optimism, relative status maintenance, anticipated discrimination, and information deficits to ethnic differences in the postsecondary transition to higher education (AME × 100 based on the KHB method). $N = 4190–4203$ (varying across imputations); immigrant optimism (IO): occupational aspirations, value of education, perceived parental aspirations, friends' aspirations; relative status maintenance (RSM): parents' relative educational attainment; anticipated discrimination (AD): expected name discrimination in access to VET, expected relative unemployment risks with VET; information deficits (ID): subjective familiarity with VET and HE, academic self-concept; unexplained difference (U). Control variables: parents' highest education, parents' highest ISEI, type of entry qualification, grade of entry qualification, VET before obtaining entry qualification, gender, age, last school year, region. The detailed results are documented below (Table 2). Only groups of mediators with an absolute explanatory value > ± 0.5 are labelled

as shown above, the proposed mechanisms seemed to explain AMEs of ethnic origin to a similar extent or better than aspirations and expectations.

The results are depicted in Fig. 4. The four bars represent the AMEs of the four analysed origin groups.[11] Each bar is further decomposed into five parts (one for each of the proposed explanatory approaches and one for the remaining, unexplained difference).[12]

For example, the black bar section on the bottom in the left-hand bar indicates that 3.1 percentage points of the effect of Turkish origin were explained by ethnic differences in indicators of immigrant optimism. If this difference (3.1 percentage points) was related to the total effect for Turks (15.6 percentage points), immigrant optimism accounted for 20 percent of the total effect.

[11] Their magnitudes slightly differ from the effects in the previous analyses (Fig. 3, M1) because the KHB method applies a correction for rescaling to make total and direct effects comparable across nested nonlinear models.

[12] With the KHB method, the sum of disentangled mediation paths can exceed the explained effect (in terms of the difference between total and unexplained effects), when categorical independent variables are analysed, and differences are quantified as AME or average partial effects (APE). To tackle this problem,

Overall, immigrant optimism emerged as the most important driver of ethnic differences. Immigrant optimism contributed to an increased probability of transition to HE for all four groups, ranging between 1.3 percentage points (Poland) and 3.1 percentage points (Turkey).

Based on the detailed results of the decomposition (see Table 2), it was possible to further disentangle the investigated components into individual mediating paths of single variables or category contrasts. Immigrant optimism was examined based on occupational aspirations, the value of education, perceived parental aspirations, and friends' aspirations. For all origin groups, increased occupational aspirations (0.7 to 1.0 percentage points) and the combined indicators of perceived parental aspirations for HE and VET (0.6 to 1.6) had the highest explanatory value and were statistically significant for most groups. The positive effect of an origin from Turkey could also be driven by an increased value of education (0.3 percentage points, not significant) and the differential aspirations of friends for VET and HE (together, 0.4 percentage points, not significant).

Relative status maintenance explained 2.3 percentage points of the effect of Turkish origin ($p < 0.05$) and 0.6 percentage points for the group from Poland ($p = 0.06$). The explanatory value of relative education was negative for students from a country of the former Soviet Union (-1.6 percentage points, $p < 0.05$), as their parents were slightly negatively selected in terms of educational attainment (Supplementary Information Table S2). Thus, their increased rates of HE enrolment were partly suppressed by the comparatively low relative education of their parents.

The explanatory power of anticipated discrimination, while consistent across origin groups, was negligible in magnitude (0.2 to 0.4 percentage points).

Information deficits explained nearly up to two percentage points of the AMEs of Turkish origin and the residual group (each 1.7 percentage points). However, they contributed only moderately to the effects of the origin group from the former Soviet Union or Poland (0.7 to 1.0 percentage points). For all origin groups, the assumed greater assessment of academic performance in the form of an increased self-concept proved practically irrelevant for increased enrolment in HE. The central information-related explanation was the lower subjective familiarity of immigrants with the VET system in Germany (up to 2 percentage points; Turkey and Other: $p < 0.01$). For immigrants from Poland and the former Soviet Union and their descendants in particular, less familiarity with the vocational training system appeared to have played a less significant role. We attribute this to the fact that VET was more important in the Soviet Union and Poland than in many other main countries of origin for immigrants in Germany, such as Turkey or other countries where former guest workers were recruited.

Footnote 12 (continued)

we rescale the disentangled indirect mediation coefficients so that their sum is equal to the explained effect (defined by the difference between the total secondary effect and the unexplained secondary effect). Furthermore, we compare our main results with a decomposition of logit-coefficients that is unaffected by this inconsistency. With this approach, the composition of ethnic differences remains very similar (see Supplementary Information, Fig. S4).

Table 2 Contributions of immigrant optimism, relative status maintenance, anticipated discrimination and information deficits to ethnic differences in the postsecondary transition to higher education to higher education (vs. VET)

	Turkey	Former Soviet Union	Poland	Other
Summary				
Total effect	15.6**	11.6**	6.5+	8.2**
Unexplained effect	8.1+	10.1**	3.4	3.8
Explained effect	7.5**	1.5	3.1**	4.4**
Share explained	48%	13%	48%	54%
Decomposition				
Immigrant optimism	3.1	2.1	1.3	2.4
Occupational aspirations	0.7*	0.7+	1.0*	1.0**
Value of education	0.3	0.1	0.0	−0.0
Perceived parental aspirations: HE (Ref: VET)	2.5**	2.1**	1.0	1.4**
Perceived parental aspirations: No vocational training/no opinion	−0.8*	−0.7+	−0.3	−0.1
Perceived parental aspirations: Both	−0.1	−0.1	−0.1	−0.1
Friends' aspirations VET	0.2	−0.0	−0.3	0.1
Friends' aspirations HE	0.2	−0.0	−0.1	0.1
Relative status maintenance	2.3	−1.6	0.6	0.2
Parents' relative educational attainment	2.3*	−1.6*	0.6+	0.2
Anticipated discrimination	0.3	0.4	0.2	0.2
Name discrimination	0.2	0.3	0.2	0.2
Unemployment risk VET vs. HE	0.1	0.1	−0.1	−0.1
Information deficits	1.7	0.7	1.0	1.7
Subjective familiarity with VET	2.0**	0.9	1.6+	2.0**
Subjective familiarity with HE	−0.4	−0.2	−0.7	−0.3
Academic self-concept	0.1	0.0	0.0	0.0

AME × 100 are reported (corresponding to percentage points). Control variables: parents' highest education, parents' highest ISEI, type of entry qualification, grade of entry qualification, VET before obtaining entry qualification, gender, age, last school year, region. Significance levels (tested for summary and individual coefficients, not for groups of coefficients): $+ p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Summary and Discussion

In this study, we investigated whether immigrant school leavers or school leavers with immigrant parents are more likely to choose HE over VET after school. We proposed four theoretical explanations for the high aspirations and expectations of immigrants, combined them with theoretical models on the formation of aspirations and expectations, and derived four hypotheses. To test our hypotheses, we focused on the situation of school leavers with an HEEQ in Germany, where access to HE is less restricted than in other countries. To model decision behaviour, we first estimated ethnic differences that indicate whether immigrants and their descendants are more likely than natives to enrol in college given comparable levels of achievement and socioeconomic background. Consistent with the findings of previous studies, we found noticeable migration-specific secondary effects in the transition to HE (Jackson et al., 2012; Tong & Harris, 2021) that were most pronounced for

immigrants of Turkish origin (Kristen et al., 2008; Mentges, 2019). However, positive ethnic effects were evident only in the first and second generations of immigrants, while the transitions of the third generation did not differ from those of the ethnic majority.

Second, we examined what these positive ethnic effects are based on. For this purpose, we drew on four approaches proposed in previous research to explain migration-specific disparities (immigrant optimism, relative status maintenance, anticipated discrimination, and information deficits). The results showed that these mechanisms were able to explain a substantial share of the ethnic effects. Moreover, their explanatory power largely matched or exceeded the explanatory power of directly measured aspirations and expectations, indicating that the proposed mechanisms exhaustively reflect the increased aspirations and expectations of immigrants.[13]

Third, we quantified the extent to which the different explanatory approaches contributed to the ethnic differences in enrolment behaviour. The results showed that *immigrant optimism* was positively related to the transition to university and that it contributed to increased enrolment in HE for all immigrant groups, which is consistent with hypothesis 1. In terms of its explanatory power, it was the most important mechanism of immigrants' ambitious educational decisions. Consistent with the findings of previous studies, the ethnic effects for all groups of origin studied can be substantially attributed to increased parental aspirations (Salikutluk, 2016; Tjaden & Hunkler, 2017) and high occupational aspirations (Dollmann, 2017). The value of education had only negligible explanatory value (Hadjar & Scharf, 2019).

Relative status maintenance explained a substantial share of the increased probability of HE enrolment among Turks. In line with hypothesis 2, relative education was positively correlated with enrolment in HE. Thus, the importance of relative education, which has already been shown in various other contexts (Tong & Harris, 2021), can also be demonstrated for university access in the German education system. However, as immigrant groups differ in their educational selectivity, the explanatory value of relative education was negligible for immigrants from Poland and other countries, and it was even negative for immigrants from the former Soviet Union.

Anticipated discrimination was largely irrelevant for ethnic differences in the transition to HE (contrary to hypothesis 3). This partly corresponds to studies on earlier educational decisions (Dollmann, 2017; Tjaden & Hunkler, 2017). However, our additional analyses indicated that anticipated discrimination explained a substantial part of the ethnic differences in aspirations and expectations (see Supplementary Information, Fig. S5c – f). Therefore, it seems that ethnic minorities consider potential discrimination in accessing VET or the labour market for VET graduates in their aspiration formation but, eventually, make decisions based on other factors. Further research should address this gap by

[13] Furthermore, we conducted decomposition analyses to test if the four mechanisms explained ethnic differences in aspirations and expectations as implicated by our theoretical model. The results are documented in the Supplementary Information (Table S6c – f, Fig. S5c – f). Aspirations and expectations were significantly increased for students from Turkey, countries of the former Soviet Union and other countries, net of social origin and prior achievement. For all groups except students from countries of the former Soviet Union, differences in aspirations and expectations could be completely explained by the four mechanisms. In conformity with our main decomposition model (Fig. 4), we found that immigrant optimism, relative status maintenance, and information deficits contributed to increased aspirations and expectations of ethnic minorities. However, while the decompositions of aspirations and expectations indicated that anticipated discrimination played a role in the formation of immigrants' aspirations for HE, anticipated discrimination was negligible in explaining ethnic differences in actual enrolment in HE.

analysing how beliefs about discrimination develop and how relevant they are at different stages of educational decision-making.

Information deficits also contributed to the ethnic differences for all four origin groups (in line with hypothesis 4). In particular, the comparatively low familiarity with the German VET system explained a part of immigrants' preference for studying. This stands in contrast to previous studies that employed a more indirect measurement of familiarity and found a small explanatory value (Kristen et al., 2008; Mentges, 2019). Familiarity with the German VET system was lower for Turks than for immigrants from the former Soviet Union and Poland, which we conclude might be the result of particularities of the educational systems in the countries of origin. Familiarity with educational alternatives can have two different facets. On the one hand, it involves objective knowledge about certain educational alternatives and the prerequisites associated with them (e.g., Kao & Tienda, 1998; Kretschmer, 2019; Olczyk & Will, 2019). On the other hand, however, this measurement also includes a subjective component that goes beyond objective knowledge and may include an internalization of values and behaviours. We therefore suggest that secondary effects can be influenced only to a certain extent by the transmission of objective information to school leavers and that secondary effects depend rather on the long-term experiences of parents and socialization processes in family and peer contexts. In line with Tjaden and Hunkler (2017), we found no evidence that ethnic differences in HE enrolment can be attributed to immigrants' greater subjective assessment of their academic performance than that of natives.

Overall, the explanatory model comprising four approaches explained a substantial share of the ethnic differences. Together, approximately half of the effects were explained for students from Turkey, Poland, and other countries, while the explanatory value was lower for students from countries of the former Soviet Union. This indicates that school leavers from the former Soviet Union are characterized by other factors that were not considered in the present study but that make them more likely to enrol in HE.

Furthermore, we found large statistically significant positive effects for immigrants from Turkey and countries of the former Soviet Union that cannot be explained by the different approaches or by directly measured aspirations and expectations. Thus, we conclude that even with similar educational aspirations, expectations, and similarly pronounced endowments with explanatory factors, those groups prefer HE to VET. Compared to their aspirations and expectations, immigrants from most origin groups seem to be leaning more strongly towards HE enrolment than majority students with similar levels of aspirations and expectations. We suggest two possible explanations for this gap between aspirations and expectations and actual transitions. On the one hand, it is conceivable that some immigrant students or students with immigrant parents initially set less ambitious goals and adjust them as soon as they meet the requirements necessary for HE. On the other hand, it is possible that immigrants who aim for VET are less likely to realize this goal because it is more difficult for them to access VET, for example, due to possible discrimination from employers who hire apprentices. Based on our research findings, further research could take a closer look at the association between educational aspirations and transitions, the steps and experiences in the period of transition (e.g., information-seeking behaviour and application behaviour), and the adaptation of aspirations and expectations during this time.

In this study, we focused on Germany, where the transition to HE is largely choice-based once an HEEQ is obtained. In other contexts with stronger selection based on achievement, financial means, or other structural barriers, secondary effects in the transition might be substantially reduced, as ethnic minority school leavers probably encounter more barriers when they try to realize their aspirations (e.g., for the US, Roderick et al., 2011).

Furthermore, we expect that, in contexts without an established VET system, secondary effects in access to HE are not driven by information deficits about educational alternatives and therefore are less pronounced than in Germany. In our study, we showed that immigrants and their descendants have great potential to help overcome the shortage of skilled labour. Our study provides important information, particularly for education policy makers in countries with high barriers to university access.

However, future research should address several limitations. First, regarding the measurement of immigrant optimism, we were not able to capture the motive for status gain compared to the status of one's parents, as proposed by Salikutluk (2016). Instead, we utilized occupational aspirations, which might be driven by factors other than the status gain motive. Second, we assumed that relative education captures the relative position of immigrant parents in their countries of origin. As occupational status is strongly linked to education in the origin countries we analysed (Schneider, 2010), we assumed that relative education is an adequate indicator of individuals' position in the occupational hierarchy of their origin country. However, the relative position in terms of occupational status (socioeconomic status, income, prestige) might differ from that of education status in origin countries with a weaker link between education and occupation. Therefore, whether this operationalization of relative status maintenance can be applied should be reexamined for all countries of origin.

In addition, building on our results, further research is needed. In view of the ambitious decisions made by many descendants of immigrants, the next step is to ask to what extent they will also succeed in completing their studies and thus reduce ethnic educational inequality in the medium term. This is of particular interest for school leavers who have comparatively lower prerequisites (e.g., lower academic achievement). It has been shown that initial differences in achievement are associated with higher dropout rates in HE (Klein & Müller, 2020). However, the extent to which this is driven by secondary ethnic effects, as the role that aspirations and expectations might play in persistence in HE, remains unclear. Furthermore, it is theoretically important to ask whether the phenomenon of positive ethnic secondary effects is exhausted with university entry or whether this tendency continues into the further course of the university system, e.g., in relation to master's degree programmes and doctorates (e.g., Neumeyer & Pietrzyk, 2023).

In conclusion, this study contributes to the understanding of what factors drive ethnic preferences for higher education in their postsecondary educational transition. Our results highlight that multiple mechanisms are important in explaining secondary ethnic effects. Furthermore, we can show that some of the underlying mechanisms are relevant to various immigrant groups in different ways.

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Data Availability Access to the NEPS data (https://doi.org/10.5157/NEPS:SC4:12.0.0) can be requested at https://www.neps-data.de/Data-Center/Data-Access.

Declarations

Conflict of Interest No potential conflict of interest was reported by the authors.

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