

Educational integration by the third generation? Placement and academic achievement of students with immigrant background in Germany

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Abstract Studies show that minority students who were born abroad or whose parents were born abroad are less successful in school than their majority peers. However, little is known on whether these disadvantages persist for the grandchildren of immigrants, i.e., the third generation. Assimilation theories come to different predictions for third-generation students' educational integration. We investigate third-generation students' placement in different school types and their reading and mathematics achievements in Germany. Using data on ninth graders ($N=14,958$) collected in the National Educational Panel Study enabled us to precisely identify third-generation students and to distinguish students by their ancestors' countries of birth. Our results reveal that most third-generation students did not differ in their educational success from their majority peers, while first-generation and some groups of second-generation students, on average, were less successful in school. Overall, our findings are in line with classical and new assimilation theories and suggest that educational integration is mostly "completed" by the third generation in Germany. For some groups, however, we do not observe the major trends predicted by classical and new assimilation theories but patterns suggesting processes expected in segmented assimilation theory.

Keywords Third generation · Immigration · Educational inequality · Academic achievement · Acculturation · Diversity

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Bildungsintegration nach drei Generationen? Bildungsbeteiligung und Schulleistungen von Schüler:innen mit Migrationshintergrund in Deutschland

Zusammenfassung Studien zeigen, dass Schüler:innen, die selbst oder deren Eltern im Ausland geboren wurden, in der Schule weniger erfolgreich sind als die Vergleichsgruppe ohne Migrationshintergrund. Wenig erforscht ist, ob Bildungsdisparitäten auch für die Enkelkinder von Eingewanderten, die sogenannte dritte Generation, bestehen. Die Vorhersagen von Assimilationstheorien fallen diesbezüglich unterschiedlich aus. Wir untersuchen die Bildungsbeteiligung von Schüler:innen ($N=14.958$) und ihre Lese- und Mathematikleistungen mit Daten des Nationalen Bildungspanels, die eine präzise Identifikation der dritten Generation und die Unterscheidung verschiedener Herkunftsgruppen ermöglichen. Wir zeigen, dass sich Neuntklässler:innen der dritten Generation in ihrem Bildungserfolg mehrheitlich nicht von der Vergleichsgruppe unterscheiden. Angehörige der ersten Generation und manche zweite Generationsgruppen sind jedoch durchschnittlich weniger erfolgreich als die Vergleichsgruppe. Diese Befunde passen zu der Vorhersage schließlicher Assimilation in der klassischen bzw. neuen Assimilationstheorie und legen nahe, dass die Bildungsintegration in Deutschland spätestens in der dritten Generation „abgeschlossen“ ist. Für manche Herkunftsgruppen beobachten wir jedoch Effektmuster, die nicht mit dieser Vorhersage in Einklang zu bringen sind und vielmehr auf Prozesse hindeuten, die bei segmentierter Assimilation zu erwarten sind.

Schlüsselwörter Dritte Generation · Immigration · Bildungsungleichheit · Akademische Leistung · Akkulturation · Diversität

1 Introduction

In most Western countries, school success varies between majority students and minority students who were born abroad or whose ancestors were born abroad (e.g., Heath and Brinbaum 2014, Chapter 1; Organization for Economic Co-operation and Development [OECD] 2016, Chapter 7). An analysis across OECD countries shows that with few exceptions, students who were born abroad, i.e., first-generation students, perform worse than students who were born and raised in the receiving country but whose parents were born abroad, i.e., second-generation students. Second-generation students, in turn, often perform worse than majority students (OECD 2016). The worse performance of first-generation students is not surprising, given that some of them had been educated within a different education system before migration and/or often needed to learn the new language of instruction upon arrival first (e.g., Dustmann and Theodoropoulos 2010). Much research has been devoted to the second generation's lower levels of school success. The dominant explanation is the on average lower socio-economic position of their parents (e.g., Heath et al. 2008). Given the pivotal role of educational success for life chances, e.g., labor market placement (e.g., Heath et al. 2008; Hout 2012), it is crucial to investigate

whether and how such educational disadvantages are also transmitted to the third generation, i.e., the grandchildren of immigrants.

Assimilation theories offer explanations of how educational disadvantages are transmitted to later generations, however, they come to different predictions. The classical assimilation theory (e.g., Gordon 1964) and also the new assimilation theory (e.g., Alba and Nee 2003) conceptualize integration as an irreversible process, and we would expect the gap in educational success between minority and majority students to narrow or disappear for third-generation minority students. Among others, Portes and Zhou (1993) challenge this reasoning in their theory of segmented assimilation and argue that integration does not uniformly develop in an always progressing manner for all groups. For example, some immigrants may assimilate into the underclass, which is characterized by few options for upward mobility resulting in permanent marginalization and, thus, gaps in educational success may persist even in the third generation. Hence, although the reasonableness of the “third-generation” construct for everyday life and in the public discourse may be questionable (see Fachkommission Integrationsfähigkeit 2021), looking at the third generation would help to clarify whether the observed worse performance of the second generation is generated by different speeds of continuing (classical) assimilation or hints at processes of segmented assimilation. However, very little research has addressed the third generation’s educational success, particularly in the German context (e.g., Maciejewski et al. 2022), and the few findings are mixed. Potential explanations for these inconclusive findings are the use of different definitions of the third generation and that only some studies differentiated between origin groups.

In this paper, we addressed these issues and examined whether gaps in educational success persist between majority and third-generation students in Germany. After reviewing assimilation theories and deriving additional predictions relating to students’ socio-economic background, we analyzed students’ educational success as indicated by their school type placement and academic achievement in German and mathematics. We also distinguished between different origin groups and explored different operationalizations of the third generation. Using data from the National Educational Panel Study (NEPS) from a sample of ninth graders in Germany, we observe that first-generation and some groups of second-generation students, on average, were educationally less successful than majority students. In contrast, most groups of third-generation students show similar levels of educational success than majority students. Overall, our findings are in line with classical and new assimilation theories and suggest that educational integration is mostly “completed” by the third generation in Germany. For some groups, however, we do not observe the major trends predicted by classical and new assimilation theories but patterns suggesting processes expected in segmented assimilation theory.

2 Assimilation theories: What to expect for the third generation?

We understand integration as “the processes that increase the opportunities of immigrants and their descendants to obtain the valued ‘stuff’ of a society, as well as social acceptance, through participation in major institutions such as the educational and

political system and the labor and housing markets” (Alba and Foner 2015, p. 5). Underlying is a process of mutual adaption, i.e., not a one-sided adaption of immigrants to the majority¹. Yet, the receiving country’s schools, the education system, and the value of educational credentials only change gradually. Thus, we conceive of “completed” educational integration when minority and majority groups do not differ in their educational success, on average. In the following, we review the major strands of assimilation theory, i.e., classical/new assimilation theory and accounts of segmented assimilation, to explain why educational integration may progress differently across generations and origin groups. Moreover, we derive additional arguments relating to social background effects in the following.

2.1 Classical and new assimilation theory

Classical assimilation theory (e.g., Gordon 1964) conceptualizes integration as a non-reversible process progressing over time spent in the receiving country, which may take several generations to fully unfold. In a nutshell, integration, which considerably overlaps with the concept of “assimilation” in the US literature (Alba and Foner 2015, p. 8), likely starts with the adoption of the language spoken in the receiving country and with the adoption of some behavioral patterns (e.g., eating habits). Educational integration is a matter of social mobility. Even though integration is assumed to be non-reversible, barriers, like discrimination, can impede further integration indefinitely (e.g., Gordon 1964, p. 78).

New assimilation theory (Alba and Nee 2003) proposes a more comprehensive argument entailing several mechanisms, which highlight the relevance of institutional processes, networks, differences in capital endowments, and the relevance of segregation and discrimination. Moreover, scholars highlight purposive action assuming that immigrants and their descendants act according to mental models, which are shaped by context-bound perceptions of what fosters their self-interest (Alba and Nee 2003, p. 37). Even though assimilation is not seen as the only and inevitable outcome, it is still seen as the major trend to be expected (see also Esser 2008).

According to these assimilation theories, one reasoning for the ever-progressing integration of immigrants and their descendants is that they accumulate receiving society-specific resources over time spent in the receiving country and across generations (e.g., Becker 2011; Kalter 2006). These resources include skills in the language of the receiving country or knowledge of the respective education system. Proficiency in the language of the receiving country, especially if it is the language of instruction, helps to understand the tasks and instructions in class and may thus promote educational success (Prevoe et al. 2016). Particularly relevant for the complex German school system is the knowledge of the education system that may also help to successfully pass school, e.g., by informing decisions about educational transitions (e.g., Olczyk and Will 2019). While first-generation immigrants typically have to accumulate these resources, their descendants (i.e., the second generation) will benefit from their parents’ knowledge. For example, parents are typically involved

¹ We use the term “majority” to describe persons with no migration event in their family in the preceding two generations, i.e., persons of the fourth generation or higher.

in the educational decisions of their children and can transmit their knowledge to their children. The third generation may benefit even more because more receiving country-specific resources have been accumulated in their families, e.g., their parents experienced all phases of education in the receiving country.

Moreover, as the accumulation of receiving country-specific resources progresses, social mobility should decrease socio-economic differences between minority and majority members across generations (e.g., Heath et al. 2008). This is in line with core arguments of classical and new assimilation theories. It is also relevant for the educational integration of immigrants' descendants, as educational success also depends on social background, i.e., on parents' socio-economic position and education, especially in Germany (e.g., Diehl et al. 2016). Accordingly, socio-economic differences between majority members and the second generation should be smaller than between majority members and the first generation. Consequently, these differences should be less relevant for explaining potential educational gaps between majority and third-generation students.

Especially the social mobility argument rests on the assumption that immigrants and their descendants can acquire receiving country-specific resources, e.g., there are no barriers like discrimination. Yet, classical assimilation theory acknowledges that persistent discrimination can impede integration (Gordon 1964, p. 78), and new assimilation theory proposes several mechanisms that may hinder integration (Alba and Nee 2003, Chapter 2). Still, the major trend should be educational integration as minority students will accumulate at least some receiving country-specific resources, e.g., language skills, by their mere presence in the compulsory German school system. Overall, the argument is that barriers are likely to affect only single minority groups.

In sum, classical and new assimilation theories assume integration to progress. Hence, compared to the second or first generation, third-generation students should differ less or not at all from their majority peers in their educational success. Moreover, socio-economic differences should attenuate over generations. Social background differences should thus contribute less to the explanation of gaps in educational success between majority and third-generation students than between majority and first- or second-generation students. This should apply to most origin groups, although barriers, such as discrimination, may slow down the process for single groups.

2.2 Segmented assimilation, oppositional culture, and ethnic reactivity

The theory of segmented assimilation (Portes and Zhou 1993) challenges this reasoning and argues that integration does not develop uniformly and in an always progressing manner for all immigrants. Developed in the context of post-1965 migration to the US, the first argument relevant to our application is that (current) societies are not primarily made up of a relatively uniform mainstream anymore. Instead, distinct sectors with very different options for social mobility exist. Consequently, Portes and Zhou (1993) propose three different paths of adaption: (1) integration into a shrunken middle class with options for upward mobility, as assumed in 'classical assimilation,' (2) assimilation into the underclass, characterized by minimally paid

menial jobs with few options for upward mobility resulting in permanent marginalization, and (3) rapid advancement, often exemplified by the school success of second-generation Asian students in the US (e.g., Kroneberg 2008), with deliberate preservation of immigrant community's values and tight solidarity.

According to Portes and Zhou (1993), the path of adaptation depends not only on the characteristics that immigrants bring along but also on the social context in the receiving society. They describe the social context as “modes of incorporation (...) formed by the policies of the receiving government; the values and prejudices of the receiving society; and the characteristics of the co-ethnic community” (Portes and Zhou 1993, p. 83).

The second argument relevant to our application relates to the characteristics of the co-ethnic community. A co-ethnic community can foster the educational success of immigrant descendants by providing “moral and material resources well beyond those available through official assistance programs.” (Portes and Zhou 1993, p. 86). Kroneberg (2008) distinguishes two mechanisms. First, via contents of origin country culture, “which entail values and beliefs that are particularly conducive to school performance” (Kroneberg 2008, p. 141). Second, via co-ethnics reinforcing parents' normative expectations and supplying resources, e.g., private ethnic schools, to achieve these. This is the reasoning used to explain the rapid advancement in school success of second-generation students in the US, even beyond the average performance of their majority peers (Kroneberg 2008). Even though segmented assimilation theory was mainly developed to explain different paths of adaptation of second-generation immigrants in the US, the arguments can also be applied to other contexts and generations. In Germany, for instance, parents and students of Turkish descent also report high educational aspirations and expectations (Becker et al. 2022; Gresch et al. 2012; Salikutluk 2016) that could promote students' school success.

While the often-observed concentration of immigrant households in cities and in typically more affordable neighborhoods may provide opportunities for co-ethnic networks to foster educational integration, the concentration of minority members can also have adverse effects. The proximity to marginalized persons can expose immigrants and their descendants to “adversarial sub-cultures developed by marginalized native youths to cope with their own difficult situation.” (Portes and Zhou 1993, p. 83). This argument is similar to the reasoning on the development of oppositional collective identities and oppositional cultural frames that may create a dissonance between school learning and students' cultural identity (Fordham and Ogbu 1986) or may lead to their belief that school does not matter (Ogbu 2004).

A related argument also predicting adverse effects for educational integration is that of reactive ethnicity by Portes and Rumbaut (2014, Chapter 2) which starts from the same argument of segmented societies. When immigrants over time spent in the receiving country or across generations realize that barriers are keeping them from accessing the “good segments” this may lead to ethnic solidarity and reactive processes to experiences of discrimination and rejection from the mainstream society.

Overall, accounts of assimilation that start from a segmented conceptualization of societies come to different predictions compared to classical or new assimilation theories. Segmented assimilation theory suggests that some origin groups might have been set on a trajectory of permanent marginalization while other groups

assimilated. According to this reasoning, the gap in educational success should persist between majority students and those third-generation students whose families were set on a trajectory of marginalization. For these groups, socio-economic gaps between majority and minority members should remain and should account for achievement gaps between majority and third-generation students. However, under specific conditions, resources available from co-ethnic networks can explain why some groups may exhibit higher educational achievements than their majority peers.

3 Third-generation students in German schools

Germany has an immigration history that allows to investigate the third generation in secondary school. Before delving into the few studies on the educational success of the third generation in Germany, we briefly describe the relevant immigration history to Germany and the non-trivial question of how to define the population of interest.

3.1 Immigration to Germany: Whose grandchildren do we observe?

Germany's recent immigration history is characterized by three waves relevant to the current population of the third generation living in the country today. The first wave is composed of ethnic Germans who were displaced during and especially after World War II. Approximately 12 million people moved between 1945 and 1949 due to Germany's shifting borders (Schimany and Baykara-Krumme 2012). They are not considered immigrants in population statistics and are not the "typical" immigrant, e.g., they usually did not have to learn a new language or adjust to new institutions—at least not more than non-immigrant persons in post-war Germany. However, due to the displacement, they lost a substantial amount of resources, e.g., their jobs and networks. Being "foreign-born" with regard to today's borders makes it difficult to distinguish them from non-ethnic German immigrants.

Second, between 1955 and 1973, labor immigrants from Turkey, Spain, Italy, former Yugoslavia, and Greece came to Germany to fill shortages in less qualified sectors of the Western German labor market. After the recruitment stop in 1973, immigration continued on a smaller scale for family reunification and in form of marriage migration. Corresponding to the aim of filling shortages in the less qualified sectors, these recruitment programs mostly attracted immigrants with lower levels of education. Mostly due to slow social mobility their descendants still show less educational success than their majority peers (Olczyk et al. 2016a, p. 62).

Third, the inflow of ethnic Germans continued and increased considerably after 1990 when immigration from Eastern European states and the former Soviet Union states increased. This group usually got German citizenship very fast and had on average better formal education than the labor immigrants (Kogan 2011). However, compared to displaced ethnic Germans who migrated directly after WWII, they often had fewer receiving country-specific resources upon arrival, such as lower levels of German language proficiency and less knowledge of the German education system (Kogan 2011).

All of these minority members may experience discrimination in Germany. However, studies show that particularly persons of Turkish descent are negatively stereotyped (e.g., Froehlich et al. 2016), although newer studies reveal that immigrants with a more recent immigration history, e.g., Afghani or Syrian immigrants, are more negatively stereotyped than the labor immigrants who arrived between 1955 and 1973 and their descendants (Froehlich and Schulte 2019). Other research shows that persons of Turkish descent are more often perceived as foreigners (Asbrock et al. 2014), and that persons of Turkish or Arabic descent often feel more discriminated against (e.g., Tucci et al. 2014) than other origin groups under study, such as immigrants from Eastern European countries. At the same time, findings from a prior study do not indicate that students of Turkish descent endorse detrimental oppositional cultures (Lorenz et al. 2021a); we are not aware of similar studies on oppositional cultures of other origin groups in Germany.

3.2 How to define the third generation?

Defining third-generation students may seem trivial, they are the grandchildren of immigrants. However, in most cases, not all four grandparents have been born abroad. Studies differ in how they define the third generation: For instance, some studies exclude students with only one out of four grandparents born abroad, while other studies also include students who are typically classified as second generation (see Fig. 1). Figure 1 depicts a detailed generation classification using the numbering scheme proposed by Olczyk et al. (2014, 2016b). Note that the digits are arbitrarily set. For our purposes, we think of them as an ordinal measure of the potential availability of receiving country-specific resources in the target students' families. For example, a third-generation student with one grandparent born abroad will, on

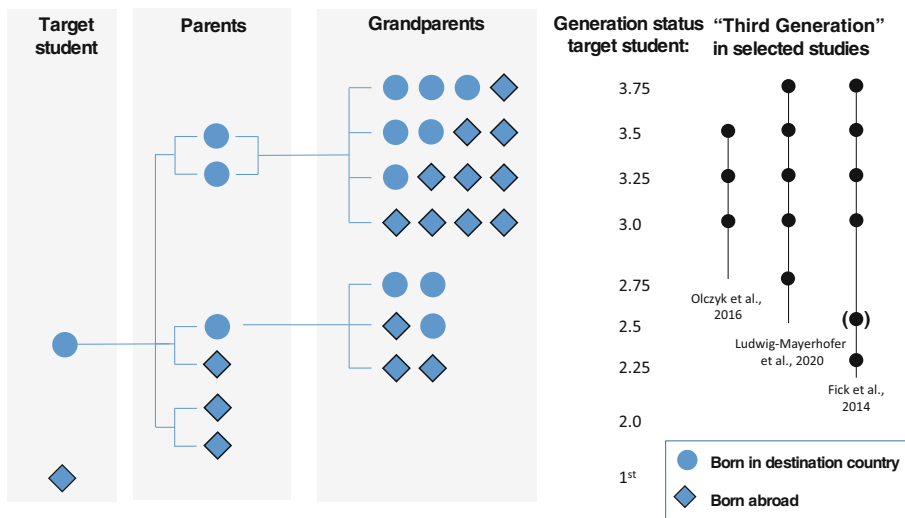


Fig. 1 Detailed Immigration Generation Status Scheme adapted from Maciejewski et al. (2022), Olczyk et al. (2014, 2016b) and Definition of the Third Generation in Selected German Studies

average, have more receiving country-specific resources in the family than a third-generation student with three grandparents born abroad.

3.3 Third-generation students in German schools: What do we know?

To our knowledge, previous findings on the third generation's school success from German-wide data are scarce and mixed. Hunkler (2014) used census data to analyze the educational attainment of 26- to 30-year-olds. The data only allowed to identify the subset of third-generation descendants of labor immigrants who resided with their parents. They showed a significantly lower rate of holding a higher secondary degree ("Fach-/Abitur") compared to the majority population, defined as those for whom no migration event could be deduced from the data, and compared to the second generation. In contrast, second- and third-generation descendants from Western industrial countries, who were lumped together in one category due to small group sizes, showed higher rates of completing a higher secondary degree. Olczyk et al. (2016a) analyzed ninth graders using the same NEPS data as we will use in the present study but restricted their analysis to third-generation students with two or more grandparents born abroad. This drastically reduced the number of cases available. They found third-generation FSU students to outperform their majority peers in educational attainment. Students with Turkish ancestry were found less often in academic tracks, compared to majority and second-generation students. Similar patterns were observed for proficiency levels in German. Although the findings from both studies appear to be similar for students of Turkish descent, the limitations of the data used in the first study and the small subset of students selected in the second study² do not warrant conclusions about the process of educational integration. Ludwig-Mayerhofer et al. (2020) analyzed the influence of socio-economic and socio-cultural background on school achievement in reading and mathematics using the 5th grader cohort of the NEPS. Net of family composition, social background, and other predictors, they found no differences in mathematics and reading achievement between third-generation and majority students, thus contradicting previous findings (Hunkler 2014; Olczyk et al. 2016a). Unlike Hunkler (2014) and Olczyk et al. (2016a), Ludwig-Mayerhofer et al. (2020) did not distinguish origin groups. Hence, the positive and negative differences observed in the other studies may, on average, have canceled each other out. Moreover, Ludwig-Mayerhofer et al. (2020) also counted some students with only one parent born abroad to the third generation (see Fig. 1), arguing that they hardly differ in characteristics and outcomes.

Findings from regional and local studies do somewhat differ. Fick et al. (2014) used a large general population sample collected in a South-Western state of Germany, where especially labor immigrants settled. With their broad definition of the third generation (see Fig. 1), they found third-generation students with Turkish ancestry to have less often obtained a higher secondary degree than the majority population. For the third-generation descendants of immigrants from former Yugoslavia, they document significantly higher rates of having obtained a higher school degree

² The third generation definition used resulted in only 9 observations of third-generation students with FSU ancestry and 19 with Turkish ancestry.

than the majority population. Italian third-generation students were found to obtain a higher school degree less often than the majority population. A study on third graders in the local setting of Cologne found no significant differences in spelling and mathematics achievement for third-generation students with Turkish ancestry compared to majority peers. However, their reading scores were significantly lower (Dollmann 2010, p. 35). The multiple analyses showed that social background differences predominantly accounted for the difference in reading scores between third-generation students and their majority peers. Finally, another local study on German and Turkish-origin kindergarteners in South-West Germany shows very similar results on cognitive skills and German vocabulary (Becker 2011). The study documents significantly lower scores on both outcomes when comparing third-generation kindergarteners to their majority peers; the analyses showed that differences in cognitive skills are again predicted by differences in social background characteristics. Differences in German vocabulary scores decreased when receiving country-specific resources, e.g., parents' language skills in German, and ethnic resources, such as Turkish language skills, were controlled for.

Overall, the results are mixed with a tendency of third-generation Turkish ancestry students showing lower levels of school success than their ethnic majority peers while FSU ancestry students show more success in some studies. The ambiguous findings potentially result from the different definitions of the third generation used in the studies and from whether or not studies differentiated between origin groups. Moreover, the studies used different samples (general population, students in different grades, Germany-wide vs. regional or local), which may also contribute to the mixed results.

4 The present study

Our study investigates whether educational gaps persist between majority and third-generation students in Germany. Informed by classical and new assimilation theories, our first set of expectations is that the gap in educational success between majority and minority members narrows across generations and is smallest or even non-existent between majority and third-generation students. We further expect social background gaps to attenuate across generations so their impact on majority-minority group differences in educational success should decrease across generations.

In contrast, our second set of expectations, informed by the theories of segmented assimilation, oppositional culture, and reactive ethnicity, argues that this pattern does not uniformly apply to all groups. Accordingly, despite high educational aspirations, educational gaps between majority and third-generation students can persist for members of particularly marginalized groups, such as descendants from former labor immigrants or minorities who particularly experience discrimination (e.g., students of Turkish descent). This set of expectations also entails that social background gaps and their impact on educational achievement gaps persist across generations for these marginalized groups.

We examine these questions by distinguishing several origin groups and by using different operationalizations of the third generation. This enables us to investigate

whether the patterns of third-generation students' educational success are robust across the origin groups under investigation and across different definitions of the third generation.

5 Methods

5.1 Participants and procedure

We used data from the first wave of starting cohort 4 of the National Educational Panel Study (Blossfeld and Roßbach 2019; NEPS Network 2021)³ to investigate the educational success of third-generation students in Germany. Students were sampled all over Germany using a multistage sampling strategy (Aßmann et al. 2011); participation was voluntary. In 2010/11 the initial panel sample comprised 16,425 ninth graders. Of these, we kept 14,958 students (49.9% female, $M_{age} = 15.10$, $SD_{age} = 0.63$) who attended a regular school ($N_{school} = 545$, $N_{class} = 1012$) and provided information on their own, their parents' and their grandparents' countries of birth for our analysis.

5.2 Measures

We used students' achievement test scores as well as questionnaire data from students and their parents in our analyses. We also included the sampling information on school type and students' gender and age provided by school records.

5.2.1 Educational success

Students' *school type placement* and their *academic achievement* served as indicators of their educational success. Our *first* measure is the attended school type. In Germany, students are assigned to an academic track leading to a university entrance degree or to non-academic tracks leading to vocational education after completing primary education. We distinguished whether students attended an *academic track* (1) or a non-academic track (0).

Our *second* dependent measure is the score on a *reading comprehension test* in German (Gehrer et al. 2013). The test is based on the concept of literacy (OECD 1999) and consists of five texts that cover a range of different text functions. Applying IRT-scaling with a partial credit model to the 31 test items resulted in weighted maximum likelihood estimates (WLEs) with a WLE-reliability of 0.75 for the whole sample (Haberkorn et al. 2012). The WLE has a mean of zero for the whole sample of test-takers. Test scores close to zero indicate average proficiency, whereas higher values represent above-average proficiency levels.

Third, students' scores on a *mathematics achievement test* (Neumann et al. 2013) served as another indicator of academic achievement. The test captures aspects

³ The NEPS is carried out by the Leibniz Institute for Educational Trajectories (LIfBi, Germany) in cooperation with a nationwide network.

of literacy and is also based on the curriculum. It comprises the content areas “quantity,” “space and shape,” “change and relationships,” and “data and chance.” Applying a partial credit scaling model to the 22 items resulted in WLEs with a WLE-reliability of 0.79 for the whole sample of test-takers (Duchhardt and Gerdes 2013).

5.2.2 Immigrant background

We used students’ answers on their own, their parents’ and their grandparents’ countries of birth to determine their immigrant background. Specifically, we included information on students’ *generation status* based on the approach by Olczyk et al. (2014, 2016b). That is, we distinguished majority students, i.e., those who were born in Germany and whose parents and grandparents were all born in Germany, from first-, second-, and third-generation students. The first generation comprised students who were foreign-born, irrespective of their age at immigration and irrespective of their parents’ and grandparents’ countries of birth.⁴ Moreover, we distinguished second-generation students (“2.0”-generation, for details on the numbering scheme see Fig. 1), i.e., students who were born in Germany but whose parents were both foreign-born, from German-born students with only one parent born abroad (“2.25–2.75”-generation). Third-generation students comprised students who were born in Germany, whose parents were both born in Germany, but who have at least one foreign-born grandparent. As previous research used different operationalizations (see Sect. 3.2), we further differentiated between two groups of third-generation students to check whether the findings vary. We distinguished third-generation students who have at least two foreign-born grandparents (“3.0–3.5”-generation) from students with only one foreign-born grandparent as a separate group (“3.75”-generation).

In addition, we differentiated several *origin groups*. We used students’ information on their own, their parents’ or their grandparents’ countries of birth to identify the two largest groups in Germany, i.e., immigrants from Turkey ($N=844$, 5.6%) and the Former Soviet Union (FSU; $N=814$, 5.4%). Due to the small number of observations within each generation group, students with ancestries from other countries were grouped according to Germany’s immigration history (see Sect. 3.1). We distinguished students whose families immigrated from Middle and Eastern European countries ($N=1263$, 8.4%), from Southern European countries ($N=902$, 6.0%), as well as from other areas, such as Africa or Asia (“Rest of world,” $N=1723$, 11.5%).

5.2.3 Social background and other covariates

We operationalized students’ *social background* using three measures: (1) the parents’ highest occupational status as an indicator of the family’s socio-economic status (SES), (2) the parents’ highest educational level, and (3) the family’s number of books at home as two indicators of the family’s sociocultural resources. While

⁴ We also grouped foreign-born adolescents with German-born parents as first-generation immigrants as this group was small (cf. Olczyk et al. 2014).

parents' occupational status and educational level can be considered as more distal structural characteristics of students' social background, the number of books is assumed to be more proximally related to processes within the family (Heppt et al. 2022). Although these social background indicators do overlap (e.g., educational level is likely to influence occupational position), previous findings suggest that they independently contribute to educational outcomes and should not be used interchangeably (Budoki and Goldthorpe 2013; Heppt et al. 2022). We used parents' highest *International Socio-Economic Index of Occupational Status* (ISEI; Ganzeboom 2010) as an indicator of the family's SES. The highest ISEI ranges from 10 to 90 and higher values indicate a higher SES. We used the information given in the parental interview (55.2% of observations) and complemented missing data with students' answers. We also included the highest degree of *parental education* and distinguished parents with no or low-level degrees (not exceeding 9 years of schooling) from parents with degrees at an intermediate level (about 10 years of schooling) and from parents with high-level degrees (at least 12 years of schooling). Again, we used parents' answers (52.8%) and complemented missing information with students' proxy reports. Note that for SES and parental education, the share of missing information in parental interviews varies considerably across generations and origin groups, ranging from 35% to almost 100%, with more missing values for first-generation respondents. In addition, students estimated the *number of books* at home, ranging from 1 (*none or only very few [0 to 10 books]*) to 6 (*enough to fill a shelf unit [more than 500 books]*). We recoded this information resulting in two categories, i.e., 0 (*up to 100 books*) and 1 (*more than 100 books*). In the multiple analyses, we also controlled for students' *age* and *gender* (for descriptive statistics see Table 1 and Table S.1 in the supplementary information).

5.3 Data analysis

We conducted a series of multiple regression analyses to investigate the educational success of third-generation students. Specifically, we used linear probability models to predict the attended school type and OLS-regressions to predict our indicators of academic achievement, i.e., the WLEs in reading and mathematics. We ran two sets of analyses. First, we only included students' generation status and their families' origin countries. Second, we added social background characteristics as well as gender and age. When predicting the WLEs in reading and mathematics, we controlled for the attended school type. We z-standardized all continuous variables, i.e., reading comprehension and mathematics achievement scores, HISEI, and age (see Table S.2 in the supplementary information for pairwise correlations between the variables). Hence, the OLS-coefficients are standardized for continuous outcomes and predictors and semi-standardized for continuous outcomes and categorical predictors. The coefficients from linear probability models are given as average marginal effects that show the average change in probability when the independent variable is increased by one unit.

We use design weights and model the cluster membership of the students in our regression analyses (see Steinhauer and Zinn 2016, p. 14). Some of our variables had missing values (see Table S.1 in the supplementary information). For the re-

Table 1 Descriptive Statistics for the Indicators of Educational Success and Social Background in the Analysis Sample

	<i>n</i>	Academic track		Reading achievement		Mathematics achievement		SES		Parental education: high-level degree		Number of books at home (> 100)	
		%	Mean	Mean	Mean	Mean	Mean	%	Mean	%			
Generation status × region of origin													
Majority	9412	37.79	0.11	0.16	52.58	42.23	60.48						
1st Generation													
Turkey	92	9.78	-1.26	-0.83	29.74	13.64	15.73						
FSU	358	14.53	-0.63	-0.52	39.53	41.26	25.58						
Middle & Eastern Europe	98	13.27	-0.70	-0.41	40.41	48.44	27.84						
Southern Europe	134	8.96	-0.98	-0.77	35.53	30.77	24.59						
Rest of world	262	30.53	-0.50	-0.43	50.02	50.52	41.83						
Total	944	17.58	-0.71	-0.55	41.04	40.22	29.24						
2nd Generation													
Turkey	521	18.04	-0.97	-0.69	33.72	15.37	27.04						
FSU	283	21.55	-0.37	-0.28	38.68	39.78	40.96						
Middle & Eastern Europe	192	33.85	-0.10	-0.04	43.15	54.35	46.77						
Southern Europe	249	16.06	-0.74	-0.56	38.10	37.93	24.17						
Rest of world	357	31.93	-0.48	-0.36	42.10	44.15	30.77						
Total	1602	23.35	-0.61	-0.45	38.45	33.85	32.25						
One parent born abroad													
Turkey	196	18.88	-0.87	-0.76	42.11	22.54	27.23						
FSU	69	39.13	0.03	-0.01	46.47	53.57	52.17						
Middle & Eastern Europe	203	33.99	0.03	0.02	51.01	38.71	52.79						
Southern Europe	275	28.73	-0.20	-0.23	46.68	29.88	45.11						
Rest of world	595	41.68	0.08	0.04	53.85	52.83	61.09						
Total	1338	34.38	-0.12	-0.14	49.99	41.63	51.18						

Table 1 (Continued)

	<i>n</i>	Academic track	Reading achievement	Mathematics achievement	SES	Parental education: high-level degree	Number of books at home (> 100)
		%	<i>Mean</i>	<i>Mean</i>	<i>Mean</i>	%	%
3rd Generation							
<i>Overall (1–4 foreign-born GP)</i>							
Turkey	35	17.14	-0.67	-0.52	45.49	31.03	48.48
FSU	104	36.54	0.16	0.15	54.26	54.95	67.65
Middle & Eastern Europe	770	44.55	0.34	0.20	54.25	46.80	62.37
Southern Europe	244	34.84	0.10	-0.13	51.90	40.79	65.42
Rest of world	509	39.49	0.18	0.15	52.93	43.34	61.51
Total	1662	40.49	0.22	0.12	53.34	45.05	62.60
<i>Subgroup (2–4 foreign-born GP)</i>							
Turkey	22	9.09	-0.75	-0.86	41.83	21.05	30.00
FSU	10	50.00	-0.01	-0.29	47.20	55.56	44.44
Middle & Eastern Europe	145	40.69	0.10	0.09	53.84	45.39	59.72
Southern Europe	53	33.96	-0.13	-0.26	52.95	40.82	70.00
Rest of world	234	34.62	0.10	-0.09	50.51	38.14	55.41
Total	464	35.56	0.03	-0.09	51.44	40.42	57.05
<i>Subgroup (1 foreign-born GP)</i>							
Turkey	13	30.77	-0.50	0.00	51.15	50.00	76.92
FSU	94	35.11	0.18	0.19	54.95	54.88	69.89
Middle & Eastern Europe	625	45.44	0.40	0.22	54.34	47.14	62.99
Southern Europe	191	35.08	0.17	-0.10	51.63	40.78	64.21
Rest of world	275	43.64	0.24	0.35	54.98	47.67	66.67
Total	1198	42.40	0.30	0.20	54.06	46.84	64.73

Note. *N* = 14,958. Statistics are based on unstandardized data before imputation
 SES Socio-economic status, FSU Former Soviet Union, GP Grandparents

gression analyses, we used multiple imputation using chained equations to generate 20 datasets with complete information.

6 Results

We begin by describing our analysis sample. Subsequently, we compare the educational success of majority and different groups of minority students according to their generation status and origin group. Finally, we further differentiate the group of third-generation students regarding the number of grandparents born abroad.

6.1 Third-generation students enrolled in German schools

Corresponding to the major waves of immigration to Germany, we observe a substantial number of third-generation students whose families migrated from Turkey and Southern Europe (Table 1). These students are most likely descendants of labor immigrants. A large number of third-generation students in our analysis sample have ancestors who migrated from the FSU and Eastern European countries to Germany. However, we could not determine if they are descendants of ethnic Germans or other nationals. Finally, there is a non-negligible number of third-generation students whose grandparents migrated from other countries. Overall, regarding the number of grandparents born abroad, most of the third-generation students in our analysis sample have only one foreign-born grandparent.

Table 1 also shows the indicators for educational success and social background. Overall, third-generation students attend academic tracks about as often as majority students ($t=2.15$, $p=0.317$)⁵ and show similar mathematics achievement scores ($t=-1.31$, $p=1.000$). In reading achievement, third-generation students even slightly outperformed their majority peers ($t=3.23$, $p=0.012$, $\eta^2=0.001$, 95% CI [0.0001, 0.002], $d=0.06$). However, this difference is smaller than an empirical benchmark for normative expectations for ninth graders' annual academic growth in Germany, which ranges between a (mean) effect size of 0.13 for the transition from grade 8 to 9 and a (mean) effect size of 0.09 for the transition from grade 9 to 10 for German reading (Brunner et al. 2023). Regarding third-generation students' social background, we observed that, overall, their parents' SES ($t=1.36$, $p=1.000$) is similar to majority parents' SES. Their parents also have a higher educational degree ($t=2.08$, $p=0.377$) about as often as majority parents.

Moreover, Table 1 shows that there is some stability in the selection of immigrants to Germany over time as indicated by the relatively stable distribution of social background characteristics. That is, the distribution of social background characteristics of *current* first-, and second-generation students, whose parents are born abroad, is similar to the documented social background distributions of the former first generation, i.e., the grandparents of the current third generation (see Sect. 3.3 above). For example, the Turkey-born parents of current first- and second-generation students

⁵ We performed one-way ANOVA and Bonferroni-adjusted post-hoc analyses to investigate differences between generation groups.

are on the lower end of the SES and educational degree distributions, whereas FSU-born parents of current first- and second-generation students are on par regarding their highest educational degree and more similar to majority students' parents in terms of their SES.

6.2 Educational success across three generations

A direct analysis of intergenerational educational integration across three generations would not only require data on currently enrolled third-generation students, but also information on their parents' and grandparents' integration. While the data at hand provide some information on parents (e.g., on their educational level), they do not include information on grandparents except for their country of birth. Given the relatively stable distribution of social background over time (see Sect. 6.1), we can, however, get some indication of how intergenerational integration progresses in Germany, by comparing currently enrolled first- and second-generation students to their third-generation peers. Still, the findings in this section should be interpreted with caution. Even though immigration patterns appear stable, the results may suffer from unobserved heterogeneity, e.g., differences in motives for upward social mobility between current first-generation immigrants and the grandparents of third-generation students.

Table 2 shows the results for the indicators of educational success across generations and origin groups as predicted by a series of regressions (see Fig. 2 in the Appendix for a graphical representation of the central findings). Due to small group sizes, we did not distinguish between one grandparent born abroad vs. two or more grandparents born abroad for Turkish- and FSU-origin third-generation students. First, we predicted students' attendance of an academic track and their reading and mathematics achievements by their generation status and their families' origin countries (Table 2, Models 1, 3, and 5). Overall, the results show that the differences in educational success decrease in most groups and on all three indicators across generations, except for Turkish-origin students. Almost all groups of first-generation students attend an academic track less often (except for the group "Rest of world") and score significantly lower on both tests than majority students. The findings for second-generation students are more diverse. Compared to their majority peers, students of Middle and Eastern European descent show similar levels of educational success, while those with ancestors from Turkey, the FSU, or Southern European countries show lower levels. Second-generation students from the "Rest of world" group attend academic tracks as often as majority students but score lower on both tests. Students with only one foreign-born parent show similar levels of educational success compared to their majority peers, except for students of Turkish and Southern European descent who fare worse than majority students, on average.

Most third-generation students show similar levels of success in school compared to their majority peers. However, there are a few exceptions. Students of Turkish descent attend academic tracks less often than their majority peers, i.e., the predicted probability is 18 percentage points lower. They also score lower in the reading and mathematics tests. However, given that the group of third-generation students of Turkish descent encompasses only 35 individuals, this finding should be interpreted

Table 2 Linear Probability Models (Academic Track) and OLS-Regressions (Achievement Scores) Predicting Educational Success by Generation Status and Origin Group, Social Background, and Covariates

	<i>n</i>	Academic track		Reading achievement ^a		Mathematics achievement ^a	
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
		AME (SE)	AME (SE)	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)
Generation status × origin group (Ref.: Majority)							
1st Generation							
Turkey	92	-0.26** (0.08)	0.02 (0.07)	-1.07** (0.12)	-0.62** (0.10)	-0.85** (0.09)	-0.41** (0.08)
FSU	358	-0.20** (0.03)	-0.03 (0.03)	-0.57** (0.06)	-0.24** (0.06)	-0.55** (0.05)	-0.15** (0.05)
Middle & Eastern Europe	98	-0.23** (0.04)	-0.11** (0.04)	-0.56** (0.10)	-0.26** (0.09)	-0.43** (0.10)	-0.05 (0.09)
Southern Europe	134	-0.26** (0.04)	-0.07 (0.04)	-0.81** (0.12)	-0.43** (0.11)	-0.76** (0.09)	-0.35** (0.08)
Rest of world	262	-0.08+ (0.04)	0.02 (0.04)	-0.53** (0.08)	-0.33** (0.06)	-0.51** (0.06)	-0.33** (0.05)
2nd Generation							
Turkey	521	-0.16** (0.05)	0.05 (0.05)	-0.85** (0.07)	-0.55** (0.06)	-0.71** (0.05)	-0.38** (0.05)
FSU	283	-0.13** (0.04)	-0.04 (0.03)	-0.29** (0.07)	-0.12* (0.06)	-0.28** (0.07)	-0.07 (0.05)
Middle & Eastern Europe	192	-0.02 (0.05)	0.01 (0.04)	-0.15+ (0.08)	-0.10 (0.07)	-0.14 (0.09)	-0.06 (0.07)
Southern Europe	249	-0.21** (0.04)	-0.06+ (0.04)	-0.61** (0.09)	-0.33** (0.08)	-0.59** (0.08)	-0.23** (0.06)
Rest of world	357	-0.06 (0.05)	0.04 (0.04)	-0.46** (0.08)	-0.32** (0.06)	-0.47** (0.07)	-0.30** (0.05)
One parent born abroad							
Turkey	196	-0.16* (0.07)	-0.01 (0.06)	-0.77** (0.10)	-0.52** (0.10)	-0.76** (0.07)	-0.47** (0.09)
FSU	69	0.02 (0.06)	0.03 (0.06)	-0.04 (0.12)	-0.05 (0.11)	-0.26+ (0.14)	-0.16 (0.11)
Middle & Eastern Europe	203	-0.04 (0.04)	-0.03 (0.04)	-0.04 (0.08)	-0.01 (0.08)	-0.13 (0.09)	-0.02 (0.06)
Southern Europe	275	-0.07* (0.03)	0.01 (0.03)	-0.21** (0.07)	-0.09 (0.06)	-0.34** (0.06)	-0.19** (0.05)
Rest of world	595	0.04 (0.03)	0.02 (0.02)	0.03 (0.05)	-0.01 (0.04)	-0.10+ (0.05)	-0.12** (0.04)

Table 2 (Continued)

	<i>n</i>	Academic track		Reading achievement ^{a†}			Mathematics achievement ^{a†}	
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	
		AME (SE)	AME (SE)	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)	
3rd Generation								
Turkish (1–4 foreign-born GP)	35	-0.18* (0.08)	-0.09 (0.06)	-0.58** (0.20)	-0.36* (0.14)	-0.56* (0.23)	-0.31+ (0.18)	
FSU (1–4 foreign-born GP)	104	-0.04 (0.05)	-0.09+ (0.05)	0.04 (0.10)	0.01 (0.09)	-0.00 (0.10)	0.03 (0.08)	
<i>Middle & Eastern Europe</i>								
(2–4 foreign-born GP)	145	0.01 (0.05)	0.00 (0.04)	-0.02 (0.09)	-0.03 (0.08)	-0.10 (0.09)	-0.09 (0.09)	
(1 foreign-born GP)	625	0.06* (0.03)	0.04+ (0.02)	0.18** (0.04)	0.11** (0.04)	0.04 (0.04)	-0.00 (0.03)	
<i>Southern Europe</i>								
(2–4 foreign-born GP)	53	-0.02 (0.08)	-0.04 (0.07)	-0.16 (0.14)	-0.19+ (0.11)	-0.31+ (0.16)	-0.26* (0.11)	
(1 foreign-born GP)	191	-0.03 (0.04)	-0.02 (0.03)	0.08 (0.08)	0.09 (0.07)	-0.23** (0.07)	-0.17** (0.06)	
<i>Rest of world</i>								
(2–4 foreign-born GP)	234	-0.03 (0.04)	0.02 (0.03)	-0.04 (0.07)	0.02 (0.06)	-0.23** (0.06)	-0.12* (0.05)	
(1 foreign-born GP)	275	0.05 (0.03)	0.02 (0.03)	0.12+ (0.07)	0.05 (0.06)	0.17* (0.07)	0.11+ (0.06)	
SES ^a	-	-	0.09** (0.01)	-	0.05** (0.01)	-	0.05** (0.01)	
Highest parental education (Ref.: Low-level degree)								
Intermediate level degree	-	-	0.06** (0.01)	-	0.05+ (0.03)	-	0.00 (0.02)	
High level degree	-	-	0.22** (0.02)	-	0.11** (0.03)	-	0.09** (0.03)	
Number of books at home (>100)								
Female	-	-	0.12** (0.01)	-	0.22** (0.02)	-	0.17** (0.02)	
Age ^a	-	-	0.05** (0.01)	-	0.18** (0.02)	-	-0.41** (0.02)	
Academic track	-	-	-0.08** (0.00)	-	-0.09** (0.01)	-	-0.11** (0.01)	
R ²	-	0.03	0.23	0.07	0.30	0.05	0.39	

Note. *N* = 14,958. Multiply imputed data (20 imputations). AME Average Marginal Effect, Average marginal effects show the average change in probability when the independent variable is increased by one unit, SES Socio-economic status, FSU Former Soviet Union, GP Grandparents, R² derived using Rubin's combination rules and ignoring the clustered data structure
^a z-standardized. + *p* < 0.10, * *p* < 0.05, ** *p* < 0.01

with caution. Students with one grandparent born in Southern Europe or with at least two grandparents born in another country (“Rest of world”) on average also score lower on the mathematics test. In contrast, third-generation students with one grandparent of Middle and Eastern European ancestry scored significantly higher on the reading test than majority students. Students who have one grandparent born in a country of the “Rest of world” group performed better in the mathematics test compared to majority students. Overall, our results suggest that the majority-minority gap in school success attenuates across generations and is not significant for most groups of third-generation students. Interpreting this comparison of the different currently enrolled generations of minority students as a proxy for intergenerational integration processes, educational integration appears to have been “completed” by the third generation at the latest. This is consistent with classical and new assimilation theories and the expectation that most groups’ educational achievement improves over generations. Although only tentative, the findings for the Turkish group suggest that barriers, such as discrimination, are at work, which would be in line with classical and new assimilation theory. An alternative explanation might be processes of downward assimilation as proposed by segmented assimilation theory. The higher achievement scores of some third-generation origin groups are difficult to reconcile with classical or new assimilation theory but are in line with predictions for a path of rapid advancement proposed by segmented assimilation theory.

To test our expectations regarding socio-economic background, we added social background indicators to the regressions and also controlled for students’ age and gender (Table 2, Models 2, 4, and 6; see also Appendix Fig. 2 and Tables S.3, S.4, and S.5 in the supplementary information file). Compared to majority students, first-, second- and one-parent-born-abroad students often have less favorite social backgrounds, whereas third-generation students overall have about as much or more resources to build on (see Table 1). Controlling for social background indicators, the majority-minority educational gaps reduce considerably or even diminish completely as expected. Specifically, the gaps between majority and first- and second-generation students reduce (reading and mathematics achievement) or are even non-existent (attendance of academic track). Including social background characteristics hardly changes the findings for the third generation. Accordingly, differences in social background characteristics hardly account for educational differences between majority and third-generation students. This pattern is consistent with classical and new assimilation theories: not only the educational majority-minority gaps reduce across generations, but also the “explanatory power” of social background indicators.⁶ The only major exception to this pattern are third-generation Turkish origin students for whom we observe a significant reduction of the minority-majority gap in academic

⁶ We tested whether the generation status coefficients are different between the second specification including the social background indicators and a specification without SES, parental education, and number of books at home based on regression without survey weights. Except for the diverse “Rest of world” group, all negative educational gaps between majority and all other first- and second-generation groups substantially reduce when social background characteristics are controlled for (all $t < -2.88$, all $p < 0.01$). In contrast, for almost all groups of third-generation students, the differences in coefficients are either not significant (all $t < 1.82$, all $p > 0.05$), or adding social background to the equation results in positive gaps in favor for third-generation students.

track attendance. Again, as the group of third-generation Turkish students is small, results have to be interpreted with caution.

6.3 Does the definition of the third generation matter?

Previous studies used different definitions of the third generation, mostly based on pragmatic reasons (e.g., small group sizes, see Sect. 3.3). However, categorizing one-grandparent-born-abroad students as third generation or as majority may make a difference because the average receiving country-specific resources potentially available to students can differ (see Sect. 3.2). Therefore, we explored whether third-generation students' educational success differs between those with only one foreign-born grandparent and those with two or more foreign-born grandparents.

At first glance, students with one grandparent born abroad are more often found in academic tracks and show slightly better test scores compared to students with two or more grandparents born abroad (Table 1). Given the differences in educational success between some of the origin groups, we only compare the subgroups of third-generation students (one foreign-born grandparent vs. two or more foreign-born grandparents) within origin groups in the following. This limits the analysis to third-generation students with ancestors from Middle and Eastern European countries, Southern European countries, and the rest of the world. Turkish and FSU third-generation subgroups are too small to analyze potential subgroup differences (see Table 1). We formally tested the differences using adjusted Wald tests in the regressions without covariates (Table 2, Models 1, 3, and 5). Most of the differences were not significant. Only students with one foreign-born grandparent from the "Rest of world" group tended to attend the academic track more often ($F(1, 538.0)=3.21$, $p=0.07$) and score higher on the mathematics test ($F(1, 512.8)=20.75$, $p<0.01$) than their counterparts with two or more foreign-born grandparents. In addition, students with only one grandparent born in Middle or Eastern Europe score significantly higher on the reading comprehension test than their counterparts with two or more Middle and Eastern European grandparents ($F(1, 471.3)=4.37$, $p<0.05$). In sum, our results suggest that for educational success the number of foreign-born grandparents only plays a minor role compared to the remaining origin group differences.

7 Discussion

Numerous studies showed that minority students who were born abroad or whose parents were born abroad often show lower levels of school success than their majority peers. Very little is known, however, on whether these educational disadvantages persist for the grandchildren of immigrants, i.e., the third generation. Our study addressed this issue and focused on the educational success of third-generation students in Germany. Using data from a nationwide study enabled us to precisely identify third-generation students and to distinguish origin groups according to their ancestors' countries of birth.

Our findings from the bivariate analyses reveal that third-generation students, overall, did not show lower levels of educational success than their majority peers, neither regarding their attendance of academic tracks nor regarding their German reading and mathematics achievements. Examining the educational success of third-generation students in more detail, however, revealed that educational success varied across origin groups and to some extent also within origin groups across different definitions of the third generation (according to the number of foreign-born grandparents). While most of the origin groups did not differ from their majority peers in their educational success, the only 35 observed students whose grandparents migrated from Turkey showed lower levels of school success on all indicators compared to their majority peers. Within the groups of students with grandparents born in Middle or Eastern Europe, Southern Europe, or another country, we could distinguish different third-generation subgroups according to the number of foreign-born grandparents. Students with only one grandparent born in Middle or Eastern Europe outperformed their majority peers on two dimensions (academic track and reading comprehension). Students with one grandparent born in Southern Europe or with at least two grandparents born in another country (“Rest of world” group) scored lower on the mathematics test. Comparisons between third-generation students with one versus at least two grandparents born abroad within each origin group revealed that students with one foreign-born grandparent showed significantly more educational success in only three out of nine possible comparisons. The inclusion of social background indicators reduced the majority-minority educational gaps for first- and second-generation students, while it hardly changed the findings for the third generation.

Our results are in line with previous research that found no overall differences between third-generation and majority members (Ludwig-Mayerhofer et al. 2020). They are also in line with previous findings on lower levels of educational success of third-generation labor immigrants in general (Hunkler 2014) and third-generation students of Turkish descent in particular (Fick et al. 2014; Olczyk et al. 2016a; Dollmann 2010 for reading achievement). Our study thus consolidates previous research and extends the existing literature by showing that the results do not only depend on the origin groups but also differ slightly by how the third generation is defined. Although we found small differences for single groups only, the results suggest that the level of students’ host country-specific resources potentially increases with every family member born in the receiving country. Thus, our results suggest that the definition of third-generation students is not an arbitrary decision. However, our findings show that the grandparents’ countries of origin are also relevant.

A possible explanation for the findings on the lower success of some origin groups is that grandparents from Turkey and Southern Europe in our study were likely to be labor immigrants with comparably low socio-economic positions. Within these families, intergenerational mobility may have progressed slower than in families with more receiving country-specific socio-economic resources. This is also in line with our finding that the socio-economic gaps between these groups and majority members tended to be larger. The slower social mobility and educational integration may also result from barriers, as persons whose families migrated as labor immigrants, particularly from Turkey, still face negative stereotypes and prejudices (e.g.,

Froehlich et al. 2016) and often experience discrimination and rejection from majority members (e.g., Tucci et al. 2014). Another reason may be the students' social embeddedness resulting in only limited access to social capital that is beneficial in the receiving society. Previous research found that students of Turkish descent were often embedded in Turkish networks. However, the study also showed that they particularly benefitted from their majority peers in their school adjustment (Lorenz et al. 2021b). However, as the group of third-generation Turkish students in our study was small, the findings are tentative and should be interpreted with caution.

A potential explanation for the higher achievement levels of third-generation students of Middle and Eastern European descent may be the characteristics of their co-ethnic community, including their values, beliefs, and normative expectations about school success. However, it is well-known that families of Turkish descent also hold high educational aspirations and expectations in Germany (e.g., Salikutluk 2016). This suggests that further research is needed to disentangle the mechanisms that result in the variation of educational success between these groups.

Overall, our findings suggest a pattern consistent with the expectations of classical and new assimilation theories. Third-generation students overall and also most of the distinguished origin groups were similarly successful as majority students. Moreover, we found that the minority-majority gaps in educational success diminished across generations, suggesting that the educational gaps decrease with increasing receiving country-specific resources available to the student. This interpretation is further substantiated by the pattern of social background effects. Along with generation status, the relevance of social background indicators in explaining differences in educational success decreased and we found only small effects for the third generation. In sum, educational integration appears to have been "completed" by the third generation at the latest. For some groups, however, we do not observe the major trends predicted by classical and new assimilation theories. The persisting educational gaps for some third-generation labor immigrant descendants could point to barriers these students or their ancestors face that slow down intergenerational integration. Another possible explanation would be segmented assimilation of their ancestors characterized by jobs with fewer options for upward mobility. The finding that some third-generation groups show higher levels of achievement than majority students cannot be reconciled with classical or new assimilation theories but with arguments on rapid advancement proposed by segmented assimilation theory.

8 Limitations

Our study has several limitations. *First*, we were not able to analyze intergenerational educational integration across three generations directly. However, our analyses suggest that immigration patterns seem to be relatively stable across generations so our comparisons of current first-, second-, and third-generation students give some indication of intergenerational integration processes.

Second, due to data limitations, we could not distinguish origin regions as detailed as we would have wished. For instance, we collapsed students with Polish ancestry and students of other Eastern European and Middle European descent.

This limitation also concerns the results for third-generation students of Turkish ancestry. Given that this group comprised only 35 students in our analyses, the results are tentative and should be interpreted with caution. Future research is needed that investigates third-generation students' educational success based on larger sample sizes that allow a more nuanced investigation of subgroups. For instance, using data from large-scale assessments such as the German National Assessment Study (e.g., Stanat et al. 2022), or pooling different datasets to increase statistical power may be promising.

Third, we provided a comprehensive yet largely descriptive overview of the educational success of especially the third generation but were not able to explore the proposed mechanisms, such as the role of norms and networks in ethnic communities or discrimination, directly. Future studies should address these issues. Moreover, they should also investigate whether cultural identities of third-generation students, including their self-categorizations, contribute to the explanation of their educational integration.

Fourth, due to substantial parental nonresponse, we had to rely on students' proxy reports for the central measures of parental socio-economic status and highest parental education. Previous research has shown that student reports of their parents' occupational status were relatively reliable, while their reports of their parents' education were less accurate (Engzell and Jonsson 2015). However, the findings also revealed that controlling for—to some extent—less accurate student reports of their parental occupational status and educational level hardly changed the estimates for ethnic minority-majority educational gaps (Engzell and Jonsson 2015). We would thus assume that using the proxy reports would not substantially affect our central conclusion on ethnic minority-majority gaps in education.

A *fifth* limitation is that our generation status variable did not capture whether there are substantial differences in receiving country-specific resources within the group of students with two grandparents born abroad. It may make a difference whether students have a family tree with both grandparents born abroad on one parental branch or whether they have a family tree with one grandparent born abroad on each parental branch. Students having German-born grandparents on each parental branch may have opportunities for receiving country-specific support from both branches of the family tree. Moreover, both parents would have one German-born parent, which might also increase the level of receiving country-specific resources in the family. We refrained from distinguishing between these branches in our study because it would have resulted in too small group sizes.

9 Conclusion

Our study extends existing research on educational integration across immigrant generations in Germany. Our findings reveal that educational success did not differ between most of the third-generation origin groups and majority students, while most groups of first- and second-generation students, on average, were significantly less successful. Our findings thus suggest that educational integration in Germany is mostly “completed” by the third generation, although this pattern does not uni-

formly apply to all of the third-generation groups under investigation. Hence, while a critical review of the reasonableness of the “third generation” concept is important (see Fachkommission Integrationsfähigkeit 2021), our research hints at potential obstacles to the educational integration of some groups of third-generation students and is thus important.

10 Appendix

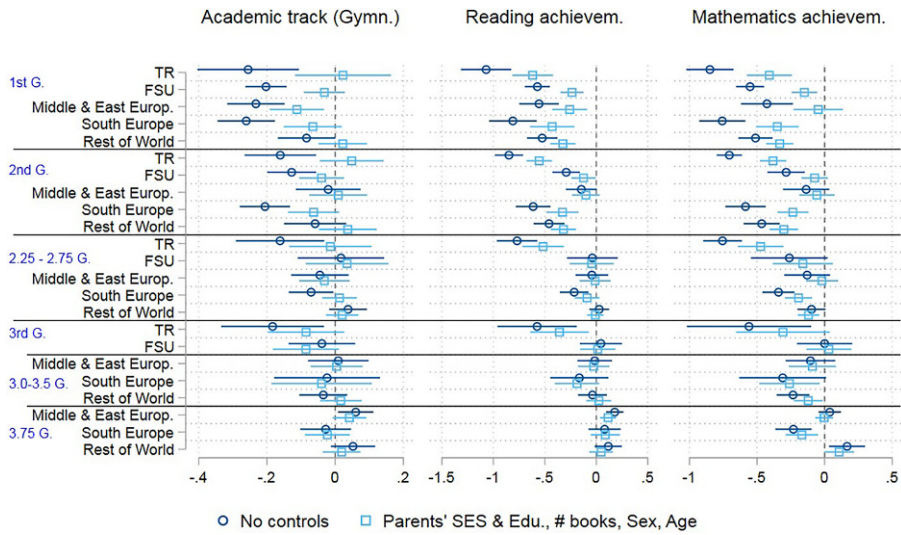


Fig. 2 Average Marginal Effects from Linear Probability Models (Academic Track) and OLS-Regressions (Achievement Scores) Predicting Educational Success by Generational Status. $N=14,958$. Achievement scores are z-standardized. Point estimates, 95%-confidence intervals (bars), showing average marginal effects based on multiply imputed data

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Conflict of interest C. Hunkler and K. Schotte declare that they have no competing interests. The authors have no relevant financial or non-financial interests to disclose. The authors have no competing interests to declare relevant to this article's content. All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript. The authors have no financial or proprietary interests in any material discussed in this article.

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References

- Alba, R., & Foner, N. (2015). *Strangers no more: Immigration and the challenges of integration in North America and Western Europe*. University Press.
- Alba, R., & Nee, V. (2003). *Remaking the American mainstream. Assimilation and contemporary immigration*. Harvard: University Press. <https://doi.org/10.4159/9780674020115>
- Asbrock, F., Lemmer, G., Becker, J. C., Koller, J., & Wagner, U. (2014). "Who are these foreigners anyway?" The content of the term foreigner and its impact on prejudice. *SAGE open*, 4(2), 1–8. <https://doi.org/10.1177/2158244014532819>.
- Aßmann, C., Steinhauer, H. W., Kiesel, H., Koch, S., Schönberger, B., Müller-Kuller, A., Rohwer, G., Rässler, S., & Blossfeld, H.-P. (2011). Sampling designs of the national educational panel study: challenges and solutions. *Zeitschrift für Erziehungswissenschaft*, 14(2), 51–65. <https://doi.org/10.1007/s11618-011-0181-8>.
- 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., & 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*. <https://doi.org/10.1177/01979183221112404>.
- Blossfeld, H.-P., & Roßbach, H.-G. (Eds.). (2019). *Education as a lifelong process: The German National Educational Panel Study (NEPS)* (2nd ed.). Wiesbaden: Springer VS.
- Brunner, M., Stallasch, S., & Lüdtke, O. (2023). Empirical benchmarks to interpret intervention effects on student achievement in elementary and secondary school: meta-analytic results from Germany. *Journal of Research on Educational Effectiveness*. <https://doi.org/10.1080/19345747.2023.2175753>.
- Bukodi, E., & Goldthorpe, J.H. (2013). Decomposing ‘social origins’: the effects of parents’ class, status, and education on the educational attainment of their children. *European Sociological Review*, 29(5), 1023–1039.
- Diehl, C., Hunkler, C., & Kristen, C. (2016). Ethnische Ungleichheiten im Bildungsverlauf. Eine Einführung. In C. Diehl, C. Hunkler & C. Kristen (Eds.), *Ethnische Ungleichheiten im Bildungsverlauf* (pp. 3–31). Wiesbaden: Springer VS. https://doi.org/10.1007/978-3-658-04322-3_1.
- Dollmann, J. (2010). *Türkischstämmige Kinder am ersten Bildungübergang. Primäre und sekundäre Herkunftseffekte* (1st ed.). VS Verlag für Sozialwissenschaften. <https://doi.org/10.1007/978-3-531-92461-8>.
- Duchhardt, C., & Gerdes, A. (2013). *NEPS Technical report for mathematics—scaling results of starting cohort 4 in ninth grade* (NEPS Working Paper No. 22). https://www.neps-data.de/Portals/0/Working%20Papers/WP_XXII.pdf.
- Dustmann, C., & Theodoropoulos, N. (2010). Ethnic minority immigrants and their children in Britain. *Oxford Economic Papers*, 62(2), 209–233. <https://doi.org/10.1093/oepp/gpq004>.
- Engzell, P., & Jonsson, J.O. (2015). Estimating social and ethnic inequality in school surveys: Biases from child misreporting and parent nonresponse. *European Sociological Review*, 31(3), 312–325. <https://doi.org/10.1093/esr/jcv005>.
- Esser, H. (2008). Assimilation, ethnische Schichtung oder selektive Akkulturation? Neuere Theorien der Eingliederung von Migranten und das Modell der intergenerationalen Integration. *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 48, 81–107.
- Fachkommission Integrationsfähigkeit (2021). *Gemeinsam die Einwanderungsgesellschaft gestalten*. Bericht der Fachkommission der Bundesregierung zu den Rahmenbedingungen der Integrationsfähigkeit. <https://www.integrationsbeauftragte.de/resource/blob/1872554/1875934/5a5d62f9636b87f10fd0e271ba326471/2021-01-20-bericht-fachkommission-data.pdf?download=1>. Accessed: 8 March 2022.
- Fick, P., Wöhler, T., Diehl, C., & Hinz, T. (2014). *Integration gelungen? Die fünf größten Zuwanderergruppen in Baden-Württemberg im Generationenvergleich*. Universität Konstanz. <http://nbn-resolving.de/urn:nbn:de:bsz:352-0-264092>
- Fordham, S., & Ogbu, J.U. (1986). Black students’ school success: Coping with the „burden of ‘acting white’”. *The Urban Review*, 18(3), 176–206. <https://doi.org/10.1007/BF01112192>.
- Froehlich, L., & Schulte, I. (2019). Warmth and competence stereotypes about immigrant groups in Germany. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0223103>.
- Froehlich, L., Martiny, S. E., Deaux, K., & Mok, S. Y. (2016). “It’s their responsibility, not ours”: stereotypes about competence and causal attributions for immigrants’ academic underperformance. *Social Psychology*, 47(2), 74–86. <https://doi.org/10.1027/1864-9335/a000260>.
- Ganzeboom, H. B. G. (2010). *A new international socio-economic index (ISEI) of occupational status for the international standard classification of occupation 2008 (ISCO-08) constructed with data from the ISSP 2002–2007*. Annual Conference of International Social Survey Programme, Lisbon. [http://www.harryganzeboom.nl/Pdf/2010%20-%20Ganzeboom-ISEI08-ISSP-Lisbon-\(paper\).pdf](http://www.harryganzeboom.nl/Pdf/2010%20-%20Ganzeboom-ISEI08-ISSP-Lisbon-(paper).pdf).
- Gehrer, K., Zimmermann, S., Artelt, C., & Weinert, S. (2013). NEPS framework for assessing reading competence and pilot from an adult pilot study/NEPS-Rahmenkonzeption zur Messung von Lesekompetenz und Resultate einer Pilotstudie mit Erwachsenen. *Journal for Educational Research Online*, 5(2), 50–79. <https://doi.org/10.25656/01:8424>
- Gordon, M.M. (1964). *Assimilation in American life: The role of race, religion, and national origins*. Oxford: University Press.
- Gresch, C., Maaz, K., Becker, M., & McElvany, N. (2012). Zur hohen Bildungsaspiration von Migranten beim Übergang von der Grundschule in die Sekundarstufe: Fakt oder Artefakt? In P. Pielage, L. Pries & G. Schultze (Eds.), *Soziale Ungleichheit in der Einwanderungsgesellschaft: Kategorien, Konzepte, Einflussfaktoren* (pp. 56–67). Friedrich-Ebert-Stiftung (WISO-Diskurs).

- Haberkorn, K., Pohl, S., Hardt, K., & Wiegand, E. (2012). *NEPS technical report for reading—Scaling results of starting cohort 4 in ninth grade* (NEPS Working Paper No. 16). https://www.neps-data.de/Portals/0/Working%20Papers/WP_XVI.pdf.
- Heath, A. F., & Brinbaum, Y. (2014). *Unequal attainments: Ethnic educational inequalities in ten Western countries* (1st ed.). The British Academy by Oxford University Press.
- Heath, A. F., Rethon, C., & Kilpi, E. (2008). The second generation in Western Europe: education, unemployment, and occupational attainment. *Annual Review of Sociology*, 34(1), 211–235. <https://doi.org/10.1146/annurev.soc.34.040507.134728>.
- Heptt, B., Olczyk, M., & Volodina, A. (2022). Number of books at home as an indicator of socioeconomic status: Examining its extensions and their incremental validity for student achievement. *Social Psychology of Education*, 25, 903–928. <https://doi.org/10.1007/s11218-022-09704-8>.
- Hout, M. (2012). Social and economic returns to college education in the United States. *Annual Review of Sociology*, 38(1), 379–400. <https://doi.org/10.1146/annurev.soc.012809.102503>.
- Hunkler, C. (2014). *Ethnische Ungleichheit beim Zugang zu Ausbildungsplätzen im dualen System*. Wiesbaden: Springer. <https://doi.org/10.1007/978-3-658-05494-6>.
- Kalter, F. (2006). In search of an explanation for the specific labor market disadvantages of second generation Turkish migrant children. *Zeitschrift für Soziologie*, 35(2), 144–160.
- Kogan, I. (2011). New immigrants—Old disadvantage patterns? Labour market integration of recent immigrants into Germany. *International Migration*, 49(1), 91–117. <https://doi.org/10.1111/j.1468-2435.2010.00609.x>.
- Kroneberg, C. (2008). Ethnic communities and school performance among the new second generation in the United States: testing the theory of segmented assimilation. *The ANNALS of the American Academy of Political and Social Science*, 620(1), 138–160. <https://doi.org/10.1177/0002716208322714>.
- Lorenz, G., Boda, Z., & Salikutluk, Z. (2021a). Oppositional culture revisited. Friendship dynamics and the creation of social capital among Turkish minority adolescents in Germany. *Journal of Ethnic and Migration Studies*, 47(17), 3986–4005. <https://doi.org/10.1080/1369183X.2021.1898354>.
- Lorenz, G., Salikutluk, Z., Boda, Z., Jansen, M., & Hewstone, M. (2021b). The link between social and structural integration: co- and interethnic friendship selection and social influence within adolescent social networks. *Sociological Science*, 8, 371–396. <https://doi.org/10.15195/v8.a19>.
- Ludwig-Mayerhofer, W., Stawarz, N., & Wicht, A. (2020). Familienkonstellation und Bildungserfolg. Welche Rolle spielen ökonomisches, kulturelles und Sozialkapital? *Soziale Welt*, 71(3), 235–267. <https://doi.org/10.5771/0038-6073-2020-3-235>.
- Maciejewski, L., Hunkler, C., Harder, N., & Schotte, K. (2022). Wer gehört zur dritten Generation? Über die Herausforderungen der definitorischen und empirischen Bestimmung. *Zeitschrift für Migrationsforschung*, 2(1), 151–163. <https://doi.org/10.48439/zmf.v2i1.159>
- NEPS Network (2021). *National Educational Panel Study, scientific use file of starting cohort grade 9 (SC4)*. Bamberg: Leibniz Institute for Educational Trajectories (LIfBi). <https://doi.org/10.5157/NEPS:SC4:11.0.0>.
- Neumann, I., Duchhardt, C., Grüßing, M., Heinze, A., Knopp, E., & Ehmke, T. (2013). Modeling and assessing mathematical competence over the lifespan / Modellierung und Erfassung mathematischer Kompetenz über die Lebensspanne. *Journal for Educational Research Online*, 5(2), 80–109. <https://doi.org/10.25656/01:8426>
- Ogbu, J. U. (2004). Collective identity and the burden of ‘acting white’ in black history, community, and education. *The Urban Review*, 36(1), 1–35. <https://doi.org/10.1023/B:URRE.0000042734.83194.f6>
- Olczyk, M., & Will, G. (2019). *Measuring knowledge about the German education system in NEPS* (NEPS Survey Paper No. 56). Bamberg: Leibniz Institute for Educational Trajectories, National Educational Panel Study. https://www.neps-data.de/Portals/0/Survey%20Papers/SP_LVI.pdf.
- Olczyk, M., Will, G., & Kristen, C. (2014). Personen mit Zuwanderungshintergrund im NEPS: Zur Bestimmung von Generationenstatus und Herkunftsgruppe (NEPS Working Paper No. 41). https://www.neps-data.de/Portals/0/Working%20Papers/WP_XXXXIa.pdf. Accessed: 15 November 2020
- Olczyk, M., Seuring, J., Will, G., & Zinn, S. (2016a). Migranten und ihre Nachkommen im deutschen Bildungssystem: Ein aktueller Überblick. In C. Diehl, C. Hunkler & C. Kristen (Eds.), *Ethnische Ungleichheiten im Bildungsverlauf* (pp. 33–70). Wiesbaden: Springer VS. https://doi.org/10.1007/978-3-658-04322-3_2.
- Olczyk, M., Will, G., & Kristen, C. (2016b). *Personen mit Zuwanderungshintergrund im NEPS: Zur Bestimmung von Generationenstatus und Herkunftsgruppe (Supplement)* (Supplement to NEPS Working Paper 41). https://www.neps-data.de/Portals/0/Working%20Papers/Supplement_WP_XLIa.pdf. Accessed 15 November 2020

- Organization for Economic Co-operation and Development (1999). *Measuring student knowledge and skills: A new framework for assessment*. Paris: OECD Publishing.
- Organization for Economic Co-operation and Development (2016). *PISA 2015 results (volume I): Excellence and equity in education*. Paris: OECD. <https://doi.org/10.1787/9789264266490-en>.
- Portes, A., & Rumbaut, R. G. (2014). *Immigrant America: A portrait*. University of California Press.
- Portes, A., & Zhou, M. (1993). The new second generation: Segmented assimilation and its variants. *Annals of the American Academy of Political and Social Science*, 530(1), 74–96. <https://doi.org/10.1177/0002716293530001006>.
- Prevo, M. J. L., Malda, M., Mesman, J., & van IJzendoorn, M. H. (2016). Within- and cross-language relations between oral language proficiency and school outcomes in bilingual children with an immigrant background: A meta-analytical study. *Review of Educational Research*, 86(1), 237–276. <https://doi.org/10.3102/0034654315584685>.
- Salikutluk, Z. (2016). Why do immigrant students aim high? Explaining the aspiration—achievement paradox of immigrants in Germany. *European Sociological Review*, 32(5), 581–592. <https://doi.org/10.1093/esr/jcw004>.
- Schimany, P., & Baykara-Krumme, H. (2012). Zur Geschichte und demografischen Bedeutung älterer Migrantinnen und Migranten in Deutschland. In H. Baykara-Krumme, P. Schimany & A. Motel-Klingebiel (Eds.), *Viele Welten des Alterns* (pp. 43–73). Wiesbaden: Springer VS. https://doi.org/10.1007/978-3-531-19011-2_2.
- Stanat, P., Schipolowski, S., Mahler, N., Weirich, S., & Henschel, S. (2022). *IQB-Bildungstrend 2018. Mathematische und naturwissenschaftliche Kompetenzen am Ende der Sekundarstufe I im zweiten Ländervergleich*. Münster: Waxmann.
- Steinhauer, H. W., & Zinn, S. (2016). *NEPS technical report for weighting: Weighting the sample of starting cohort 4 of the National Educational Panel Study (Wave 1 to 6)*. Bamberg: Leibniz Institute for Educational Trajectories. https://www.neps-data.de/Portals/0/Survey%20Papers/SP_II.pdf
- Tucci, I., Eisnecker, P., & Brücker, H. (2014). Wie zufrieden sind Migranten mit ihrem Leben? *DIW Wochenbericht*, 81(43), 1152–1158.