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

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ABSTRACT

This paper explores why ethnic minority students are more likely than majority students to believe that they should attend a higher educational track. Based on a survey of seventh-grade students in Germany, we examine two explanations for this "perception gap." First, minority students may be more likely than majority students to be placed in a track that is too low for them ("exposure" to unfair treatment). Second, minority students, who are more frequently enrolled in the lowest educational tracks and are often the children of highly ambitious parents, may feel a greater need to attribute limited educational success to unfair treatment in order to protect their self-esteem ("ex-post rationalization of a lack of success"). We find little evidence for the "exposure" mechanism. Instead, the "perception gap" between majority and minority students largely reflects their more frequent enrollment in the lowest, stigmatized track of the education system and their parents' high, unmet educational aspirations.

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

Pronounced ethnic inequalities can be found in many countries and have received considerable attention in educational research. In Germany, the 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 (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 (Bonefeld et al., 2017; Krause et al., 2015). They attend lower educational tracks (Krause et al., 2015) than majority members and reach lower levels of educational attainment (Diehl & Granato, 2018).

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, such as a lower proficiency in the host language (Kempert et al., 2016), teacher bias, and discrimination (Sprietsma, 2013; Wenz & Hoenig, 2020). On the positive side, it has been shown that minority students have high educational aspirations (Dollmann & Weißmann, 2020; Salikutluk, 2016).

This paper addresses a question that has received surprisingly little attention, especially in quantitative research: Do minority students feel treated unfairly more often 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 issues less in terms of justice than in terms of effectiveness" (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). Perceived unfairness in school is negatively related to students' educational achievement (Chen & Cui, 2020; Mikk et al., 2016), motivation (Berti et al., 2010), academic self-concept, interest in a task, and eagerness to do well (Helm et al., 2020). It is associated with lower aspirations for higher education, lower post-secondary enrollment, lower life satisfaction in later years (Grew et al., 2024), and comes along with a strong sense of not belonging (Resh & Sabbagh, 2014). Perceived unfairness has also been linked to engagement in bullying behaviors (Lenzi et al., 2014; Molinari et al., 2013). Outside school, these perceptions have been negatively associated with democratic attitudes and social, institutional, and political trust (Resh,

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2018; Resh & Sabbagh, 2016, p. 362).

As an indicator of perceived unfair treatment, we focus on perceived track mismatch, i.e., students' subjective perceptions that they belong to a higher educational track than the one they are currently attending. Educational tracking, i.e., the early assignment of students to different school tracks based on ability (Hallinan, 2000), has received much attention in the academic and societal debate on educational inequality. In the highly-tracked German system, track assignments based on teacher recommendations take place quite early, when children are about nine years old, potentially disadvantaging children who are late entrants to the education system (Buchmann & Park, 2009, p. 249). These recommendations 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. 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 partly biased, especially against children from lower educational backgrounds, ethnic minority students, or boys (Bonefeld & Dickhäuser, 2018; Dudas, 2014; Maaz et al., 2011). Apart from these specific questions about the fairness of track recommendations, there are other reasons to expect that immigrant children feel more often unfairly treated in school than majority students. Some studies suggest that minority students may receive lower grades than their peers with similar performance and ability, and that teachers' assessments of their academic abilities may be biased (Sprietsma, 2013, Wenz & Hoenig, 2020). Others point to institutional discrimination, such as a low proportion of immigrant teachers and a resulting lack of role models, or the way immigrant students are portrayed in textbooks (Georgi, 2024). At the same time, immigrant families "aim high" in terms of education. The discrepancy between desired educational careers and limited educational success, as well as the empirical evidence of unfair treatment of minority students in the school system and the negative consequences of these perceptions, makes it worthwhile to investigate how children perceive and experience unfair treatment in terms of track enrollment.

To explore students' perceived track mismatch, we use innovative data from a large project on "Students' Perceptions of Inequality and Fairness in School and Society" (PerFair), collected in 2022/23 in three German federal states. In short, our findings reveal that minority students who attend lower or intermediate tracks of the German education system are more likely than comparable majority students to believe that they have ended up on the wrong track. We test two general theoretical mechanisms that may explain this "perception gap" between majority and minority students. The *first* mechanism considers the possibility that students may experience more unfairness when they are assigned to an educational track ("exposure"). The other mechanism focuses on people's tendency to attribute a lack of success to external causes, even in the absence of unfair treatment in a given situation ("ex-post rationalization of a lack of success"). One manifestation of this mechanism is based on the "information deficit hypothesis" (Becker & Gresch, 2016; Kao & Tienda, 1998; Relikowski et al., 2012), which suggests that minority students may be more puzzled by ending up in a lower track because they are less informed about the specific requirements for entering higher tracks. The other manifestations center around students' responses to high but, to different degrees, unmet parental expectations (Schaeffer, 2019).

Our results challenge the notion of an "exposure" mechanism: We find no evidence that the gap in fairness perceptions between minority and majority children is driven by those minority students who are unfairly placed in a track that is too low for their abilities and performance. Rather, while majority students perceive a track mismatch when they have above-average skills and grades, this perception also prevails among minority students with average or below-average skills and grades. In addition, minority students are more likely to have parents with high educational aspirations – and to attend the most stigmatized, lowest track of the education system.

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

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 (Resh & Sabbagh, 2016, p. 230). Moreover, in the literature on students' perceptions of fairness in school, just teacher-student relationships and grades have received the most attention among the various rewards distributed in this context (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.

This is surprising, as the "objective" 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 change to more challenging tracks later on, it is usually the more privileged students who manage to do so (Biewen & Thiele, 2020; P. Blossfeld, 2018; and Schindler, 2017 for long-term track mobility effects on social inequalities in educational attainment).

A suitable theoretical framework for analyzing students' perceptions of unfair treatment is provided by the literature on perceived discrimination among ethnic and racial minorities (for a review, see Schaeffer & Kas, 2023). [1] It starts out from the fact that perceived unfair treatment is different from actual unfair treatment (Small & Pager, 2020). 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, to varying degrees, both "exposure" to actual unfair treatment and attributions of negative experiences to unfair treatment, even in those cases where it didn't happen.

This, in relation to our research question, implies that minority students may have been placed on a track that is too low given their abilities, performance, and behavior. In line with the literature mentioned above, we call this mechanism "exposure" (to unfair treatment). However, since it is difficult for the individual child to judge whether they have actually ended up on the right educational track, we also consider alternative explanations for why students may believe that they should be enrolled in a higher track, even if there is no direct empirical evidence for this. Most importantly, more minority than majority children may feel a need to explain why they did not end up on the highest educational track in a self-protective way (Thijs & Piscoi, 2016), i.e., by ascribing it to external causes such as allegedly unfair treatment. We call this mechanism the "ex-post rationalization of a lack of success" (Schaeffer, 2019, p. 67) and describe different manifestations of it in the following sections.

[1] In this article, we use the term "perceived unfair treatment" rather than "perceived discrimination". The term discrimination ("the difference between the treatment a target group actually receives and the treatment they would receive if they were not members of the target group but were otherwise the same", Quillian, 2006, p. 302) refers more narrowly to the perception that unfair treatment is related to one's membership in a disadvantaged group. We do not know whether minority students believe that they have been assigned to the wrong educational track because of their group membership, only that they believe that they belong to a higher track, that is, that they have not received a fair return for a given input in terms of Equity Theory (Adams, 1965).

3. The "exposure" mechanism

According to previous research, minority students could be more likely than majority children to be exposed to unfair treatment in the sense of being misplaced in lower tracks of the education system.

3.1. Unfair enrollment in lower tracks: the role of biased teacher recommendations

Teachers have some leeway in assessing and grading students and making track recommendations since neither grades nor track recommendations are based on standardized tests in Germany. Track recommendations are more susceptible to teacher bias than grading processes because they require long-term expectations rather than short-term evaluations (Wenz & Hoenig, 2020). This involves more uncertainty, making statistical discrimination more likely (Arrow, 1998). In the school context, this might imply that track evaluations are based less on actual performance and more on stereotypical assumptions about group differences in ability, effort, and classroom behavior.

Several studies have analyzed whether track recommendations are fair by comparing the likelihood of receiving a recommendation to attend the highest track between children of non-academic or immigrant parents to peers with academic or native-born parents – at equivalent levels of achievement (for a review see Batruch et al., 2023; see also Dollmann, 2025; Lorenz et al., 2016; Wenz & Hoenig, 2020). For the German context, this research suggests that, at the same level of achievement, children of educated parents — a group in which minority children are underrepresented — are slightly more likely to receive a recommendation for the highest educational track (Dudas, 2014; Dumont et al., 2019; Maaz et al., 2011). The evidence on additional disadvantages for minority children is mixed, with most studies finding no and some even a positive ethnic bias in track recommendations after controlling for grades and socioeconomic background. However, some studies indeed find evidence for a negative bias, mostly those based on experimental data (Batruch et al., 2023). One explanation for such 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 work and learning patterns ultimately influence success in secondary school, many minority children have acquired their skills against greater resistance. Teachers who predominantly come from ethnic majority families may not reward this accordingly (Rotter, 2015).

Studies beyond the German context find some support for this, but the overall findings are again mixed. Data on Spain suggest that historically disadvantaged groups, such as low SES children and minority children, but also boys, receive recommendations that reflect stereotypical assumptions about these groups' effort and behavior (Gil-Hernández et al., 2024). These mechanisms align with qualitative research findings from Italy, indicating that teachers often hold somewhat paternalistic attitudes toward minority children, assuming they may feel "out of place" in upper secondary schools. At the same time, parents from minority backgrounds are generally less equipped than their middle-class counterparts to effectively communicate their high educational aspirations to teachers or to challenge course recommendations that do not reflect those goals (Bonizzoni et al., 2016). However, other studies – also set in the Italian context – suggest a contrasting view: some teachers actually anticipate and acknowledge parents' strong educational ambitions (Borgna & Contini, 2021). Research on long-term trends in track recommendations shows that minority students in the Netherlands receive higher track recommendations, which is linked to their parents' high educational aspirations. Over time, however, majority children are catching up, and these immigrant-native gaps are closing, a trend the authors attribute to minority children no longer being perceived as a target group for positive discrimination (Timmermans et al., 2018).

Overall, some, but not all, studies suggest that, at the same levels of ability and performance, there are relatively small differences in track recommendations based on socioeconomic or ethnic background to the detriment of students from parents with low levels of formal education and minority parents. As a result, more minority children may end up – and thus correctly assume – that they are enrolled in tracks that are too low for them.

H1. Minority children perceive a track mismatch more often than majority children because they are more likely to attend a track that is too low for them.

4. The "ex-post-rationalization of a lack of success" 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 that may explain why a lack of success is sometimes blamed on unfair treatment even if it actually reflects other factors. In the following, we describe several possible manifestations of this mechanism.

4.1. Information deficit

According to the literature on ethnic educational inequality, many immigrant families tend to be less familiar with the institutions in the reception context and have limited access to information about how to succeed (Zimmermann, 2024). This argument lies at the heart of the so-called "information deficit hypothesis", according to which immigrant parents are more likely to misjudge "their child's academic performance due to the parents' low familiarity with the German school system" (Blossfeld & Nester, 2024). Qualitative research on Turkish families has also shown that when parents decide on the right school track for their child, immigrant parents focus less on their actual performance than majority parents (Relikowski et al., 2012). Similarly, minority children appear to be less familiar with the requirements for achieving high levels of educational attainment (Salikutluk, 2016).

Consequently, minority students may be more puzzled about why they ended up in the lower track of the education system. For those who are less well informed about the relevant factors for tracking decisions, unfair treatment is a more obvious ex-post rationalization for attending the lower educational track than for those who are well-informed about the requirements. As a consequence, majority children should mostly feel misplaced when there is actual evidence that they ended up "on the wrong track," whereas minority students could feel treated unfairly even in the absence of such a factual mismatch.

H2. Minority children perceive a track mismatch even if they attend a track that aligns with their actual abilities and performance.

4.2. Enrollment in a stigmatized track

In general, students on the lowest tracks of the education system may feel a greater need to attribute their enrollment in a lower school track externally. In Germany, the lowest track is called *Hauptschule* and is highly stigmatized in the sense that students are perceived as less gifted and motivated (Bardach et al., 2023; Völcker & Hansen-Schaberg, 2016). Track-related stereotypes are internalized by students and have negative consequences for their self-appraisals and self-evaluations (Van Houtte, 2016; Van Praag et al., 2017). As a result, enrollment in the lowest tracks of the education system may be perceived as a "failure" and lead to frustration, a greater sense of futility, i.e., the sentiment of not being in control of one's educational career, and feelings of "being stuck" (Van Houtte, 2016; Van Houtte & Stevens, 2008). Only a small and decreasing share of less than 10 % of German students attend this track nationwide (Statistisches Bundesamt, 2023). Moving up to the Gymnasium at a later stage of the educational career is also less likely from the lowest track of the educational system than from the middle

tracks (Bellenberg, 2012; Statistisches Bundesamt, 2011).

In Germany, minority children are not only less likely to attend the academic track that leads to the entry exam for the university, but also more likely to attend the lowest school track (Bach et al., 2024). Therefore, they may feel a greater need to attribute enrollment in this stigmatized track to unfair treatment, and deal with it in a way that protects their self-esteem.

H3. Minority children perceive a track mismatch more often than majority children because they attend the lowest tracks of the education system more often than majority children.

4.3. High parental aspirations

Educational aspirations, i.e., the highest educational levels students (or the parents) wish (for their children), differ not only by their socioeconomic background. They are also higher for minority than for majority parents, a phenomenon that has received a great deal of attention in research on ethnic educational inequality (Becker et al., 2022; Becker & Gresch, 2016; Zimmermann, 2019). One crucial explanation for socioeconomic status differences in educational aspirations is the status maintenance motive, i.e., parents desire that their children maintain their own educational level (Breen & Goldthorpe, 1997). Children aim to conform to 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, particularly the devaluation of resources such as education, language skills, and social capital, many immigrants are unable to meet these ambitions and pass on their high and unfulfilled educational aspirations to their children. Moreover, many immigrants from countries with generally lower levels of education and limited opportunities for upward mobility had above-average educational attainment in their country of origin. As a result, their relative level of education before migration was high, even if their absolute level of education (e.g., in terms of years of schooling) after arrival in the host country is comparatively low (Engzell, 2019; Spörlein & Kristen, 2019). Thus, minority children may feel a stronger pressure than majority children to surpass their parents' educational attainment and to regain the class positions that their families lost through migration. In fact, minority students choose more challenging educational pathways than majority children of the same achievement level, although this does not necessarily lead to higher completion rates (Dollmann & Weißmann, 2020).

The argument that minority members' perceptions of unfair treatment reflect unfulfilled mobility aspirations has been formulated and empirically tested in a study that aims to explain variance in perceptions of discrimination among second-generation immigrants in Germany more generally. "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). In fact, perceptions of discrimination are pronounced among German-born adult children of immigrants with lower levels of educational attainment than their parents (ibid.). A similar argument may apply to children who fail to live up to their parents' ambitious educational aspirations. Since minority students are more likely than majority students to have parents with *Abitur* aspirations, those not enrolled in the highest track of the education system may more frequently experience a need to "ex-post rationalize" this by attributing their track placement to unfair treatment.

H4. Minority children who do not attend the highest educational track perceive a track mismatch more often than majority children because they are more likely to have parents with *Abitur* aspirations.

4.4. Pronounced "aspiration squeeze"

Finally, the previous two mechanisms may interact in the sense that it is not so much attending the lowest track of the education system *per se* that leads to the perceptions that this enrollment is unfair. In fact, it might be problematic to assume that students enrolled in the lowest track per se perceive this as some sort of failure that requires justification. Rather, this might be the response to a specific combination of attending the lowest school track and having parents with the highest, i.e., *Abitur*, educational aspirations. Minority children may experience this largest possible discrepancy between the track attended and the track aspired by their parents ("aspiration squeeze") more often than majority students (Engzell, 2019). As a consequence, more students in this group may feel the need to ex-post rationalize a lack of success to unfair treatment in a self-protective way.

H5. Minority children perceive a track mismatch more often than majority children because the gap between parents' *Abitur* aspirations and the attended track is larger for minority students than for majority students.

5. Perceived track mismatch in the German context

We study perceived track mismatch in the German education system, which is known for its highly pronounced tracking system. Sorting into separate school tracks starts early (after grade four in almost all German federal states) 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 tracks *(Gymnasium)*. The latter opens the way 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, students are highly aware of the track levels they are placed in, especially compared to systems with less pronounced tracking (Legette, 2020). Both observations make Germany an interesting case for analyzing perceived track mismatch, as it can be assumed that in cases of mismatch and with fewer opportunities to change tracks, once enrolled in a lower track, students may be more frustrated compared to countries with more flexible tracking practices (note, however, that minority students are more likely to use these opportunities, see Dollmann & Weißmann, 2020).

6. Data and methods

6.1. Data

We use novel data from the "Students Perceptions of Inequality and Fairness" (PerFair) project, a survey of seventh-graders in three German federal states (Baden-Wuerttemberg, Saxony, and Schleswig-Holstein).[2] The types of school tracks vary somewhat by federal state, although in all three states, tracking occurs after grade four, and teacher

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

recommendations are not binding, i.e., the final decision for a particular school track is made by the parents. In Baden-Wuerttemberg and Saxony, a certain grade point average is required to receive a teacher recommendation for academic tracks (for more details, see Tables A1 and A2 in the Appendix).

The most important aim of the PerFair project is to describe and explain how perceptions of educational and social inequality and fairness 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 (November 2022 – June 2023).[3] The sampling procedure followed a 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).[4] Second, in order to achieve a proportional representation of minority students 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, 3116 students in 200 classes and 78 schools participated in the survey.[5]

6.2. Measurements

To construct our dependent variable, *perceived track mismatch*, we first code students' actual track level position in the three federal states. We code school tracks according to the four categories: lowest school track, intermediate track, comprehensive school, and academic track. Second, we measure perceived track mismatch by the survey item asking students, "Do you think another type of school would suit you better?"[6]; Students could answer with "no" or "yes" while also indicating which track they would find more suitable. Students who indicated that a higher track 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 A3 in the Appendix for more details on the coding). Note that since we are observing seventh-graders, students have been attending their tracks for at least two years and may have already adjusted to their track placement. As a result, we may even be underestimating perceived track mismatch.

Students already attending the highest educational track cannot perceive a track mismatch according to our definition and were, thus, excluded from the analyses. Students attending comprehensive schools (with and without access to an academic track) in Baden-Wuerttemberg are coded as perceiving a track mismatch only if they wish to attend a *Gymnasium*. For Schleswig-Holstein, we treat students in comprehensive schools without access to an academic track as having a perceived track mismatch if they wish to attend comprehensive schools with access to the academic track (or a *Gymnasium*).

For measuring *minority background*, we group together first- and second-generation minority students as the number of cases is otherwise too low. First-generation minority students are children born abroad with two parents born abroad, including interethnic cases where one parent was born in Germany but the child abroad.[7] Second-generation minority students are children born in Germany while both parents were born abroad. Our theoretical considerations apply to both groups and case numbers do not allow for a more fine-grained differentiation (but see Figure A1 for the distribution of the country of origin of first- and second-generation minority students of the PerFair sample). Students who were born in Germany and have German-born parents are defined as majority students and included in the reference category.[8] Second-generation minority students with only one parent born abroad (i.e., the interethnic second generation) are defined as majority students. These students are 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 actual 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. In some German federal states, teachers have to follow grades rather strictly when they issue their track recommendations. However, they are also encouraged to consider other factors, such as students' cognitive potential. 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 might 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 definitely decide whether a student actually attends an unfairly low track with the data at hand. We therefore use a proxy variable and calculate whether a students' cognitive skills, as measured in the PerFair survey, 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 A2 in the Appendix), which is not a peculiarity of our data (see e.g., Rosselli & Ardila, 2003). One possible reason for this finding is that the test might not be as "culture fair" as intended. Rather, the test 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).

The average cognitive skill levels by school-track type are calculated for each federal state. Afterward, we calculate each student's *cognitive skill deviation from the attended track average*, which is used as a proxy for actual track mismatch. We group this information into three categories: (1) Students who are at least one standard deviation below the track average (the reference category), (2) those that are around the track average, and (3) students having skills at least one standard deviation above the track average. Note that the last group represents students who seem to have been assigned to a track that is too low for them, given

[3] The survey was implemented by the IEA Hamburg, for more details see Table A4 in the Appendix.

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

[5] See Table A4 in the Appendix for the student response rates by school type and some additional information on the recruitment process.

[6] Prior to the question on perceived track mismatch, students were asked what track they currently attend in order to elicit a very general perception of how the track they attend fits them. To avoid any misunderstanding of this question (e.g., as referring to a particular school rather than a particular track), the response categories of the state-specific tracks were repeated in the question.

[7] Children with missing birth origin are also coded as first generation when both parents were born abroad.

[8] Majority students also include children with missing birth origin when both parents were born in Germany, or when one parent is German and the other's birth origin is missing.

their cognitive abilities. When interpreting the coefficients of the cognitive skill deviation, it is important to remember that what matters are the differences between majority and minority students in how that deviation above the track-average relates to perceived track mismatch. To test the robustness of our findings for cognitive ability, we additionally use alternative proxies for actual track mismatch by calculating the deviation of language skills and grades from the average of the school track (see Figure A4 in the Appendix).[9]

To test H2 regarding the information deficit, we calculate an interaction effect between the proxy of actual track mismatch, as outlined above, and minority background. We expect minority students to perceive a mismatch even in the absence of empirical evidence of actual mismatch and interpret this as indirect evidence that they are less well informed about the role of actual abilities and performance in track assignments.

The current school track is key in testing H3 and indicates whether students attend the lowest tracks versus the intermediate tracks or comprehensive schools (reference category, see Table A2 for details on the coding). To test H4, we 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 indicate that their parents wish the *Abitur* for them, which is the highest school certificate in Germany, are coded as having parents with high educational aspirations. Parental aspirations towards lower educational degrees and indifferent aspirations[10] are coded as having parental aspirations below the *Abitur*.[11]

Finally, to test H5 ("aspiration squeeze"), we will assess whether the combination of being enrolled in the lowest track and having parents with *Abitur* aspirations, a combination that we expect to lead to a pronounced need to attribute this mismatch to unfair treatment, is more common among minority children. Technically, we will estimate the interaction between the track attended and the parental *Abitur* aspirations. H5 is considered supported if the perception gap is partly explained by minority students on the lowest track, and whose parents have *Abitur* aspirations.

In all models, 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 voluntarily filled out a parent questionnaire that students handed over to their parents. We could draw from both questionnaires to obtain the parents' highest educational degree.[12] We impute cases where information on parents' education is still missing. The final variable thus indicates whether a student has at least one parent with a university degree (reference category) or parents without a university degree. Additionally, we control for gender (see Table 1 for a descriptive summary of variables).

6.3. Analytical strategy

After excluding students in the highest school track,[13] the number of cases amounts to 1835. Of these students, 263 have a missing value on the dependent variable. The final analysis sample is N = 1572 students (see Table A8 in the Appendix), of which we impute missing values of the independent variables (N = 711). Our dependent variable is binary and we apply linear-probability models (LPM, Wooldridge, 2010: pp. 562–565). The estimated coefficients 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, we apply cluster-robust standard errors in order to address the problem of heteroscedastic errors in LPMs and to account for the nested data structure in school classes. As indicated above, in order to account for item non-response, we employ multiple imputations by chained equations on all independent variables (Azur et al., 2011). With this approach, 30 imputed datasets are created (von Hippel, 2018, 2020) on which the combined point estimates and standard errors are calculated using Rubin's rules (Rubin, 1987) in order to adjust for the variability across these imputations.

7. Findings

Table 1 provides some descriptive insights. 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 (24 percent compared to 10 percent of majority students, i.e., a gap of 14 percentage points).

Majority and minority students markedly differ in terms of the three variables assumed to explain the perceived track mismatch according to our theoretical framework, i.e., cognitive ability relative to the track average (H1 and H2), actual school track attended (H3 and H5), and parental *Abitur* aspirations (H4 and H5). Keep in mind that all these percentages only refer to students who do not attend the highest track. Concerning the deviation of cognitive skills from the track average as measured in the test – and being aware of the caveats discussed above – minority students more often score below the track average than majority student (18 percent vs. 13 percent), while majority students more often score slightly above the track average than minority students (14 percent vs. 12 percent). Moreover, more minority than majority students attend the lowest tracks (25 vs. 8 percent). There is also a significant discrepancy between the *Abitur* aspirations of minority and majority students' parents. Notably, 54 percent of minority students' parents aspire for their children to obtain an *Abitur* degree, whereas only 28 percent of majority students' parents share this aspiration. Being in the lowest track with parents who aspire for their children to obtain an *Abitur* degree is almost exclusively found among minority students (10 percent versus 1 percent). The share of students whose parents did not

[9] For calculating the deviation of grades, we use self-reported grades in math and German (last school year) and calculate the mean over both indicators. Note that we reversed the German coding of grades (higher values indicate better grades). For language skills, we combine two objectively measured tests values: (1) a vocabulary test (DIALANG) and (2) a reading test (*C*-Test). See Figure A3 in the Appendix for the descriptive distributions of grades and language skills by minority background. In Table A5 we provide the descriptive patterns on how the average cognitive skills, grades and language skills vary by school track in each federal state. Table A6 provides the descriptive statistics for these alternative proxies.

[10] We coded students whose parents did not express clear wishes for their children's educational attainment as having parental aspirations below the *Abitur*, as this may indicate that such parents do not express these wishes to their children. We conduct sensitivity analyses on excluding these cases (see Figures A5 and A6 as well as Tables A11 and A12 in the Appendix). Results show that students' characteristics do not differ much when excluding these cases, only the discrepancy between parental aspirations between minority and majority students is higher in this sample. However, the results remain the same.

[11] Around 16 percent of students (N = 506) did not know their parental aspirations or had a missing value on this item, which we impute for the analysis.

[12] We use information from parents' questionnaires and in cases of missing values, from students' responses. We also include cases when information on one parent was missing: When one parent had university education, this student was coded as having at least one parent with university education and otherwise as having no parents with university education.

[13] We provide descriptive statistics on academic-track students in Table A7 in the Appendix.

Table 1
Descriptive Statistics (N = 1572).

	Univariate distribution					Bivariate distribution	
	Min.	Max.	Mean/Prop.	SD	N of Obs.	Majority student	Minority student
Perceived track mismatch	.00	1.00	.13	.34	1572	.10	.24
Minority student	.00	1.00	.21	.41	1517		
Cog. skill dev. from school track					1533		
Cog. skill below track average (≤1 SD)			.15			.13	.18
Cog. skills at track average			.71			.73	.70
Cog. skills above track average (≥1 SD)			.14			.14	.12
School track: Lowest track	.00	1.00	.12	.33	1545	.08	.25
Parental *Abitur* aspirations: yes	.00	1.00	.34	.47	1265	.28	.54
Lowest-track students with parental *Abitur* Asp.	.00	1.00	.02	.16	1244	.01	.10
SES: No parent university education	.00	1.00	.61	.49	1135	.62	.57
Gender: Male	.00	1.00	.51	.50	1529	.52	.48

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

obtain a university degree is similar for majority and minority students (62 and 57 percent).

Multivariate analyses: Explaining the "perception gap" between minority and majority students

We present our results in Table 2. The base model (M0) includes only the group variable (minority vs. majority students) and control variables (SES and gender) and confirms the findings reported above: minority students believe more often than majority students that they belong to a higher track (by 14 percentage points). Note that gender and SES do not play a role at all.

In M1, we test hypothesis H1 on the exposure mechanism. Adding the proxy for *actual* track mismatch reveals that students with average cognitive skills perceive a track mismatch slightly more often ($b = .05$; $p < .10$) than the reference category of students with below-track average skills. Students whose cognitive abilities are one SD or more above-track average show an even higher perceived track mismatch ($b = .07$, $p < .05$). This is even more the case if we use the alternative proxies of actual mismatch (grades and language skills), which may send a clearer signal about students' performance (for grades: $b = .16$, $p < .001$, for language skills: $b = .14$, $p < .001$, see M1b in Table A9 and M1c in Table A10 in the Appendix). However, adding the proxy for actual track mismatch does not change the effect size of the grouping variable of minority vs. majority students, as it stays at 14 percentage points (see Table 2, M0 vs. M1). In other words, the larger perceived track mismatch among minority students cannot be attributed to an actual track mismatch as captured by our proxy variable. This also applies when using the two alternative proxies of actual mismatch (see again Tables A9 and A10 in the Appendix). We therefore do not find any support for H1 that more actual unfair enrollment of minority students in the lower tracks contributes to their higher perceived track mismatch.

In M2, we indirectly test the "information deficit" hypothesis (H2), which posits that minority students have a more inaccurate perception of the relationship between ability, performance, and track assignments than majority students. Therefore, they may feel misplaced even if their cognitive abilities are similar to or lower than those of the average student on their track. In order to test this assumption, we model an interaction effect between minority background and the deviation of cognitive abilities from the school track average. This interaction effect is negative and significant ($b = -.15$, $p < .10$) for minority students with above-track average skills compared to the reference category (majority students with below-track average skills). For an easier interpretation, we visualize the linear predictions of the interaction effect based on M2 in Fig. 1.

The graph shows a striking picture: Both majority and minority students believe that they deserve to be on a higher track if their cognitive skills are above their track average (i.e., if they are actually enrolled in a track that is too low for them in terms of our proxy indicator). However, among students with average or below-average cognitive abilities, minority students are more likely than majority students to believe that they belong in a higher educational track.[14] In support of H2, we interpret this finding as indicating that minority students are less aware of how abilities and performance relate to track assignments, leading to a more pronounced perception of unfair treatment.

Robustness analyses (see Figure A4 and Tables A9 and A10 in the Appendix) using the alternative proxies of the grade and language skill deviation show a similar though less marked pattern: Minority and majority students do not differ much when we only look at those with above-average skills and performance. In both groups, these students are most likely to report a mismatch. However, among those with average or below-average skills and performance, minority students perceive a higher mismatch than majority students. The pattern may be less pronounced for these indicators because language skills and grades are more observable for students than cognitive skills. This results in a clearer signal, reducing the information deficit.

H3 postulates that minority students' more prevalent perception of a track mismatch just reflects a larger proportion of minority students in the lowest and highly stigmatized track of the education system. To test this hypothesis, we include the current school track that the students attend in M3. This accounts for about 35 percent of the "perception gap" between minority and majority students [1- (.09/.14)]. Thus, H3 is supported.

In H4, we expect that high parental aspirations account for a higher perceived track mismatch among minority students. Including parental *Abitur* aspirations in M4 indeed additionally contributes to closing the perception gap. The main effect of minority students is reduced from .09 in M3 to .07 in M4, i.e., 25 percent of the effect size [1- (.07/.09)] can be attributed to group differences in parental *Abitur* aspirations. Therefore, we also find support for H4.

To look into the "aspiration squeeze" hypothesis (H5), we test whether a higher discrepancy between parental *Abitur* aspirations and the attended school track is more often experienced by minority students and whether this explains why they perceive a track mismatch more often. We therefore insert an interaction effect between school track and parental *Abitur* aspirations in M5. The coefficient shows only by tendency that a perceived track mismatch is highest among students attending the lowest school track and with parents having *Abitur* aspirations ($b = .07$). However, as this interaction is not statistically significant ($p > .10$), and since the coefficient for minority background does not change from M4 to M5, i.e., the perception gap does not close,[15] H5 is not supported. Overall, while we find support for most of our

[14] A likelihood ratio test applied to multiple imputed data indicates that Model 2 (including the interaction effect) provides a significantly better fit than Model 1 (without the interaction term, $p < .05$).

[15] The likelihood ratio test comparing Model 5 to Model 4 is not statistically significant.

Table 2
Explaining differences in perceived track mismatch between majority and minority students.

	M0 *Base model*	M1 *H1*	M2 *H2*	M3 *H3*	M4 *H4*	M5 *H5*
Minority student	0.14***	0.14***	0.15**	0.09**	0.07*	0.07*
	(0.03)	(0.03)	(0.06)	(0.03)	(0.03)	(0.03)
Cog. skills at track average		0.05+	0.04+	0.05+	0.05+	0.05+
		(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
Cog. skills above track average (≥1 SD)		0.07*	0.10**	0.06+	0.05	0.05
		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Cog. skills at track average X minority student			0.01			
			(0.06)			
Cog. skills above track average (≥1 SD) X minority student			–0.15+			
			(0.08)			
Lowest school track				0.27***	0.28***	0.27***
				(0.04)	(0.04)	(0.04)
Parental *Abitur* aspirations					0.07**	0.06**
					(0.02)	(0.02)
Lowest school track X parental *Abitur* aspirations						0.07
						(0.09)
SES: No parent univ. education	–0.01	–0.01	–0.01	–0.02	–0.01	–-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Gender: Male	0.01	0.01	0.01	–0.00	–0.00	–0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.11***	0.06*	0.06*	0.05 +	0.03	0.04
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
R2	0.03	0.03	0.04	0.09	0.10	0.10
R2 (adj.)	0.03	0.03	0.03	0.09	0.10	0.10
Observations	1572	1572	1572	1572	1572	1572

Source: PerFair data. N = 1572. Dependent variable: Perceived track mismatch. Linear probability models with cluster-robust standard errors at the class level. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$.

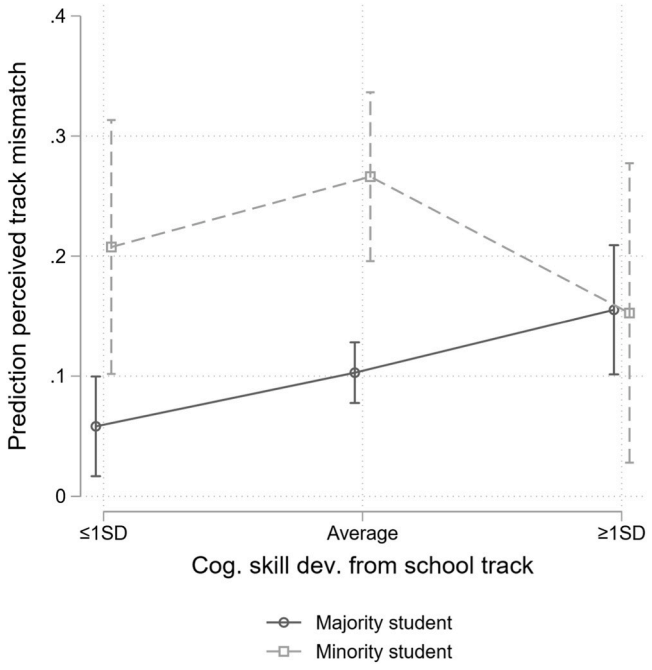

Fig. 1. Linear predictions of interaction between minority background and the cognitive skill deviation from the school track.
Source: PerFair data. N = 1572. Dependent variable: Perceived track mismatch. Linear probability models with cluster-robust standard errors at the class level. Confidence intervals at 95 %. Includes controls for SES and gender. Based on M2 in Table 2.

hypothesized mechanisms, there still remains an "unexplained" gap in this last model.

Finally, we examine how the minority student effect is attenuated across the models presented in Table 2 (M0, M1, M3, M4, and M5). To assess whether the estimated coefficients for minority students differ significantly between models, we apply a series of Wald-type tests using bootstrapped standard errors. Specifically, we use resampled datasets (with replacement) based on the imputed data and calculate *p*-values for the difference in coefficients between models (see Bittmann, 2024 for the implementation of bootstrapping with imputed data in Stata). By combining multiple imputation with bootstrapping, this approach captures within-imputation and between-imputation variability, while also quantifying sampling uncertainty, resulting in a more comprehensive assessment of uncertainty in effect estimates across models.[16]

We perform two sets of comparisons: (1) between the baseline model (M0) and subsequent models (M1, M3, M4, M5), and (2) sequentially between adjacent models (i.e., M1 vs. M3, M3 vs. M4, M4 vs. M5). Based on the imputed datasets, we do not find statistically significant differences in the effect of minority background across models. This reflects the increased uncertainty inherent in combining multiple imputation with bootstrapping, which tends to produce estimates with larger confidence intervals (Bartlett & Hughes, 2020).[17] For comparison, we repeated the same tests using unimputed data, which did not change the substantive results. However, applying Wald-tests to our unimputed data yield several significant differences: The coefficient for minority students in M0 differs significantly from that in M1 ($p < .10$), M3, M4, and M5 (each $p < .05$). Moreover, when comparing adjacent models, only the transition from M1 to M3 – where the school track is introduced – yields a significant change in the minority effect ($p < .10$). Even though some comparisons fall short of statistical significance due to the increased uncertainty of the combined approach, the pattern of results remains stable and the substantive interpretation of our findings remains unaffected and in line with our overall conclusion.

[16] We estimate all models using 1000 bootstrap replications.

[17] As suggested by the authors, we also performed the same test by bootstrapping the imputed data. Since this test is more computationally intense, we could only perform 50 replications and restrict the analysis to the comparisons of M0 vs. M1, M3, M4, and M5. These tests were also not statistically significant.

8. Discussion and conclusion

This paper is one of the few studies that explores educational inequality from the students' perspective. We ask how widespread students' perception is of belonging to a higher track than the one they are currently attending – 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 enrolled in the wrong track if they do not attend the academic track. Therefore, we examined how this "perception gap" between majority and minority students might be explained using a theoretical framework drawn from the more general literature on perceived unfair treatment. It considers such perceptions to reflect both "exposure" to actual unfair treatment and "ex-post rationalization" of a lack of success.

Regarding exposure to actual unfair treatment (H1), our results contradict the idea that it is mostly minority children with abilities exceeding their track average who believe they belong to a higher track, which is the pattern seen among majority students. Thus, we do not find evidence for the "exposure" mechanism. This does in no way imply that minority children's feelings of unfair treatment are generally unjustified. According to various empirical studies, teacher bias does exist, and many minority students experience some form of unfair treatment in school. In addition, scholars of racial discrimination have pointed out that its mere perception takes a psychological toll: "There are times when people do not know, but still wonder, whether they have been treated poorly […]. This possibility […] can cause a kind of rumination whose emotional strain can be taxing." (Small & Pager, 2020, p. 63) The same argument applies to ethnic discrimination in general and one might add: to children in particular.

Regarding the greater need of minority students to blame their lack of educational success on unfair treatment ("ex-post rationalization of a lack of success"), we tested several mechanisms. Even when their skills and performance are average or below average, minority children often think they are on a track that is too low for them. This finding indirectly supports the "information deficit" hypothesis (H2). Furthermore, we simply assessed whether minority students more often feel treated unfairly because they are enrolled in the lowest (rather than intermediate) educational tracks more often (H3). This mechanism reduces the "perception gap" between these groups to a large extent. In addition, this gap shrinks even more if we take into account that immigrant parents have much higher educational aspirations. Our findings suggest that minority children cope with not being able to achieve these ambitious educational goals by attributing it to allegedly unfair treatment (as hypothesized in H4). Finally, support for the "aspiration squeeze" hypothesis is at best weak (H5). Students in the lowest track show a tendency toward increased feelings of track mismatch in response to high parental aspirations, though this is only marginally significant and does not contribute to the perception gap between minority and majority students. After checking for several theoretical mechanisms of "exposure" and "ex-post rationalization", a "perception gap" of 7 percentage points remains. Further research is needed to explain this residual gap, e.g., by looking into school-context effects.

Although our study addresses an important yet rarely examined topic in educational research, it has several limitations. First of all, the PerFair survey was conducted in only three German federal states. There is no reason to believe that our theoretical framework does not apply to other German states or other countries with a system of early educational tracking, or that the empirical results would be fundamentally different. However, it seems worthwhile for large nationally representative educational studies, such as the National Educational Panel Study in Germany, to include questions about students' subjective perceptions of fairness, not only to replicate our findings, but also because these perceptions may have consequences beyond students' actual educational success. 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).

Despite these limitations, our findings yield some important though ambivalent practical implications. First of all, they show that the debate about the "tracked" German school system should not focus exclusively on the academic implications (see, for example, the debate between Esser & Seuring, 2020 and Heisig & Matthewes, 2022), but also on the social and psychological consequences of this feature of the German education system. Being enrolled in the lowest track is associated with pronounced perceptions of unfair treatment, while this is much less true for being enrolled in intermediate or comprehensive schools. As spelled out in the introduction, perceived unfair treatment can have quite adverse motivational and behavioral consequences, and in light of our findings, one could argue that the decision of more and more states in Germany to abandon this school type is a first step in the right direction.

Secondly, our study confirms that minority families aim high, even if immigrant parents have low levels of educational attainment. While many non-immigrant parents seem to prioritize their children reaching their level of educational attainment, fortunately, minority children ask for more. These ambitious educational choices do not necessarily lead to success, but they may be achieved later in life (Dollmann & Weißmann, 2020). After all, the German school system provides opportunities to earn an upper secondary school diploma at a later age. However, some authors have considered whether a higher level of perceived ethnic discrimination among adult 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 not only confirms previous research which shows that minority students enrolled in lower educational tracks are more likely than majority students to have parents who aspire for them to earn an *Abitur*. It also suggests that this contributes to a more frequent perceived mismatch of students with their tracks. While discouraging immigrant parents from aiming high may seem like an "easy fix" for their children's perception of being treated unfairly, this would certainly be no solution for normative and ethical reasons – and in light of the substantial ethnic educational inequalities in Germany. Rather, in a tracked education system, it seems particularly important to ensure that minority students who make it to the higher tracks ultimately succeed there, despite the many challenges they face.

CRediT authorship contribution statement

Claudia Diehl: Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Funding acquisition, Conceptualization. **Katja Pomianowicz:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis. **Thomas Hinz:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.rssm.2025.101085.

References

Adams, J. S. (1965). In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology, 2* pp. 267–299). Academic Press. https://doi.org/10.1016/S0065-2601(08)60108-2.

Arrow, K. J. (1998). What has economics to say about racial discrimination? *Journal of Economic Perspectives, 12*(2), 91–100. https://doi.org/10.1257/jep.12.2.91

Azur, M. J., Stuart, E. A., Frangakis, C., & Leaf, P. J. (2011). Multiple imputation by chained equations: What is it and how does it work? *International Journal of Methods in Psychiatric Research, 20*(1), 40–49. https://doi.org/10.1002/mpr.329

Bach, M., Gawronksi, K., Hoffmann, S., & Mudipappa, M. (2024). Bildung. In statistisches bundesamt (Destatis), wissenschaftszentrum Berlin für sozialforschung (WZB), & bundesinstitut für BevölkerungsforschungBiB (Ed.). *Sozialbericht 2024 Ein Datenreport für Deutschland*, 103–125. Bundeszentrale für politische Bildung.

Bardach, L., Neuendorf, C., Murayama, K., Fahrbach, T., Knigge, M., Nagengast, B., & Trautwein, U. (2023). Does students' awareness of school-track-related stereotypes exacerbate inequalities in education? *Npj Science of Learning, 8*(1). https://doi.org/10.1038/s41539-023-00203-9. Article 1.

Bartlett, J. W., & Hughes, R. A. (2020). Bootstrap inference for multiple imputation under uncongeniality and misspecification. *Statistical Methods in Medical Research, 29* (12), 3533–3546. https://doi.org/10.1177/0962280220932189

Batruch, A., Geven, S., Kessenich, E., & Van De Werfhorst, H. G. (2023). Are tracking recommendations biased? A review of teachers' role in the creation of inequalities in tracking decisions. *Teaching and Teacher Education, 123*, Article 103985. https://doi.org/10.1016/j.tate.2022.103985

Becker, B. (2010). Bildungsaspirationen von migranten. Determinanten und umsetzung in bildungsergebnisse. *Arbeitspapiere Mannheimer Zentrum für Europäische Sozialforschung*, 137.

Becker, B. (2011). Cognitive and language skills of turkish children in Germany: A comparison of the second and third generation and mixed generational groups. *International Migration Review, 45*(2), 426–459. https://doi.org/10.1111/j.1747-7379.2011.00853.x

Becker, B., & Gresch, C. (2016). Bildungsaspirationen in familien mit migrationshintergrund. In *Ethnische Ungleichheiten im Bildungsverlauf* (pp. 73–115). Wiesbaden: Springer VS. https://doi.org/10.1007/978-3-658-04322-3_3.

Becker, B., Gresch, C., & Zimmermann, T. (2022). Are they still aiming high? The development of educational aspirations of lower secondary school students with immigrant backgrounds in Germany. *International Migration Review*. , Article 01979183221112404. https://doi.org/10.1177/01979183221112404

Bellenberg, G. (2012). *Schulformwechsel in deutschland. Durchlässigkeit Und selektion in den 16 schulsystemen der Bundesländer innerhalb der sekundarstufe I*. Bertelsmann Stiftung.

Berti, C., Molinari, L., & Speltini, G. (2010). Classroom justice and psychological engagement: Students' and teachers' representations. *Social Psychology of Education, 13*(4). https://doi.org/10.1007/s11218-010-9128-9. Article 4.

Biewen, M., & Thiele, M. T. (2020). Early tracking, academic vs. Vocational training, and the value of 'second-chance' options. *Labour Economics, 66*, Article 101900. https://doi.org/10.1016/j.labeco.2020.101900

Bittmann, F. (2024). Applied bootstrap analysis with imputed data in stata. *Computer Science and Mathematics*. https://doi.org/10.20944/preprints202401.0813.v1

Blossfeld, P. (2018). Social background and Between-track mobility in the general education system in west Germany and in east Germany after German unification. *Zeitschrift Für Soziologie, 47*(4). https://doi.org/10.1515/zfsoz-2018-0117. Article 4.

Blossfeld, H.-P., & Nester, M. (2024). Differential school trajectories and educational decisions of migrants in Germany—Descriptive results and theoretical explanations. In S. Weinert, H.-G. Rossbach, J. von Maurice, H.-P. Blossfeld, & C. Artelt (Eds.), *Educational processes, decisions, and the development of competencies from early preschool age to adolescence: Findings from the BiKS cohort panel studies* (pp. 305–326). Springer Fachmedien. https://doi.org/10.1007/978-3-658-43414-4_12.

Diehl, C., Hunkler, C., & Kristen, C. (Eds.). (2016). *Ethnische Ungleichheiten im Bildungsverlauf*. Springer Fachmedien. https://doi.org/10.1007/978-3-658-04322-3.

Bonefeld, M., & Dickhäuser, O. (2018). Biased) grading of Students' performance: Students' names, performance level, and implicit attitudes. *Frontiers in Psychology, 9*, 481. https://doi.org/10.3389/fpsyg.2018.00481

Bonefeld, M., Dickhäuser, O., Janke, S., Praetorius, A.-K., & Dresel, M. (2017). Migrationsbedingte Disparitäten in der notenvergabe nach dem Übergang auf das gymnasium. *Zeitschrift Für Entwicklungspsychologie Und Pädagogische Psychologie, 49* (1), 11–23. https://doi.org/10.1026/0049-8637/a000163

Bonizzoni, P., Romito, Marco, & Cavallo, C. (2016). Teachers' guidance, family participation and track choice: The educational disadvantage of immigrant students in Italy. *British Journal of Sociology of Education, 37*(5), 702–720. https://doi.org/10.1080/01425692.2014.982860

Borgna, C., & Contini, D. (2021). Despite the best intentions. Educational inequalities in highly stratified but Choice.Driven tracking system. *Proceedings of the second international conference of the journal "Scuola Democratica" – Reinventing Education VOLUME II learning with new technologies, equality and inclusion*, 545–558.

Breen, R., & Goldthorpe, J. H. (1997). Explaining educational differentials. *Rationality and Society, 9*(3), 275–305. https://doi.org/10.1177/104346397009003002

Buchmann, C., & Park, H. (2009). Stratification and the formation of expectations in highly differentiated educational systems. *Research in Social Stratification and Mobility, 27*(4). https://doi.org/10.1016/j.rssm.2009.10.003. Article 4.

Cattell, R. B. (1973). *Culture fair intelligence tests: CFIT*. Institute for Personality & Ability Testing.

Chen, F., & Cui, Y. (2020). Investigating the relation of perceived teacher unfairness to science achievement by hierarchical linear modeling in 52 countries and economies. *Educational Psychology, 40*(3). https://doi.org/10.1080/01443410.2019.1652248. Article 3.

D'Ambrosio, C., Clark, A. E., & Barazzetta, M. (2018). Unfairness at work: Well-being and quits. *Labour Economics, 51*, 307–316. https://doi.org/10.1016/j.labeco.2018.02.007

Diehl, C., & Granato, N. (2018). Intergenerational inequalities in the education system and the labour market for Native-born children of immigrants from Turkey and the former yugoslavia. In *OECD, catching up? Country studies on intergenerational mobility and children of immigrants* (pp. 71–92). OECD Publishing.

Dockx, J., De Fraine, B., & Vandecandelaere, M. (2019). Does the track matter? A comparison of students' achievement in different tracks. *Journal of Educational Psychology, 111*(5), 827–846. https://doi.org/10.1037/edu0000305

Dollmann, J. (2025). Ethnische diskriminierung im deutschen bildungssystem: ein ausgeprägtes Phänomen und dennoch nicht die Erklärung für ethnische unterschiede im bildungserfolg. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie, 77*(1), 1–26. https://doi.org/10.1007/s11577-025-00991-5

Dollmann, J., & Weißmann, M. (2020). The story after Immigrants' ambitious educational choices: Real improvement or back to square one? *European Sociological Review, 36*(1), 32–47. https://doi.org/10.1093/esr/jcz042

Domina, T., McEachin, A., Hanselman, P., Agarwal, P., Hwang, N., & Lewis, R. W. (2019). Beyond tracking and detracking: the dimensions of organizational differentiation in schools. *Sociology of Education, 92*(3), 293–322. https://doi.org/10.1177/0038040719851879

Dudas, D.-F. (2014). Universitätsbibliothek dortmund. *Die prognostische Validität der nichtverbindlichen Gymnasialempfehlung am Ende der Grundschulzeit*.

Dumont, H., Klinge, D., & Maaz, K. (2019). The many (Subtle) ways parents game the system: Mixed-method evidence on the transition into Secondary-school tracks in Germany. *Sociology of Education, 92*(2), 199–228. https://doi.org/10.1177/0038040719838223

Engzell, P. (2019). Aspiration squeeze: The struggle of children to positively selected immigrants. *Sociology of Education, 92*(1), 83–103. https://doi.org/10.1177/0038040718822573

Esser, H. (2021). »Wie kaum in einem anderen land …«?. *Die Differenzierung der Bildungswege nach Fähigkeiten und Leistungen und ihre Wirkung auf Bildungserfolg, -ungleichheit und -gerechtigkeit. Band 1: Theoretische Grundlagen*. Campus Verlag.

Esser, H., & Seuring, J. (2020). Kognitive homogenisierung, schulische leistungen und soziale bildungsungleichheit: Theoretische modellierung und empirische analyse der effekte einer strikten differenzierung nach den kognitiven Fähigkeiten auf die leistungen in der sekundarstufe und den einfluss der sozialen herkunft in den deutschen Bundesländern mit den daten der „National educational panel Study" (NEPS). *Zeitschrift Für Soziologie, 49*(5–6), 277–301. https://doi.org/10.1515/zfsoz-2020-0025

Georgi, V. B. (2024). Migration & the quest for educational equity in Germany. *Daedalus, 153*(4), 184–205.

Gil-Hernández, C. J., Pañeda-Fernández, I., Salazar, L., & Muñoz, J. C. (2024). Teacher bias in assessments by student ascribed status: A factorial experiment on discrimination in education. *Sociological Science, 11*, 743–776. https://doi.org/10.15195/v11.a27

Gresch, C. (2012). Der Übergang in die sekundarstufe I: leistungsbeurteilung. *Bildungsaspiration und rechtlicher Kontext bei Kindern Mitosz Migrationshintergrund Springer-Verlag*.

Grew, E., Baysu, G., & Turner, R. N. (2024). The association between experiences of unfair treatment in school and adolescent adjustment over 5 years. *Journal of Research on Adolescence, 34*(4), 1545–1561. https://doi.org/10.1111/jora.13023

Hallinan, M. T. (2000). Tracking. From theory to practice. In In. R. Arum, & I. R. Beattle (Eds.), *The strucutre of schooling. reading in the sociology of education* (pp. 218–224). Mayfield Publishing Company.

Heisig, J. P., & Matthewes, S. H. (2022). No evidence that strict educational tracking improves student performance through classroom homogeneity: A critical reanalysis of esser and seuring (2020). *Zeitschrift Für Soziologie, 51*(1), 99–111. https://doi.org/10.1515/zfsoz-2022-0001

Helm, F., Arens, A. K., & Möller, J. (2020). Perceived teacher unfairness and student motivation in math and German: An application of the generalized internal/external frame of reference model. *Learning and Individual Differences, 81*, Article 101891. https://doi.org/10.1016/j.lindif.2020.101891

Henninges, M., Traini, C., & Kleinert, C. (2019). *Tracking and sorting in the German Educational System: Literature review and analyses of the birth cohorts 1970-1980*. ⟨https://dynamicsofinequality.org/publication/tracking-and-sorting-in-the-german-educational-system-literature-review-and-analyses-of-the-birth-cohorts-1970-1980/⟩.

von Hippel, P. T. (2018). HOW_MANY_IMPUTATIONS: Stata module to determine required number of imputations. *Statistical Software Components*. ⟨https://ideas.repec.org//c/boc/bocode/s458452.html⟩.

von Hippel, P. T. (2020). How many imputations do you need? A Two-stage calculation using a quadratic rule. *Sociological Methods Research, 49*(3), 699–718. https://doi.org/10.1177/0049124117747303

Jasso, G., & Resh, N. (2002). Exploring the sense of justice about grades. *European Sociological Review, 18*(3), 333–351. https://doi.org/10.1093/esr/18.3.333

Kao, G., & Tienda, M. (1998). Educational aspirations of minority youth. *American Journal of Education, 106*(3), 349–384. https://doi.org/10.1086/444188

Kempert, S., Edele, A., Rauch, D., Wolf, K. M., Paetsch, J., Darsow, A., Maluch, J., & Stanat, P. (2016). Die rolle der sprache für zuwanderungsbezogene ungleichheiten im bildungserfolg. In In. C. Diehl, C. Hunkler, & C. Kristen (Eds.), *Ethnische Ungleichheiten im Bildungsverlauf* (pp. 157–241). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-04322-3_5.

Krause, A., Rinne, U., & Schüller, S. (2015). Kick it like Özil? decomposing the Native-Migrant education gap. *International Migration Review, 49*(3), 757–789. https://doi.org/10.1111/imre.12107

Kristen, C., & Dollmann, J. (2009). Secondary effects of ethnic origin: Students from turkish families at the transition to secondary education. *Zeitschrift Fur Erziehungswissenschaft, 12*, 205–229.

Legette, K. (2020). A Social-Cognitive perspective of the consequences of curricular tracking on youth outcomes. *Educational Psychology Review, 32*(3). https://doi.org/10.1007/s10648-020-09521-5

Lenzi, M., Vieno, A., Gini, G., Pozzoli, T., Pastore, M., Santinello, M., & Elgar, F. J. (2014). Perceived teacher unfairness, instrumental goals, and bullying behavior in early adolescence. *Journal of Interpersonal Violence, 29*(10), 1834–1849. https://doi.org/10.1177/0886260513511694

Lorenz, G., Gentrup, S., Kristen, C., Stanat, P., & Kogan, I. (2016). Stereotype bei Lehrkräften? eine untersuchung systematisch verzerrter lehrererwartungen. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie, 68*(1), 89–111. https://doi.org/10.1007/s11577-015-0352-3

Lozano-Ruiz, A., Fasfous, A. F., Ibanez-Casas, I., Cruz-Quintana, F., Perez-Garcia, M., & Pérez-Marfil, M. N. (2021). Cultural bias in intelligence assessment using a Culture-Free test in Moroccan children. *Archives of Clinical Neuropsychology, 36*(8), 1502–1510. https://doi.org/10.1093/arclin/acab005

Maaz, K., Baeriswyl, F., & Trautwein, U. (2011). *Leistungsdiagnostik und soziale ungleichheiten in der schule. Eine studie im auftrag der vodafone stiftung deutschland.* Vodafone Stiftung.

Matthewes, S. H. (2021). Better together? Heterogeneous effects of tracking on student achievement. *The Economic Journal, 131*(635), 1269–1307. https://doi.org/10.1093/ej/ueaa106

Mikk, J., Krips, H., Säälik, Ü., & Kalk, K. (2016). Relationships between student perception of Teacher-Student relations and PISA results in mathematics and science. *International Journal of Science and Mathematics Education, 14*(8). https://doi.org/10.1007/s10763-015-9669-7. Article 8.

Molinari, L., Speltini, G., & Passini, S. (2013). Do perceptions of being treated fairly increase students' outcomes? Teacher–student Interactions and classroom justice in Italian adolescents. *Educational Research and Evaluation, 19*(1). https://doi.org/10.1080/13803611.2012.748254. Article 1.

Pomianowicz, K. (2023). Educational achievement disparities between second-generation and non-immigrant students: Do school characteristics account for tracking effects? *European Educational Research Journal, 22*(3), 297–324. https://doi.org/10.1177/14749041211039929

Pomianowicz, K. (2024). Educational expectation gaps between Second-Generation immigrant and ethnic majority students in a comparative perspective: The moderating role of educational tracking. *International Migration Review, 58*(2), 644–679. https://doi.org/10.1177/01979183221149917

Quillian, L. (2006). New approaches to understanding racial prejudice and discrimination. *Annual Review of Sociology, 32*(32, 2006), 299–328. https://doi.org/10.1146/annurev.soc.32.061604.123132

Relikowski, I., Yilmaz, E., & Blossfeld, H.-P. (2012). Wie lassen sich die hohen bildungsaspirationen von migranten erklären? Eine Mixed-Methods-Studie zur rolle von strukturellen aufstiegschancen und individueller Bildungserfahrung. In R. Becker, & H. Solga (Eds.), *Soziologische Bildungsforschung* (pp. 111–136). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-00120-9_5.

Resh, N. (2010). Sense of justice about grades in school: Is it stratified like academic achievement? *Social Psychology of Education, 13*(3). https://doi.org/10.1007/s11218-010-9117-z. Article 3.

Resh, N. (2018). Sense of justice in school and social and institutional trust. *Comparative Sociology, 17*(3–4), 369–385. https://doi.org/10.1163/15691330-12341465

Resh, N., & Dalbert, C. (2007). Gender differences in sense of justice about grades: A comparative study of high school students in Israel and Germany. *Teachers College Record: The Voice of Scholarship in Education, 109*(2). https://doi.org/10.1177/016146810710900206. Article 2.

Resh, N., & Sabbagh, C. (2014). Justice, belonging and trust among Israeli middle school students. *British Educational Research Journal, 40*(6). https://doi.org/10.1002/berj.3129. Article 6.

Resh, N., & Sabbagh, C. (2016). Justice and education. In In. C. Sabbagh, & M. Schmitt (Eds.), *Handbook of social justice theory and research* (pp. 349–367). Springer New York. https://doi.org/10.1007/978-1-4939-3216-0_19.

Riek, K., & van Ophuysen, S. (2014). Kriterien der Übergangsempfehlung – Eine qualitative interviewstudie mit Grundschullehrkräften. In B. Kopp, S. Martschinke, M. Munser-Kiefer, M. Haider, E.-M. Kirschhock, G. Ranger, & G. Renner (Eds.), *Individuelle Förderung und Lernen in der Gemeinschaft* (pp. 270–273). Springer Fachmedien. https://doi.org/10.1007/978-3-658-04479-4_51.

Robbins, J. M., Ford, M. T., & Tetrick, L. E. (2012). Perceived unfairness and employee health: A meta-analytic integration. *Journal of Applied Psychology, 97*(2), 235–272. https://doi.org/10.1037/a0025408

Rosselli, M., & Ardila, A. (2003). The impact of culture and education on non-verbal neuropsychological measurements: A critical review. *Brain and Cognition, 52*(3), 326–333. https://doi.org/10.1016/S0278-2626(03)00170-2

Rotter, C. (2015). Lehrkräfte mit Migrationshintergrund—Zwischen (zugeschriebener) biografie und profession. *In Recht der Jugend und des Bildungswesens, 63*(2), 173–184.

Rubin, D. B. (1987). *Multiple imputation for nonresponse in surveys*. New York: Wiley.

Salikutluk, Z. (2016). Why do immigrant students aim high? explaining the aspiration–Achievement paradox of immigrants in Germany. *European Sociological Review, 32*(5). https://doi.org/10.1093/esr/jcw004. Article 5.

Schaeffer, M. (2019). Social mobility and perceived discrimination: Adding an intergenerational perspective. *European Sociological Review, 35*(1). https://doi.org/10.1093/esr/jcy042. Article 1.

Schaeffer, M., & Kas, J. (2023). The integration paradox: A review and Meta-Analysis of the complex relationship between integration and reports of discrimination. *International Migration Review, Online First*. https://doi.org/10.1177/01979183231170809

Schindler, S. (2017). School tracking, educational mobility and inequality in German secondary education: Developments across cohorts. *European Societies, 19*(1). https://doi.org/10.1080/14616696.2016.1226373. Article 1.

Segeritz, M., Walter, O., & Stanat, P. (2010). Muster des schulischen erfolgs von jugendlichen migranten in deutschland: Evidenz für segmentierte assimilation? *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie, 62*(1), 113–138. https://doi.org/10.1007/s11577-010-0094-1

Small, M. L., & Pager, D. (2020). Sociological perspectives on racial discrimination. *Journal of Economic Perspectives, 34*(2), 49–67. https://doi.org/10.1257/jep.34.2.49

Spörlein, C., & Kristen, C. (2019). Why we should care about regional origins: Educational selectivity among refugees and labor migrants in Western Europe. *Frontiers in Sociology, 4*, 39. https://doi.org/10.3389/fsoc.2019.00039

Sprengholz, M., Diehl, C., Giesecke, J., & Kreyenfeld, M. (2021). From "guest workers" to EU migrants: a gendered view on the labour market integration of different arrival cohorts in Germany. *Journal of Family Research, 33*(2), 252–283.

Sprietsma, M. (2013). Discrimination in grading: Experimental evidence from primary school teachers. *Empirical Economics, 45*(1). https://doi.org/10.1007/s00181-012-0609-x. Article 1.

Statistisches Bundesamt. (2011), *Allgemeinbildende Schulen. Fachserie: 11. Bildung und Kultur*. Statistisches Bundesamt. ⟨https://www.destatis.de/DE/Service/Bibliothek/_publikationen-fachserienliste-11.html#558596⟩.

Statistisches Bundesamt. (2023). *Statistischer Bericht. Allgmeinbildende Schulen*. Schuljahr 2022/2023.

Steinmayr, R., Michels, J., & Weidinger, A. (2017). *Fa (ir) bulous: Faire Beurteilungen des Leistungspotenzials von Schülerinnen und Schülern [Fa (ir) bulous-Fair judgments of students' academic potential]*. Technische Universität Dortmund. *Dortmund: Technische Universität Dortmund*.

Stephany, F. (2019). It deepens like a coastal shelf: Educational mobility and social capital in Germany. *Social Indicators Research, 142*(2), 855–885. https://doi.org/10.1007/s11205-018-1937-9

Thijs, J., & Piscoi, D. (2016). Perceiving discrimination in "Real Life": Distinguishing negative events from discrimination attributions. *Basic and Applied Social Psychology, 38*(3). https://doi.org/10.1080/01973533.2016.1186027. Article 3.

Timmermans, A. C., de Boer, H., Amsing, H. T. A., & van der Werf, M. P. C. (2018). Track recommendation bias: Gender, migration background and SES bias over a 20-year period in the Dutch context. *British Educational Research Journal, 44*(5), 847–874. https://doi.org/10.1002/berj.3470

Traini, C., Kleinert, C., & Bittmann, F. (2021). How does exposure to a different school track influence learning progress? Explaining scissor effects by track in Germany. *Research in Social Stratification and Mobility, 76*, Article 100625. https://doi.org/10.1016/j.rssm.2021.100625

Traini, C., Kleinert, C., & Schindler, S. (2021). Does tracking really affect labour-market outcomes in the long run? Estimating the long-term effects of secondary-school tracking in west Germany. *Longitudinal and Life Course Studies, 12*(3), 389–422. https://doi.org/10.1332/175795920X16062248132253

Van Houtte, M. (2016). Lower-track students' sense of academic futility: Selection or effect? *Journal of Sociology, 52*(4), 874–889. https://doi.org/10.1177/1440783315600802

Van Houtte, M., & Stevens, P. A. J. (2008). Sense of futility: the missing link between track position and Self-Reported school misconduct. *Youth Society, 40*(2), 245–264. https://doi.org/10.1177/0044118X08316251

Van Praag, L., Demanet, J., Stevens, P. A. J., & Van Houtte, M. (2017). Everyone has their own qualities': Tracking and academic self-appraisal in flemish secondary education. *Social Psychology of Education, 20*(3), 601–618. https://doi.org/10.1007/s11218-017-9371-4

Völcker, M., & Hansen-Schaberg, I. (2016). Stigma und hauptschulsozialisation und deren (potentielle) reproduktion am beispiel gegenwärtiger bildungsreformen. *Bildungsforschung, 13*(1). Article 1.

Weiß, R.H. (2006). *CFT 20-R: Grundintelligenztest Skala 2—Revision*. Hogrefe. ⟨https://www.fachportal-hochbegabung.de/intelligenz-tests/cft-20-r-grundintelligenztest-skala-2-revision/⟩.

Wenz, S. E., & Hoenig, K. (2020). Ethnic and social class discrimination in education: Experimental evidence from Germany. *Research in Social Stratification and Mobility, 65*. https://doi.org/10.1016/j.rssm.2019.100461

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data, second edition*. MIT Press.

Zimmermann, T. (2019). Social influence or rational choice? Two models and their contribution to explaining class differentials in student educational aspirations. *European Sociological Review*. https://doi.org/10.1093/esr/jcz054

Zimmermann, T. (2024). Explaining differences in decision-relevant educational knowledge between parents with and without an immigrant background in Germany. *Research in Social Stratification and Mobility, 90*, Article 100894. https://doi.org/10.1016/j.rssm.2024.100894