

Diehl, Claudia; Pomianowicz, Katja; Hinz, Thomas

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On the wrong track? Perceived track mismatch among ethnic minority and majority students in the German educational system

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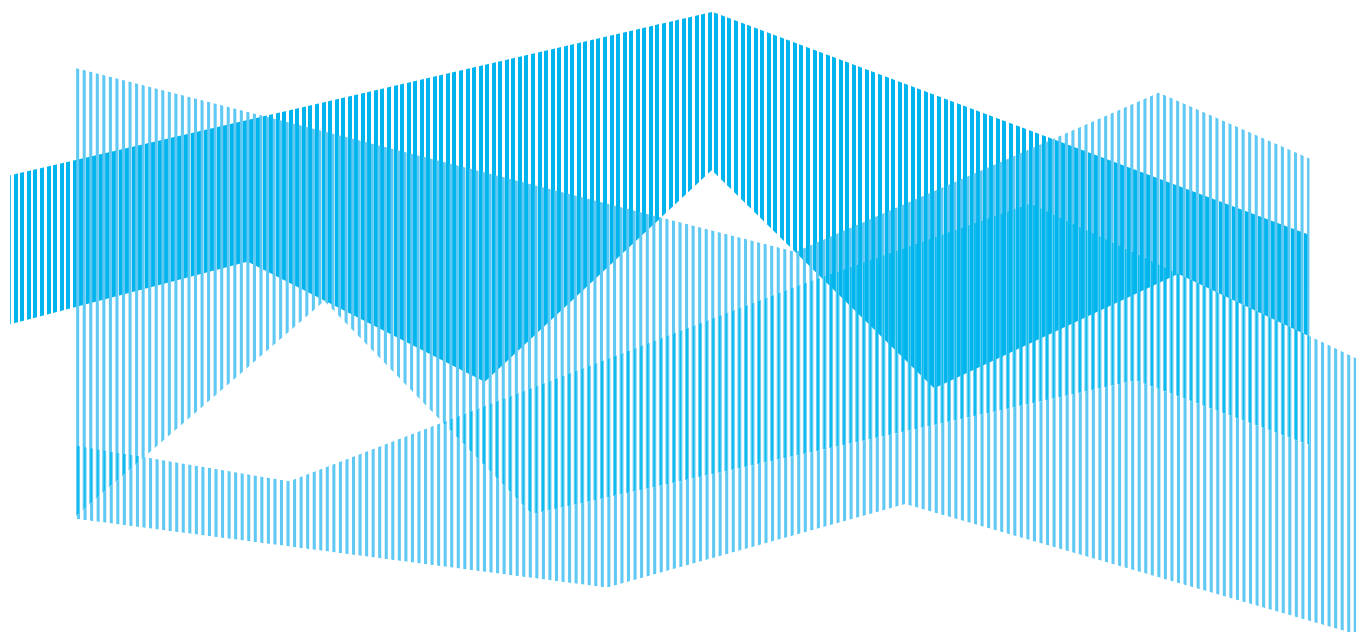
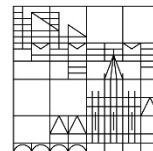
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On the Wrong Track? Perceived Track Mismatch Among Ethnic Minority and Majority Students in the German Educational System

Claudia Diehl, University of Konstanz, claudia.diehl@uni-konstanz.de

Katja Pomianowicz, University of Konstanz, katja.pomianowicz@uni-konstanz.de

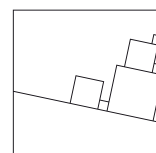
Thomas Hinz, University of Konstanz, thomas.hinz@uni-konstanz.de

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About the authors

Claudia Diehl is a professor of microsociology at the University of Konstanz and co-speaker of the Cluster of Excellence “The Politics of Inequality”. She is also a member of various advisory boards such as The Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany. Her research interests include integration processes among new immigrants in Europe as well as xenophobia and ethnic discrimination.

Katja Pomianowicz is a researcher at the University of Konstanz, Department of Sociology, and the Cluster of Excellence “The Politics of Inequality”. Her research focuses on educational inequalities between minority and majority students, the role of educational tracking in affecting such inequalities as well as perceptions of inequality and fairness in school.

Thomas Hinz is Professor of Sociology with a specific focus on Survey Methodology at the University of Konstanz and Principal Investigator at the Cluster of Excellence “The Politics of Inequality”. His substantive research interests cover social inequality, labor market, and discrimination. He contributed to survey methodology in the area of survey experiments.

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On the wrong track? Perceived track mismatch among ethnic minority and majority students in the German educational system

Claudia Diehl^{1*}, Katja Pomianowicz¹, Thomas Hinz¹

¹ Department of History & Sociology and Cluster of Excellence “The Politics of Inequality”, University of Konstanz, Germany

*Corresponding author: claudia.diehl @uni-konstanz.de

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Abstract

Based on an innovative survey of seventh graders in German secondary schools, this paper analyzes students' feelings that they should be on a higher educational track. We show that ethnic minority students are not only more likely than majority students to be placed in the lowest track, but they are also more likely to perceive this track placement as a mismatch. We test two explanations for this "perception gap" between the two groups. First, minority students may actually be more likely than majority students to be placed in a track that is too low for them (exposure to unfair treatment). Second, they are more likely than majority students to attend the lower educational tracks and to have highly ambitious parents. As a result, they may feel a greater need to attribute their limited educational success to unfair treatment in order to protect their self-esteem (ex-post rationalization of failure). We find that, compared to majority students, minority students' perceptions of being on the wrong track do not primarily reflect unfair treatment. Rather, it is high and unmet parental expectations that account for the "perception gap" between majority and minority students.

1. Introduction: A student's perspective on educational inequality¹

Pronounced ethnic inequalities can be found in many countries and have received considerable attention in educational research. Germany is a comparatively “late” immigration country. Its immigrant population is largely from southern and eastern Europe, the former Soviet Union, and more recently from the Middle East. It has long been dominated by individuals with relatively low levels of formal education due to the labor recruitment policies of the 1950s to 1970s (Sprengholz et al., 2021). This legacy, along with the often-described tight intrafamilial transmission of low educational attainment in Germany (Stephany, 2019), continues to shape the educational trajectories of immigrants and their descendants, the so-called second generation. Numerous studies show that minority children in Germany already have lower competencies when they enter primary school (Kähler et al., 2020), receive worse grades and teacher recommendations (Bonefeld et al., 2017; Krause et al., 2015), attend lower educational tracks (Krause et al., 2015), and achieve lower levels of educational attainment (Dollmann & Weißmann, 2020).

The studies that examine the reasons for these inequalities suggest that children of immigrants are primarily disadvantaged as children of parents with low levels of formal education (Diehl et al., 2016; Krause et al., 2015). In addition, they face more specific hurdles as immigrant children – or as children of immigrants.² They often have lower proficiency in the host language, even if they were born in the destination country (Kempert et al., 2016), and face teacher bias and discrimination, for example, in student assessments and grading (Sprietsma, 2013; Wenz & Hoenig, 2020). On the positive side, it has been shown that minority students have high educational aspirations and, given similar achievement levels, choose more ambitious educational pathways than non-immigrant children, although these do not necessarily lead to higher educational attainment (Dollmann & Weißmann, 2020; Salikutluk, 2016). Admittedly, these general patterns do not apply to all origin groups to the same extent, and some questions remain unanswered due to a lack of data.

Rather than add another study to this line of research, this paper addresses a question that has received surprisingly little attention, especially in quantitative research – whether minority students feel treated more unfairly in school than majority students. This focus is motivated by the observation that students' subjective perceptions of inequality and fairness have been neglected in the rich literature on educational inequality that “typically frames distributional

¹ For helpful comments we thank Marius Busemeyer, Georg Lorenz, Susanne Garritzmann, Steffen Schindler and Nadja Wehl.

² We use the term “minority children” for both, first- and second-generation immigrant students.

issues less in terms of justice than in terms of effectiveness, such as didactic fit, adjustment of learning pace, and academic achievement” (Resh & Sabbagh, 2016, p. 349). This is unfortunate because it is well known, especially from the organizational research literature, that these perceptions have consequences, e.g., for health or work motivation (D’Ambrosio et al., 2018; Robbins et al., 2012). In this article, we focus specifically on students' subjective perceptions that they belong to a higher educational track than the one they are currently attending.

We focus on perceived track mismatch because educational tracking has received much attention in the academic and societal debate on educational inequality. It refers to the early assignment of students to different school tracks based on ability (Hallinan, 2000). In the highly-tracked German system, track assignments based on teacher recommendations take place quite early, when children are about nine years old. They are non-binding in most states but still highly consequential. An assignment to the highest track (the so-called *Gymnasium*) provides a direct pathway to the *Abitur*, the certificate needed to enter the university. Since the effect of students' socioeconomic background on their educational aspirations and decisions is strongest at the early stages of their educational career, tracking has long been suspected of disadvantaging children who are late entrants to the education system or whose parents have a low level of formal education (Buchmann & Park, 2009, p. 249). The debate about the academic consequences of tracking (e.g., Dockx et al., 2019; Matthewes, 2021; Pomianowicz, 2023; Traini, Kleinert, & Bittmann, 2021; Traini, Kleinert, & Schindler, 2021) is still unsettled (Esser & Seuring, 2020; Heisig & Matthewes, 2022), partly due to measurement issues (Domina et al., 2019). In addition, numerous studies analyze whether teacher recommendations are based on students' actual abilities and performance or whether they reflect biases, especially against children from lower educational backgrounds, ethnic minority students, or boys (Bonefeld & Dickhäuser, 2018; Dudas, 2014; Maaz et al., 2011).

To explore students' perceived track mismatch, we use innovative data from a large project on students' perceptions of inequality and fairness (PerFair) in school and society. In short, our findings reveal that ethnic minority students who attend lower or intermediate tracks of the German educational system are more likely than majority students to believe that they have ended up on the wrong track. This "perception gap" between majority and minority students is only partly explained by the fact that the latter attend these tracks more often. Rather, it reflects that immigrant parents have much higher educational aspirations. In line with previous findings, our results show that immigrants 'aim high' in terms of education but are unable to meet their aspirations. This dissonance leads to higher feelings of being treated unfairly.

2. Understanding perceived track mismatch among minority students. Current insights and theoretical arguments

Previous studies addressing students' subjective perceptions of educational inequality and fairness in school mostly focus on their consequences. In school, these include low educational achievement (Chen & Cui, 2020; Mikk et al., 2016) and motivation (Berti et al., 2010), feelings of not belonging (Resh & Sabbagh, 2014), and bullying (Molinari et al., 2013). Outside school, these perceptions have been negatively associated with democratic attitudes and social, institutional, and political trust (Resh, 2018; Resh & Sabbagh, 2016, p. 362). Few studies examine which students feel treated fairly at school and why, i.e., treat these perceptions rather than their consequences as the main explanatory challenge. Even fewer relate these perceptions to students' socioeconomic or ethnic background (Resh & Sabbagh, 2016, p. 230).

Moreover, among the various rewards distributed in school, just teacher-student relationships, that is, the distribution of relational rewards (ibid.), have received the most attention. Many other studies have examined the perceived fairness of grades (e.g., Jasso & Resh, 2002; Resh, 2010; Resh & Dalbert, 2007). The perceived fairness of the allocation of learning places (such as tracking), a key indicator of educational justice (Resh & Sabbagh, 2016), has rarely been studied (on the perceived stigmatization of students on the lowest track, see Bardach et al., (2023) and Völker and Hansen-Schaberg (2016)). This is surprising, as the fairness and bias of teacher recommendations for particular school tracks have received much attention (see next section). Moreover, feelings that one has been placed on the wrong track should have important implications for student motivation because short of receiving a failing grade, this unfairness refers not to a momentary condition but to a situation that cannot be easily reversed, particularly in countries that have a rigid tracking practice. Even if some students manage to move to more challenging tracks later on, it is usually the more privileged students who manage to do so (Biewen & Thiele, 2020; Blossfeld, 2018; and Schindler, 2017 for long-term track mobility effects on social inequalities in educational attainment).

Why do some students believe that they belong to a higher track?

A suitable theoretical framework for analyzing students' perceptions of unfair treatment is provided by the literature on perceived discrimination among ethnic and racial minorities. It starts out from the fact that perceived unfair treatment is different from actual unfair treatment. Scholars of the field have pointed out that “the study of perceived discrimination is not a poor

analytical substitute for that of perpetrated discrimination; it is the study of an entirely different question.” (Small & Pager, 2020, p. 63) In many situations, it is unclear whether those who experience a negative outcome (such as not getting a job or apartment) were rewarded unfairly. As a result, perceptions of unfair treatment generally reflect both actual unfair treatment and attributional processes that frame negative experiences as the result of unfair treatment - to varying degrees.

Applied to our research question, this implies that there are two main explanations for why students believe they belong on a higher track. First, given their abilities, performance, and behavior, they may have been placed on a track that is too low. In line with the literature mentioned above, this mechanism has been termed “exposure” (to discrimination) and is based on the assumption that perceptions of unfair treatment often reflect actual unfair treatment (Schaeffer & Kas, 2023). However, since it is difficult for the individual child to judge whether they have ended up on the right educational track, the second possibility also needs to be taken into account. Due to the ambiguity of potentially discriminatory situations, perceptions of unfair treatment may also reflect more complex attributional processes.

Are minority students more likely to end up on the wrong track? The "exposure mechanism"

According to previous research, minority students could be more likely than majority children to be misplaced in lower tracks of the educational system. Teachers have some leeway in assessing and grading students and making track recommendations. Neither grades nor track recommendations are based on standardized tests in Germany. Several studies have analyzed whether track recommendations are fair by comparing the likelihood of receiving a recommendation between children of non-academic or immigrant parents to peers with academic or native-born parents – at equivalent levels of achievement. Some but not all audit studies, as well as research using test-based data from educational assessments, provide evidence of bias and discrimination (on grading see Kristen, 2006; Sprietsma, 2013, on track recommendations and ability assessments see Lorenz et al., 2016; Wenz & Hoenig, 2020).

A study conducted in Hamburg assessed children's aptitude for secondary school through achievement tests and examined the likelihood of receiving a recommendation for secondary school. The results indicate that at the same levels of achievement, children of educated parents – a group in which minority children are underrepresented – are slightly more likely to receive such recommendations (Dudas, 2014, p. 264). Other studies also suggest that teachers consider children's family background when recommending secondary school (Maaz et al., 2011, p. 71).

Steinmayr et al. (2017) show that the link between objectively measured competencies in achievement tests and transition recommendations at the end of fourth grade is generally weak, both for children with low and high levels of parental education (ibid.: 96). According to this study, the systematic disadvantage for children of non-academic parents occurs more in grading and less in recommendations.

However, Wenz and Hoenig conducted an experimental study and asked teachers to grade essays allegedly written by fourth graders and assess students' ability to succeed at the highest track of secondary school (*Gymnasium*). Like in Sprietsma (2013), these essays were supposedly written by a Turkish or a German child from a high or a low socioeconomic background. The results show no bias in grading but in teacher assessments of students' future performance – but only for the subgroup of students who “wrote” good essays. In this experimental condition, Turkish and low SES students were less likely to be perceived as having the potential to succeed at the *Gymnasium* than high SES and German children. One explanation for biased recommendations is that teachers base their grades and recommendations on children's work and learning patterns that may differ between those from more and less privileged backgrounds (Riek & van Ophuysen, 2014). While it could be argued that these patterns ultimately influence success in secondary school, children from less educated parents, including many minority children, have acquired their skills against greater resistance. In contrast to work and learning patterns, teachers who predominantly come from ethnic majority families (Rotter, 2015) may not reward this accordingly.

Overall, this line of research shows that, by far, the most important predictor of receiving a recommendation for the *Gymnasium* track is a child's grades and competencies. In addition, some studies suggest that at same levels of achievement, there are – relatively small – differences based on socioeconomic or ethnic background to the detriment of students from parents with low levels of formal education and minority parents.

H1: Minority children believe more often that they belong to higher educational tracks than majority children because they were more often wrongly assigned to the lowest educational tracks.

***Are immigrant students in greater need to rationalize a lack of educational success ex-post?
The "attribution mechanism"***

As outlined above, the literature on perceived discrimination points to the importance of a second factor in explaining perceptions of unfair treatment, namely attributional processes. A

key mechanism in this regard is the so-called “ex-post rationalization of failure” (Schaeffer, 2019, p. 67). It describes the psychological benefits for the unsuccessful of framing negative events as discriminatory. Attributing failure to discrimination has a positive impact on an individual’s self-esteem (Thijs & Piscoi, 2016). In terms of previous findings on disadvantages in track positions among minority children, this leads to the second hypothesis that will be empirically tested in two steps. In the first step, the simple prediction is that *ceteris paribus*, students who visit the lowest educational tracks feel unfairly treated more often.

H2a: Minority children believe more often that they belong to higher educational tracks than majority children because they visit the lowest educational tracks more often.

In the second step, we ask about the specific circumstances under which an "ex-post rationalization of failure" plays a role. The extensive literature on perceived injustice suggests that unequal rewards per se do not lead to feelings of unfair treatment (Adams, 1965). Instead, people have expectations about what kind of reward they deserve for a given input. Social groups may differ in the rewards they expect due to “different learning or comparison opportunities over their lifetimes,” which in turn reflect different structural conditions (Liebig & Sauer, 2016, p. 42). Concerning minority student's perceived unfairness in the education system, their parents' educational aspirations, as demonstrated in numerous empirical studies, are of primary interest here. Educational aspirations, i.e., the highest educational levels students (or the parents) wish (for their children), differ by their socioeconomic background but also between majority and minority students (Becker et al., 2022; Becker & Gresch, 2016; Zimmermann, 2019).

One crucial explanation for SES differences in educational aspirations is the status maintenance motive: “Parents most want their children to maintain their own educational level (Breen & Goldthorpe, 1997)” (Zimmermann, 2019, p. 68). Children aim to conform with their parents’ aspirations to avoid cognitive dissonance (ibid.). While this implies that majority children aim to maintain but not necessarily surpass their parents’ level of education, minority children’s educational aspirations show certain specificities (Becker, 2010; Kristen & Dollmann, 2009; Pomianowicz, 2024).

Immigrants are a positively selected group in terms of ambition, often strive for upward mobility, and are not easily discouraged by temporary hardship and a lack of success, a phenomenon discussed under the term “immigrant optimism” (Kao & Tienda, 1998). Due to the challenges associated with the migration process, especially the devaluation of resources

such as education, language skills, and social capital, many immigrants cannot live up to these ambitions. In addition, migrants often come from countries with generally lower levels of education and limited opportunities for upward mobility (Spörlein & Kristen, 2019). As a result, they pass on these high and unfulfilled educational aspirations to their children. Thus, minority children may feel a stronger pressure than majority children to surpass their parents' educational attainment, even at similar levels of socioeconomic background. Indeed, minority students choose more ambitious educational paths than native children at the same level of achievement (Dollmann, 2017). A more problematic consequence may be that they also feel a greater need to explain and justify their failure in terms of the described “ex-post” rationalization of failure.

The argument that minority members’ perceptions of unfair treatment reflect unfulfilled mobility aspirations has been formulated and empirically tested in a paper that aims to explain variance in general perceptions of discrimination among second-generation migrants in Germany. “It might be in this aspiration to surpass their parents that they fail and which then turns into perceived discrimination – an unanticipated downside of immigrant optimism” (Schaeffer, 2019, p. 67). Based on this argument, Schaeffer demonstrates empirically that general perceptions of discrimination are pronounced among German-born adult children of immigrants with lower levels of educational attainment than their parents. However, when explaining the perception gap between majority and minority students, the mechanism of failed intergenerational upward mobility is unlikely to play a role. After all, previous findings suggest that immigrant children experience slightly *more* upward mobility than majority children (Bönke & Neidhöfer, 2018; Oberdabernig & Schneebaum, 2017, for the link between parental income and children’s chances for Abitur see Dodin et al., 2024).³

However, even if differences in both groups’ intergenerational mobility cannot explain the perception gap between minority and majority students, group differences in parental educational aspirations may be crucial when comparing natives with immigrants. In line with the arguments about immigrant optimism, the higher propensity of minority students to believe that they have been unfairly placed in lower tracks of the educational system could reflect that they are more likely than majority students to have parents with high educational aspirations. Since a failure to conform to their parents leads to cognitive dissonance (Zimmermann, 2019), they may feel a higher need to “ex-post rationalize” their failure by attributing their placement on a low track to unfair treatment.

³ Note, however, that this question is not easy to settle since information about immigrant parents’ educational degrees is notoriously unreliable.

H2b: Minority children believe more often that they belong to higher educational tracks than majority children because their parents have higher educational aspirations.

3. Perceived track mismatch in the German context

We study perceived track mismatch in the German education system, which is known for its high degree of tracking. Sorting into school tracks starts early and predominantly occurs between schools, even though within-school tracking also exists (Pomianowicz, 2023, p. 308). Students attend hierarchical tracks and receive different curriculum contents that lead to distinct school certificates. Usually, four types of school tracks can be distinguished: lowest tracks (*Hauptschule*), intermediate tracks (*Realschule*), comprehensive schools (*Gemeinschafts- or Gesamtschule*), and academic school tracks (*Gymnasium*). The latter opens the way up to university education. The lowest school tracks are gradually replaced by comprehensive schools, in which, in some cases, Abitur attainment is also possible (Henninges et al., 2019). Since tracking is organized mainly between schools, and students attend different school buildings, track mobility is relatively low (Blossfeld, 2018), i.e., the first school certificate students attain is usually in line with their first track position (Henninges et al., 2019). At the same time, attended track levels are very salient to students compared to systems where tracking is exercised to a lower extent (Legette, 2020). Both observations make Germany an interesting case to analyze perceived track mismatch because it can be assumed that in cases of misplacement and with fewer possibilities to change tracks, students are more frustrated compared to countries with more flexible tracking practices.

4. Data and methods

Data

We use novel data from the project “*Students Perceptions of Inequality and Fairness (PerFair)*,” which is a survey of seventh graders in Germany.⁴ This study aims to describe and explain how perceptions of educational and social inequality develop during early adolescence and to analyze the attitudinal and behavioral consequences. The first wave of the standardized survey was collected during the school year 2022/23 in three German federal states, namely Baden-Wuerttemberg, Saxony, and Schleswig-Holstein.⁵ The sampling procedure followed a

⁴ For more information on the project, please visit <https://www.exc.uni-konstanz.de/en/inequality/research/projects/students-perceptions-of-inequality/>

⁵ The survey was implemented by the IEA Hamburg.

multi-stage stratified sampling strategy. First, secondary schools with students in the seventh grade were randomly selected among all prevailing school types in the three federal states (explicit stratifying unit).⁶ Second, to achieve a proportional representation of students with a minority background and schools in rural and urban areas, schools were additionally selected according to these two criteria (implicit stratifying unit). Third, among the participating schools, all classes with seventh-grade students were invited to take part in the survey. After all, 3119 students⁷ in 200 classes and 78 schools participated in the survey.

Measurements

To construct our dependent variable *perceived track mismatch*, we first code students' actual track level position in the three federal states. The track-level designation, number, and types of school tracks vary by federal states but are comparable to some extent across states. We code school tracks according to the four categories: lowest school track, intermediate track, comprehensive school, and academic track (see Table A1). Second, we measure perceived track mismatch by the survey item asking students, "Do you think another type of school would suit you better?" Students could answer with "no" or "yes" while also indicating which track they would find more suitable. Students who indicated that a higher than their actual track is a better fit for them are coded as having a perceived track mismatch. Students who answered "no" and those who answered "yes" but (probably by accident or due to a poor understanding of the question) chose the same or a lower track than the one they are currently attending are included in the reference category of no perceived track match (see Table A1 in the Appendix for more details on the coding). Students already attending the highest educational track cannot perceive track mismatch according to our definition and were, thus, excluded from the analyses.

Students who were born in a different country than Germany or have parents who were both born abroad are coded as *minority students*. We thus group together first- and second-generation immigrant students. Our theoretical considerations apply to both groups – and case numbers do not allow for a more fine-grained differentiation. Students who were born in Germany and have German-born parents are defined as majority students and included in the reference category. Those with only one parent born abroad are defined as majority students. These students are

⁶ In accordance with international standards, the PPS (Probability Proportional to Size) sampling was used. Schools which participated in the PISA survey were excluded and replaced by schools with similar characteristics according to the sampling frame.

⁷ Among the participating classes, consent for participation was given to 3316 students (68.2). Of these students, 197 did not take in the survey (participation rate: 94.1 percent).

often found to have more similar characteristics to majority than to minority students, e.g., in terms of parental education (Becker, 2011; Segeritz et al., 2010).

To test H1 (exposure to unfair treatment) is challenging. This is a well-known problem in the literature on perceptions of discrimination – they are difficult, if not impossible, to validate. We face a similar challenge as we do not know whether a student actually belongs to a higher track or not. In some German federal states, teachers have to follow grades rather strictly when they issue their track recommendations.⁸ However, they are encouraged to consider other factors, such as students' cognitive potential as well. The latter shows a medium to high correlation with grades (Steinmayr et al., 2017, pp. 51–53). In addition, it is important to note that not all students follow these recommendations, and minority students more often deviate from track recommendations than majority students (e.g., Gresch, 2012).

Without going into the complicated details of the determinants of track allocations, it is clear that we cannot assess whether a student actually attends an unfairly low track with the data at hand. As a first indicator for whether this is the case, we thus use an admittedly limited proxy variable. We calculate whether a student's cognitive skills are higher than the cognitive skills of other students on this track.

Students' **cognitive skills** were assessed by means of a sub-test of the CFT 20-R "Grundintelligenztest Skala 2 – Revision", measuring fluid intelligence. This kind of test was developed as a "Culture Fair Test," ideally measuring intelligence without the influence of external factors, such as the socioeconomic or cultural circumstances of students and language requirements (Cattell, 1973; Lozano-Ruiz et al., 2021; Weiß, 2006). Yet, minority students perform worse in this test (see Figure A1 in the appendix), which is not a peculiarity of our data (see e.g., Rosselli & Ardila, 2003). The reason for this is that the test might not be as "culture fair" as intended. Rather, it could be biased against minority children because it is not adapted to the culture-specific norms of students but relies on Western-specific norms (Lozano-Ruiz et al., 2021; Rosselli & Ardila, 2003). In addition, minority students with a different first language may have difficulties understanding the instructions for the test (Weiß, 2006). And finally, students' cognitive potential, which is equally distributed across groups, might be realized differently under various socialization conditions (Esser, 2021, p. 135).

⁸ For example, in our sampled federal states Baden-Wuerttemberg and Saxony, students need to meet a certain grade average in Mathematics and German at the end of the school year to receive a recommendation for the Gymnasium.

The average cognitive skill levels by track type are calculated for each federal state. Afterward, we calculate each student's *deviation from the attended track average*. The final variable is calculated as a z-score to allow for comparability of effect sizes between continuous variables (negative values = below the track-level average cognitive skills, positive values = above the track-level average cognitive skills; see Table A2 for more details). Hence, positive values shall be interpreted as a proxy for a student who has been assigned to a track that is too low for them, given their cognitive abilities. When interpreting our findings based on the cognitive skill-related indicators, it has to be kept in mind that group differences in average cognitive skills and deviations from track average are less important for us than group differences in how this deviation relates to perceived track mismatch.

To test H2a and H2b (ex-post rationalization of failure), we first consider students' *current track position*. This variable is key in testing H2a and indicates whether students attend the lowest tracks versus the intermediate tracks or comprehensive schools (reference category, see Table A1 for details on the coding). To test H2b, we secondly measure students' perceptions of their parents' *educational aspirations*. The survey question asked students what kind of school education they believe their parents wish for them. Students who indicated that their parents wish the „Abitur“ for them, which is the highest school certificate in Germany, were coded as having parents with high educational aspirations. Parental aspirations towards lower educational degrees, indifferent aspirations, and students who did not know their parents' aspirations were coded as having low parental aspirations.⁹

We control for students' socioeconomic background by including *parents' highest educational degree* in our models. Since we surveyed students at a young age, many could not provide this information. Fortunately, about half of the parents filled out a questionnaire. We could draw from both questionnaires to obtain this important information in these cases.¹⁰ We include cases where information on parents' education is still missing as a separate category to not exclude too many cases. The final variable thus indicates whether a student has at least one parent with a university degree (reference category), parents without a university degree, or parents for which no such information is available.¹¹ We also control for gender and for school grades (last

⁹ Around 16 percent of students (N=506) did not know their parental aspirations or had a missing value on this item.

¹⁰ We use information from parents' questionnaires and in cases of missings, we use information from students' responses.

¹¹ We also include cases when information on one parent was missing. When information on one parent was missing and one parent had university education, this student was coded as having at least one parent with university education. If information on one parent was missing and the other parent has no university education, this student was coded as having no parents with university education.

final grades in German and Math, reaching from 1 (very good) to 6 (insufficient). The final measure of grades is calculated as a z-score. The latter is important because students with good grades may feel more often that they visit a track that is too low for them (see Table 1 for a descriptive summary of the coded variables).

Analytical strategy

After excluding students in the highest school track, the number of cases amounts to 1,835. Of these students, 536 have at least one missing value on the dependent or independent variables. After the imputation of missing values of the independent variables, the final analysis sample amounts to $N = 1,572$ students (see Table A3 in the Appendix). Since our dependent variable is binary, we apply logistic regression and calculate average marginal effects (AMEs) (Auspurg and Hinz 2011), which are reported with the help of coefficient plots (Jann, 2013). They can easily be interpreted as average changes in the probability (in percentage points) of perceiving a track mismatch following a change in the categories of the independent variables. Moreover, due to the nested data structure, we conduct two-level random intercept models accounting for students nested in classes. In order to account for item-nonresponse, we employ multiple imputations by chained equations on all independent variables (Azur et al., 2011). With this method, 20 imputations are created, and the average point estimates and standard errors are calculated and reported.

5. Findings

We start by giving some descriptive insights (see Table 1). Overall, perceived track mismatch is far from frequent among seventh graders who did not make it to the Gymnasium. While 13 percent of all students feel misplaced, there is a clear divide between majority and minority students. The latter group is much more likely to perceive a track mismatch (23 percent compared to 10 percent of majority students).

Majority and minority students markedly differ in terms of the three variables assumed to explain the perceived track mismatch, i.e., cognitive ability relative to the track average (H1), actual school track attended (H2a), and parental aspirations (H2b). Concerning the deviation of cognitive skills as measured in the test –and being aware of the caveats discussed above – minority students tend to score below the track average (-.25), while majority students score slightly above the track average (.04). Moreover, minority students more often attend the lowest tracks (27 percent) than majority students (8 percent). Furthermore, there is a significant discrepancy between the aspirations of minority and majority students' parents. Among immigrants, notably, 43 percent of minority students' parents aspire for their children to obtain an Abitur degree, whereas only 24 percent of majority students' parents share this aspiration. The most important observation regarding the control variables pertains to parental background: The share of students with at least one parent with a university degree is almost equal between majority and minority students (28 and 26 percent). Yet, 46 percent of majority and 38 of minority students have a lower educational background. The information is missing or unreliable for 28 percent of the students; this share is higher among minority students (whose parents often obtained their degrees abroad).

Table 1: Descriptive Statistics (N = 1572)

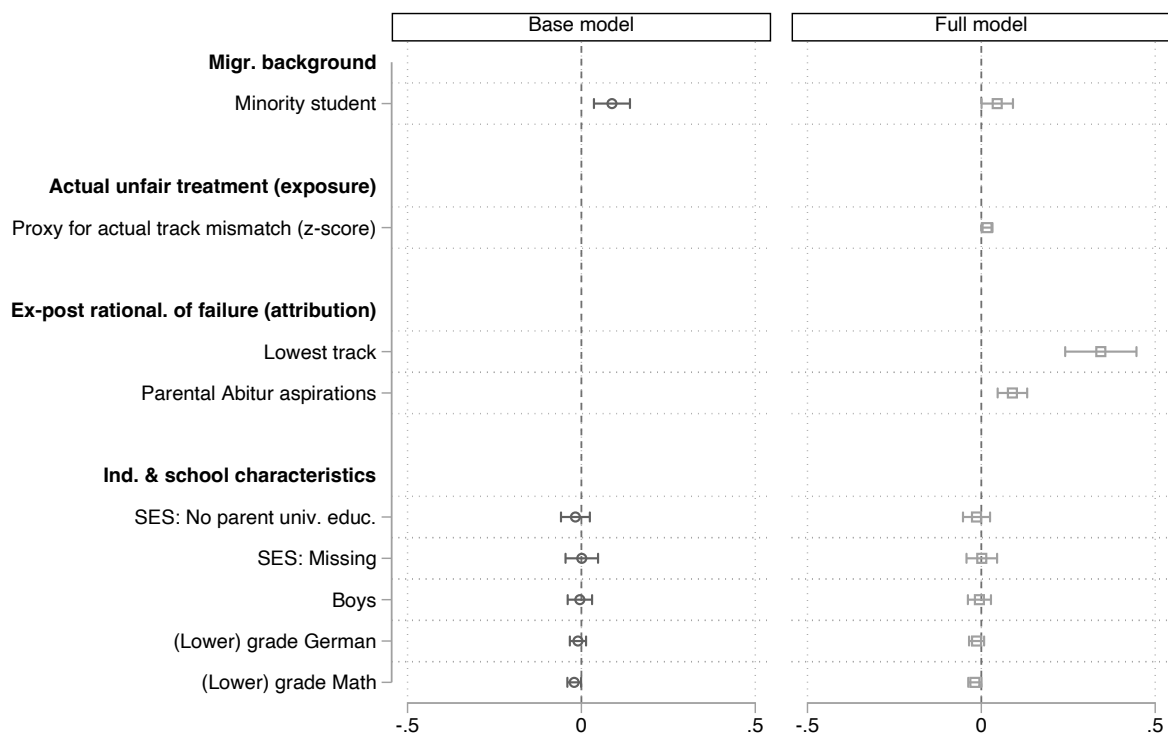
	Univariate variable distribution					Bivariate variable distribution by immigrant background	
	Min.	Max.	Mean/ Prop.	SD	Number of obs.	<i>Majority student (mean)</i>	<i>Minority student (mean)</i>
Perceived track mismatch	.00	1.00	.13	.34	1572	.10	.23
Immigrant background: yes	.00	1.00	.20	.40	1525	-	-
Proxy for actual track mismatch (z-score)	-4.50	2.95	-.03	1.09	1533	.04	-.25
School track: Lowest track			.12		1545	.08	.27
Parental Abitur aspirations	.00	1.00	.29	.45	1490	.24	.43
<u>SES: Parents' university education</u>					1572		
At least one parent univ. educ.			.28			.28	.26
No parent univ. educ.			.44			.46	.38
Missing			.28			.26	.35
Gender: Boys	.00	1.00	.51	.50	1529	.52	.51
(Lower) grade German	1.00	6.00	2.72	.88	1475	2.65	2.99
(Lower) grade Math	1.00	6.00	2.79	1.03	1469	2.73	2.97

Source: PerFair data, wave 1. Note: Differences in the number of observations (N) for each variable to the final number of observations (N=1572) will be imputed for the analyses.

Multivariate analyses: Which role do actual unfair treatment and ex-post rationalization of failure play in explaining the “perception gap” between minority and majority students?

We first present a full model that includes the grouping variable (minority vs. majority students), indicators for the theoretical mechanisms and control variables. Results displayed in Figure 1 confirm that, in the base model, minority students believe more often than majority students that they belong on a higher track. The full model shows that students whose cognitive skills are above track average (according to our proxy-variable) believe this more often only by tendency. There is more evidence for the role of attributional processes: Students on the lowest track and those with ambitious parents are particularly likely to perceive a track mismatch. SES, grades and gender are hardly associated with perceived track mismatch.

Figure 1. Explaining perceived track mismatch: Two-level logistic regression (AMEs).

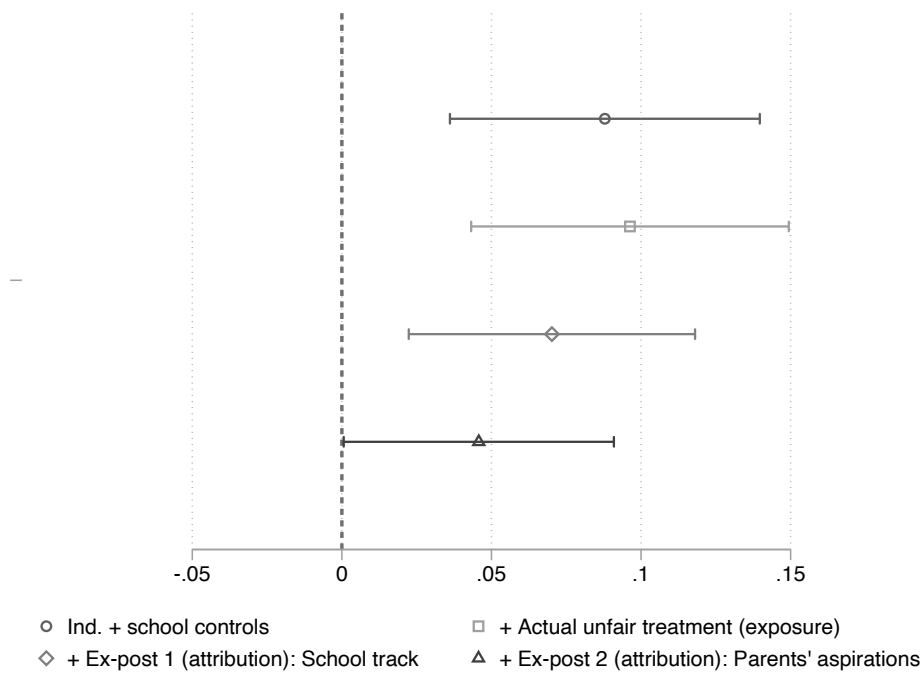


Source: PerFair data. N=1572. Confidence intervals at 95%. Full results in Table A4.

To test our hypotheses more directly, we employ a mediation analysis introducing step-by-step the measurements for our mechanisms (see Figure 2). This way, we can test how far the given mechanisms account for the perceived track mismatch gap between majority and minority

students. To begin with H1, adding the proxy for actual track mismatch does not alter the effect size of the grouping variable. It even gets a bit larger. In other words, the stronger perceived track mismatch in the minority group cannot be attributed to a more frequent factual misplacement according to our proxy variable. Therefore, H1 is refuted.

Figure 2. Explaining differences in perceived track mismatch between majority and minority students. Two-level logistic regression (AMEs).



Source: PerFair data. Note: Coefficient display minority students (ref: majority students). Confidence intervals at 95%. All models control for SES, gender and grades. N=1572. Full results in Table A4.

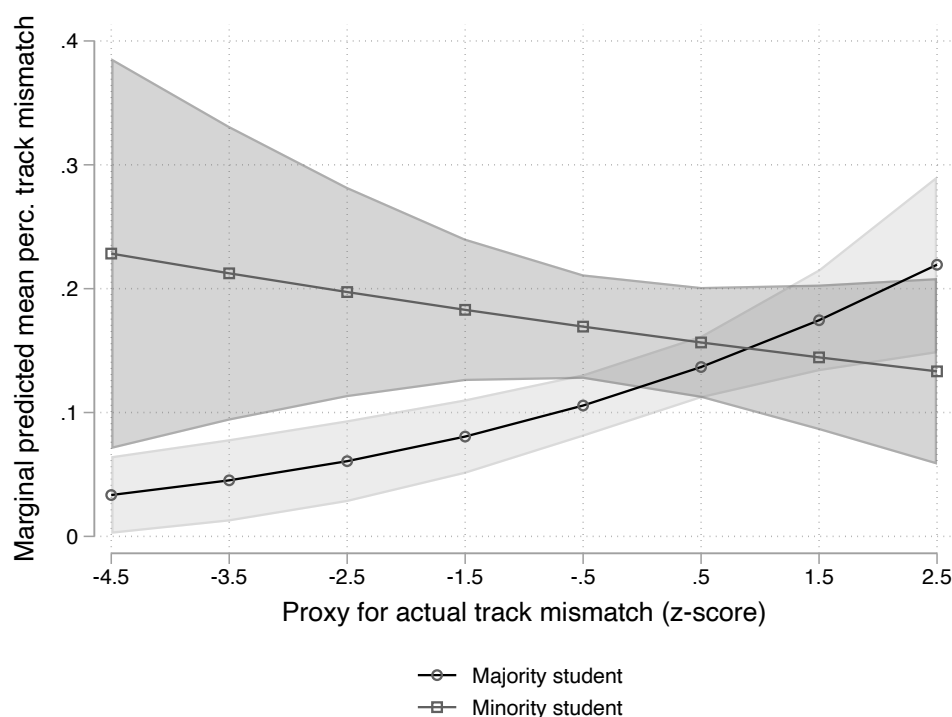
H2a postulates that minority students' more prevalent perception of belonging to a higher track reflects a greater proportion of minority students in the lowest track. To test this assumption, we include the factual track level. This changes the “perception gap” between minority and majority students only slightly, even though we have seen in Figure 1 that the main effect of this variable is pronounced. This indicates that those students who attend the lowest track experience a pronounced sense of misplacement but this is true for both minority and majority students alike.

We now turn to the role of parental aspirations (H2b). If we consider that minority parents are much more likely than majority parents to have Abitur aspirations for their children, the

observed pattern changes significantly. While parental aspirations are significantly and positively correlated with the probability of reporting a mismatch (Figure 1), the difference between minority and majority students is reduced to a considerable extent (Figure 2).

We conclude with two more fine-grained analyses. First, we look more closely at the finding that our indicator for factual track mismatch does not play a role in explaining minority students' more frequent perceptions of being on the wrong track. As a reminder, our descriptive results show that their cognitive skills as measured in the test are more often below the track average. This suggests that minority and majority students might respond differently to such a factual mismatch. We therefore model an interaction effect between minority background and proxy for actual track mismatch (see Figure 3).

Figure 3. Interaction between minority background and the proxy for actual unfair treatment

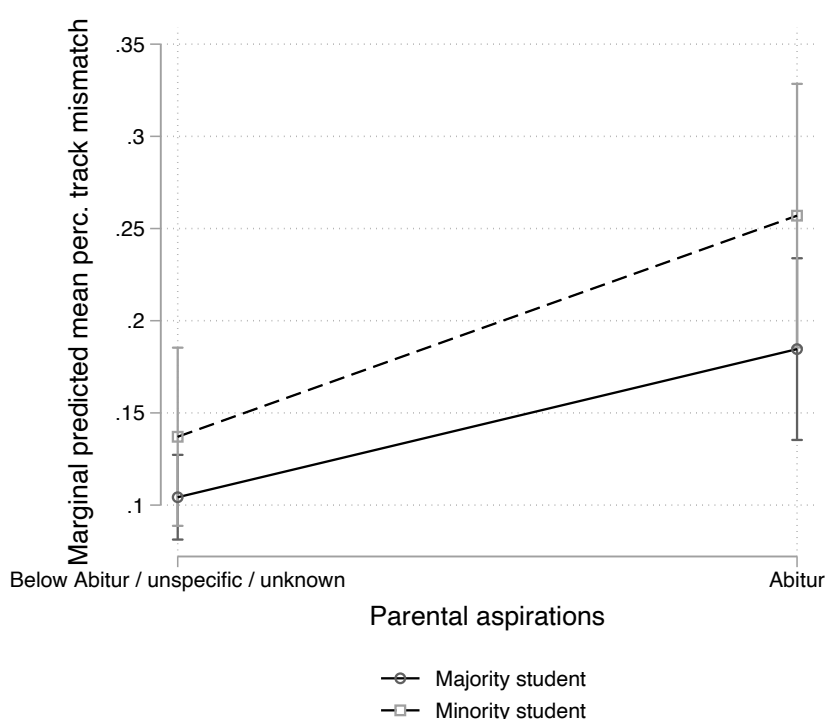


Source: PerFair data. N=1572. Includes full-model controls from Figure 2. Full results in Table A6.

Figure 3 shows a striking picture: Majority students mostly believe that they deserve to be on a higher track when their cognitive skills are above their track average (positive slope). However, minority students show a different pattern (weak negative slope): they feel that they belong on a higher track even – and by tendency: in particular – if their average cognitive skills are below their track average. We discuss this finding in greater detail in the discussion.

In Figure 4, we also take a closer look at parental aspirations that are, on average, substantially higher among minority students. By interacting aspirations with our grouping variable (majority/minority student), we assess whether they relate to students' perceptions of unfair treatment in a group-specific way. Figure 4 reveals that in both groups, students feel more often misplaced when their parents have high educational aspirations for them. Even though not statistically significant, it is notable that the increase in perceived unfairness between low and high parental aspiration is steeper among minority students.

Figure 4. Interaction between immigrant background and parental aspirations



Source: PerFair Data. N=1572. Includes full-model controls from Figure 2. Full results in Table A6.

6. Discussion and conclusion

This paper is one of the few studies that tackles educational inequality from the students' perspective. We ask how widespread students' perception is to belong on a higher track than the one they currently visit – a key indicator of educational justice (Resh & Sabbagh, 2016). Only one in ten majority students, but nearly one in four minority students, believe that they

are on the wrong track if they do not attend the academic track. Therefore, we examined how this “perception gap” between majority and minority can be explained.

First, and with regard to H1, our results suggest that minority children believe that they belong to a higher track regardless of how their cognitive ability (as measured by test data) relates to the average cognitive ability of other students on their track. Majority children, on the other hand, seem to consider more strongly whether or not their cognitive skills are actually above the average for the track they belong to. They only believe they belong to a higher track when their performance in the cognitive test was above average. We, thus, find no evidence for the “exposure mechanism”.

Second, we examine whether minority students are in a greater need to blame their lack of educational success for unfair treatment (“ex-post rationalization of failure”). We tested a more and a less direct version of this assumption. On the one hand, we simply assessed whether minority students more often feel treated unfairly because they visit the lowest educational tracks more often (H2a). This mechanism plays a role for both majority and minority students and also reduces the “perceptions gap” between these groups to a certain extent. This gap significantly shrinks if we take into account that immigrant parents have much higher educational aspirations. Obviously, minority children cope with not being able to achieve these ambitious educational goals by attributing it to unfair treatment (as hypothesized in H2b). Further research is needed to explain the perception gap that remains even after taking into account the theoretical mechanisms considered in this paper.

While our study is innovative in using data from the PerFair project that looks into subjective perceptions of inequality at school, our findings entirely align with previous literature on ethnic educational disparities. These studies not only show that immigrant parents have high educational aspirations, but they also suggest that these may reflect “immigrant optimism” and a lack of knowledge. As Zerrin Salikutluk put it, immigrant children “underestimate the requirements of attaining high degrees” (Salikutluk, 2016, p. 583). This supports our finding that minority students’ perceptions of unfair treatment might be less grounded in reality, at least when it comes to an alleged misallocation to a school track that is too low, given their cognitive skills as measured by test data.

The consequences are ambivalent. Minority students aim high, even if their parents have low levels of educational attainment, which is good news. While for many non-immigrant parents it seems above all important that their children reach their levels of educational attainment, immigrant children fortunately ask for more. While this often leads to ambitious educational choices, it does not necessarily put students on a path to success. In many cases, “back to square

one," or dropping out, is unfortunately the more likely outcome (Dollmann & Weißmann, 2020). In line with this, some authors have pondered whether a higher level of perceived ethnic discrimination among grown-up children of immigrants is an "unanticipated downside of immigrant optimism," especially among those who did not live up to their parents' educational attainment (Schaeffer, 2019, p. 77).

Our study faces several limitations. First of all, the PerFair survey was conducted in only three German federal states. While there is no reason to assume that our general finding would look different in other states, large German representative educational studies, such as the National Educational Panel Study, would need to incorporate survey questions on students' subjective perceptions of fairness to replicate our findings. Secondly, our case numbers are not large enough to differentiate between children of the first and second generation or by country of origin. However, the high aspirations of minority students have been confirmed by many other studies that were able to look into them in a more fine-grained way (e.g., Becker et al., 2022). Finally, we cannot completely rule out the possibility that the cognitive ability tests we used are culturally biased in the sense that they are less reliable in capturing the cognitive abilities of minority children (see the Methods section).

In terms of policy recommendations, our results are challenging. As spelled out in the introduction, perceived unfair treatment can have quite adverse motivational and behavioral consequences. Nevertheless, informing students about the actual requirements for succeeding at higher tracks with the goal to discourage them to "aiming high" is certainly no solution for ethical reasons and vis-à-vis the substantive ethnic educational inequalities in Germany. Indirectly, our finding that minority students are less likely than majority students to be on a track that is below their measured cognitive skills may even suggest that teachers take minority students' aspirations for ambitious tracks into account when issuing their recommendations (Borgna & Contini, 2021). An alternative explanation is that minority students move on to more ambitious tracks even without such recommendations (see e.g. Gresch, 2012 for some support of this). In any case, ensuring that minority students who make it to the more challenging tracks ultimately achieve their ambitious educational goals, despite the many challenges they face, remains an unmet challenge to date.

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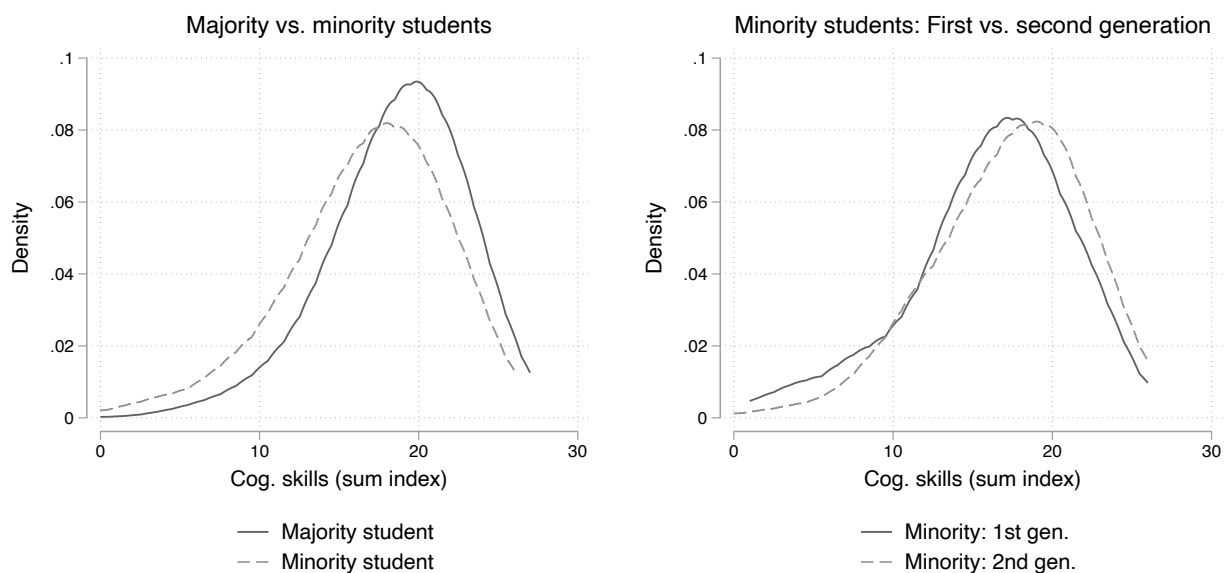
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Appendix

Figure A1. Kernel density plots for cognitive skills distribution between minority and majority students.



Source: PerFair data.

Table A1. Detailed coding of school track and perceived track mismatch.

<i>Federal state</i>	<i>School track (German designation)</i>	<i>School track (English translation)</i>	<i>Between- (BST) or within-school track (WST)</i>	Perceived track mismatch			
				<i>Lowest track</i>	<i>Inter- mediate track</i>	<i>Compr. school</i>	<i>Academic track</i>
Baden-Wuerttemberg	Haupt-/Werkrealschule	Lower secondary school	BST	X	Y	Y	Y
	Realschule	Intermediate secondary school	BST		X		Y
	Gemeinschaftsschule	Comprehensive school (<u>with and without</u> access to academic tracks)	BST			X	Y
	Gymnasium	Upper secondary school	BST				Z
Saxony	Hauptschulbildungsgang Oberschule	Combined lower and intermediate secondary school: Lower track	WST	X	Y		Y
	Realschulbildungsgang Oberschule	Combined lower and intermediate secondary school: Intermediate track	WST		X		Y
	Gymnasium	Upper secondary school	BST				Z
Schleswig-Holstein	Gemeinschaftsschule ohne Oberstufe	Comprehensive school (<u>without</u> access to academic tracks)	WST		X	Y	Y
	Gemeinschaftsschule mit Oberstufe	Comprehensive school (<u>with</u> access to academic tracks)	WST			X	Y
	Gymnasium	Upper secondary school	BST				Z

Legend: *X*=current track, *Y*=desired track, *Z*=excluded. Note: For the analyses, intermediate tracks and comprehensive schools are combined in one category.

Table A2. Average cognitive skills by track

<i>Federal state</i>	<i>School track</i>	<i>Average cog. skills</i>
Baden-Wuerttemberg	Low track	15.05
	Intermediate track	17.11
	Comprehensive schools	14.78
	Academic track	20.00
Saxony	Low track	15.61
	Intermediate track	17.55
	Academic track	20.68
Schleswig-Holstein	Intermediate track	17.00
	Comprehensive schools	17.37
	Academic track	21.05

Source: PerFair data. Note: Shows the mean level of cognitive skills by school track by federal state. Based on full sample (including academic-track schools).

Table A3. Sample size and exclusion of missing values.

	<i>N missing values</i>	<i>N remaining cases</i>
Original sample		3119
Exclusion of academic-track students	1284	1835
Item-Nonresponse on DV	263	1572
Remaining item-nonresponse on IVs (imputed)	273	1299
Analytical sample		1572

Table A4. Tabular results for Figure 2 on explaining differences in perceived track mismatch between majority and minority students. Two-level logistic regression (AMEs).

	M1: Base model	M2: + Actual unfair treatment	M3: + Ex- Post 1	M4: + Ex- Post 2 (Full model)
Minority student	0.09*** (0.03)	0.10*** (0.03)	0.07** (0.02)	0.05* (0.02)
Proxy for actual track mismatch (z-score)		0.02** (0.01)	0.02* (0.01)	0.02* (0.01)
Lowest track			0.31*** (0.05)	0.34*** (0.05)
Parental Abitur aspirations				0.09*** (0.02)
SES: No parent univ. educ.	-0.02 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.01 (0.02)
SES: Missing	0.00 (0.02)	0.00 (0.02)	-0.01 (0.02)	0.00 (0.02)
Boys	-0.00 (0.02)	-0.00 (0.02)	-0.01 (0.02)	-0.01 (0.02)
(Lower) grade German	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
(Lower) grade Math	-0.02* (0.01)	-0.01 (0.01)	-0.02* (0.01)	-0.02+ (0.01)
Observations	1,572	1,572	1,572	1,572

Source: PerFair data. Note: Standard errors in parentheses, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$

Table A6. Tabular results for Figure 3 and 4 (Interaction effects). Log-odds.

	(1)	(2)
Minority student	0.43* (0.21)	0.38 (0.28)
Proxy for actual track mismatch (z-score)	0.35** (0.11)	0.17* (0.08)
Minority student X proxy for actual track mismatch track	-0.47** (0.17)	
Parental Abitur aspirations	0.88*** (0.20)	0.81*** (0.24)
Minority student X parental Abitur aspirations		0.15 (0.40)
SES: No parent univ. educ.	-0.14 (0.21)	-0.15 (0.21)
SES: Missing	0.06 (0.23)	0.01 (0.23)
Boys	-0.08 (0.18)	-0.05 (0.18)
(Lower) grade German	-0.14 (0.12)	-0.14 (0.12)
(Lower) grade Math	-0.21* (0.10)	-0.19+ (0.10)
Lowest school track	2.32*** (0.30)	2.31*** (0.30)
Constant	-1.96*** (0.36)	-1.89*** (0.36)
Variance class level	0.64** (0.23)	0.62** (0.22)
N (students)	1,572	1,572
N (classes)	125	125

Source: PerFair data. Note: Standard errors in parentheses

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