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Interpersonal influences on educational expectations: New evidence for Germany

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Abstract

Previous research casts doubt on whether interpersonal influences on students' expectations exist in highly stratified education systems after students have been tracked into different secondary school types. Against this background, we examine the influence of parents and friends on the educational expectations of secondary school students in the highly stratified German education system. For the analyses we use unique representative data from the German National Educational Panel Study (NEPS). In addition to standard cross-sectional analyses, school fixed-effects models and longitudinal fixed-effects panel regressions are conducted, which make it possible to rule out a large number of factors that might be responsible for a spurious relationship. Across all analyses, we consistently find substantive influences of parents and friends on the expectations of secondary school students.

1. Introduction

There is a broad consensus that educational expectations and aspirations,¹ of students are a crucial predictor of their later educational career, and previous research has repeatedly demonstrated their importance for academic outcomes and the explanation of educational inequalities (Chowdry, Crawford, & Goodman, 2011; Portes, Aparicio, Haller, & Vickstrom, 2010). Therefore, it is of great significance to know which factors shape educational aspirations and expectations. It is commonly assumed that students' wishes and expectations about their future educational career are not only influenced by their educational performance but also by their parents and friends (Coleman, 1988; Sewell, Haller, & Portes, 1969; Sewell, Haller, & Ohlendorf, 1970). For many adolescents, these persons represent the most important social relationships, which is why they are also called 'significant others'. Parents and friends are assumed to exert influence on students since social educational norms that prevail within the close social network can shape students' values and consequently their educational wishes and expectations. Furthermore, these persons may serve as role models

for the students. Moreover, they are able to affect students' expectations by supplying important information regarding the education system and by providing resources or other assistance (Roth & Salikutluk, 2012).

Previous empirical findings indicate that there are indeed substantial interpersonal influences on students' expectations and aspirations (e.g., Cheng & Starks, 2002; Chenoweth & Galliher, 2004; Feliciano, 2006; Portes et al., 2010; Wells et al., 2011). Since this research mainly relates to North America, there is, however, a lack of clarity about the extent to which these results can also be transferred to other countries. In particular, there are theoretical and empirical doubts as to whether friends and parents exert influence on secondary school students' expectations in highly stratified education systems (Buchmann & Dalton, 2002). Here, secondary students attend different school types that are clearly distinct, e.g., with respect to performance requirements and type of school leaving qualification. In contrast to open and undifferentiated education systems, the type of school attended at secondary level therefore strongly determines the expectations of the students and consequently there might be little or no room for interpersonal influences. Since Germany is a prime example of a highly stratified education system,² in this paper we will theoretically and

¹ 1 While (idealistic) educational aspirations refer to future educational qualifications hoped for, educational expectations refer to future educational qualifications actually expected, which means that in the expectations restrictions are taken into account (Becker, 2010; Haller, 1968). Educational expectations are sometimes also called realistic aspirations or anticipated educational decisions (Salikutluk, 2016).

² 2 Compared with other countries, the German education system can be described as a highly stratified one (Müller, 2005), in which school tracking takes place at an early age. In most of the German federal states, students are tracked into different secondary schooltypes as early as after grade four (at age ten). In three out of sixteen federal states, tracking takes place after grade six (at age twelve) (Sekretariat der Kultusministerkonferenz, 2010). The various secondary school types are clearly distinct with respect to performance requirements, curricula, years until graduation, and type of school leaving qualification. The proportion of students who switch between secondary school types is comparatively low. Due to the features of the German education system, the transition after elementary school is a crucial stage, and the type of secondary school attended has longlasting effects on the educational success (Kristen, Shavit, Chachashvili-Bolotin, Roth, & Adler, 2014).

empirically examine the question of whether there are interpersonal influences on the expectations of students in Germany. We will analyze adolescents at the end of secondary level I,³ hence at a point in time within their school career at which the students have already been attending the different types of secondary school for several years. For the empirical analyses, we use data of the German National Educational Panel Study (NEPS)(Blossfeld, Roßbach, & von Maurice, 2011), which is representative, longitudinal, and contains a high number of cases. The unique dataset enables us to carry out a series of in-depth analyses, on the basis of which a large number of factors that might be responsible for a spurious relationship can be ruled out. This means that the dataset, together with the used analysis strategies, is suitable to overcome important shortcomings of relevant previous empirical studies. The main aim of this paper is to improve our knowledge about interpersonal influences on educational expectations by analyzing them in an institutional context that makes them rather unlikely. Due to the features of the German education system, it can be assumed that interpersonal influences on secondary school students in Germany are among the least pronounced compared to other countries. Therefore, if such influences can be demonstrated in relation to German secondary school students, this would be not only of importance for Germany but also for international research, because it would indicate that such influences also exist in many other countries. The paper is structured as follows: First, the theory behind why friends and parents are assumed to influence students' expectations is outlined briefly. On this basis, it is discussed how characteristics of education systems can affect the strength of this connection and whether interpersonal influences on the expectations of German secondary school students are to be expected. In addition, previous relevant empirical findings are discussed. Subsequently, the data, the variables used, and the strategy of analysis are set out, followed by the presentation of the empirical analyses. Finally, the results are summarized and a conclusion is drawn.

2. Theory and hypotheses

2.1. Interpersonal influences on educational expectations

The investigation of interpersonal influences on educational aspirations and expectations of students has a long research tradition, which was particularly stimulated by the Wisconsin model developed by Sewell et al. (Sewell et al., 1969; Sewell, Haller, & Ohlendorf, 1970). Building on Blau and Duncan's model of status attainment (1967), Sewell and colleagues developed a more complex model of status attainment, which besides sociostructural factors also contains social psychological mediator variables. In their model, a key determinant of educational attainment is the educational aspirations of students. These are in turn strongly influenced by significant others, whereby especially the peer group and the parents are considered to be relevant (Sewell et al., 1969).⁴ Significant others can exert influence first because the social environment may define wishes and normative expectations as to students' school careers which the students want to fulfill in order not to jeopardize their social standing and to avoid sanctions. Secondly, significant others can also shape the educational plans of students in a rather indirect way, given that their predominant educational plans and educational qualifications represent a reference point a student might strive for. This means that social contacts can be both role models and definers of norms (Portes, 1998; Sewell et al., 1969; Woelfel & Haller, 1971), with peers typically acting as models whose educational plans are imitated by students and parents typically being definers of educational expectations and aspirations that students adopt (Morgan, 1998). In the original version of the Wisconsin model, educational aspirations and educational expectations are not explicitly distinguished, but the theoretical arguments imply interpersonal influences on both (Becker, 2010).⁵ Although there have been several revisions and modifications of the original Wisconsin model, the fundamental assumption that significant others affect educational aspirations and expectations has not been challenged (Gabay-Egozi, Shavit, & Yaish, 2015).

The assumption that norms, values, and aspirations of the social environment affect the beliefs and expectations of persons and ultimately their sociostructural position in society is also highlighted in various social capital approaches. Additionally, the accessibility of information and resources via social ties is emphasized in social capital approaches (Bourdieu, 1977; Coleman, 1988; Hoenig, Pollack, Schulz, & Stocké, 2016; Khattab, 2002; Lin, 2006; Wells et al., 2011). For example, in our case, it can have a positive impact on the subjective belief of being able to achieve a higher level of educational qualification and therefore on the educational expectations of students if they know that their friends and parents are able and willing to provide them with relevant information and support during their future educational career (e.g., through coaching). Despite several differences between the various social capital approaches and the Wisconsin model, it can generally be said that they are not mutually exclusive but rather overlap and complement each other (Hoenig et al., 2016). In addition, the basic assumptions about the impact of educational aspirations and plans of friends and parents on students' educational expectations, which can be empirically tested in our study, remain unchanged—no matter which perspective is taken. Based on the arguments of the Wisconsin model and of social capital approaches, it can therefore be concluded that social contacts can influence the educational expectations of students by altering the type of graduation regarded as adequate, pointing out the value of education, and affecting the subjective probability of successfully attaining a higher educational level (Becker & Gresch, 2016; Becker, 2010; Roth & Salikutluk, 2012). In this context, the most important significant others for the majority of adolescents are likely to be their friends and parents.

2.2. Cross-national variation in interpersonal influences on educational expectations

In the previous section it was theoretically discussed how friends and parents can generally influence the educational expectations of students. In addition, it can be expected that the extent of interpersonal influences on students' expectations at secondary level depends on characteristics of the education system (Buchmann & Dalton, 2002). In this respect, particularly stratification is said to be of great importance. In highly stratified education systems like the German one, students are tracked into different

³ The term secondary level I (Sekundarstufe I) denotes the secondary school years until grade 10.

⁴ In addition, also the role of teachers has been highlighted in the Wisconsin model, which will not be addressed in the present paper, however.

⁵ In their empirical analyses, Sewell et al. (1969) use a dependent variable which is located somewhere between educational aspirations and educational expectations (respondents were asked whether they plan to attend college).

school types that are clearly distinct with respect to performance requirements, curricula, years until graduation, and common type of school leaving qualification already after elementary school contrast to open and undifferentiated education systems, the type of school attended at secondary level therefore strongly determines the later educational attainment and with it the expectations of students in highly stratified systems (Buchmann & Park, 2009). Thus interpersonal influence might be subordinate or even irrelevant. Moreover, it has to be kept in mind that friends of students who attend the same school are more likely to have similar aspirations and expectations, which is due to the stronger homophily within schools in stratified systems. Overall, it has therefore been argued that significant others exert only very limited or even no additional influence on students' expectations in highly stratified education systems after tracking into different secondary school types has taken place (Buchmann & Dalton, 2002).

While the theoretical argumentation in support of cross national variations is convincing, it seems questionable whether there are really no additional substantive interpersonal influences to be expected in highly stratified systems. Even though the type of secondary school attended is an important determinant of educational success, it is after all possible also in highly stratified education systems to change the school type at secondary level or to continue with general upper secondary education and to take the university entrance qualification (Abitur) after having graduated with an intermediate secondary school leaving qualification the end of grade 10. In Germany, the Gymnasium is the most prestigious and challenging secondary school type, and a graduation from it entitles students to enroll at university. However, a significant proportion of adolescents who did not attend Gymnasium at secondary level I actually succeed in obtaining the Abitur afterwards. Moreover, not all students who attend Gymnasium at secondary level I complete their school career with the Abitur (Hillmert Jacob, 2010; Jacob & Tieben, 2009; Schneider, 2008). The connection between the school type attended and the highest educational qualification is therefore strong but by no means deterministic, which is why it is also unlikely that students' expectations are completely determined by the type of school attended. Consequently, there is enough room for interpersonal influences on the educational expectations of students.

It is also important to note that even in highly stratified education systems there are marked differences in performance between the students within the individual school types, and their expectations are not completely homogeneous either. In highly stratified education systems, friends within the same school might thus still differ in terms of their expectations. In addition, the friendship network of adolescents is usually not limited to schoolmates but includes friends made in their spare time during non-school activities. These non-school friends are expected to be as heterogeneous in highly stratified systems as they are in less stratified ones.

2.3. Hypotheses

In the light of the foregoing, it seems likely that interpersonal influences on students' expectations are indeed weaker in highly stratified educational systems than in less stratified systems. Even in highly stratified education systems, there are nevertheless compelling reasons to assume that social contacts have substantial effects on educational expectations of students after tracking has taken place. This should be true for both parents' and friends' influence. More precisely, we hypothesize the following for students at the end of secondary level I in Germany:

Hypothesis 1. Parents' educational aspirations for their child have a substantial effect on the child's educational expectations, net of academic achievement, family background, and friends' influence.

Hypothesis 2. Friends' educational plans have a substantial effect on a student's educational expectations, net of academic achievement, family background, and parents' influence.

3. Previous empirical findings

By way of an international comparative analysis, Buchmann and Dalton (2002) tested their assumption that the influence of friends and parents at secondary school level varies depending on the stratification of the education system. On the basis of the TIMSS data, they examined the influence of parents' and friends' attitudes regarding the importance they placed on the student performing well in mathematics on the educational expectations of seventh and eighth graders in 12 countries. The results of the study clearly confirmed their hypotheses. In education systems with low stratification, e.g., in the US, clear effects of parents' and friends' attitudes were demonstrated, while no significant connection to student's expectations was shown in the highly stratified systems of Germany, Austria, and Switzerland. These results suggest that the findings of studies undertaken in the United States and other countries with school systems that are weakly stratified cannot readily be transferred to countries with highly stratified education systems, in which adolescents attend different types of secondary school. However, concerning the empirical finding that there exist no interpersonal influences at all in highly stratified education systems after tracking has taken place, it has to be noted that this might be due to the operationalization of the central independent variables. As Buchmann and Dalton (2002) themselves point out, students' responses to the statements used in the survey, i.e., "My friends think it is important for me to do well in mathematics in school" and "My mother thinks it is important for me to do well in mathematics in school", only refer to achievements in mathematics, which is why friends' and parents' influence on the more general educational expectations of adolescents is probably underestimated (Buchmann & Dalton, 2002).

Contrary to the comparative study, two German studies suggest that interpersonal influences indeed exist in the highly stratified education system of Germany even after school tracking has taken place (Schuchart, 2009; Watermann & Maaz, 2006). However, no explicit statements can be made on the basis of these studies about the influence of friends and parents of the students since these were not investigated separately. Instead, a common score was used for a number of important persons in the adolescents' environment. Additionally, the dependent variables used do not clearly distinguish between aspirations and expectations but are rather a mixture of both. Furthermore, the sample of each of the two studies is restricted to one federal state and to either the highest or the lowest secondary school type. Two recent studies which have examined the influence of friends and parents separately show connections of both groups of persons to the educational expectations of secondary school children (Roth, 2014; Salikutluk, 2013). However, both studies are based on a non-representative sample conducted in three federal states in which students attending German Gymnasium are not taken into account and students with a migration background are clearly overrepresented. In addition, both in the German studies and in the international comparative study the findings are based on cross-sectional analyses in which only a limited amount of potentially biasing factors are considered. Based on the different limitations, it is as yet uncertain whether the friends and parents of students exert a

substantial influence on students' expectations in the highly stratified education system of Germany after students have been tracked into different secondary school types. This is why it shall hereafter be examined in more detail whether there are any substantial interpersonal influences on secondary school students in Germany. The analyses are based on current data which is uniquely well-suited to address the research question and therefore helps to overcome several shortcomings of previous studies. Apart from offering important insights for the German case, the analysis of German secondary school students is also of strategic value, as in the highly stratified German education system the effects are expected to be on the low side compared to other countries.

4. Data and variables

We use the first three waves from Starting Cohort 4 of the German National Educational Panel Study (NEPS) for the empirical analyses.⁶ In this starting cohort, ninth graders at regular schools were representatively selected via stratified cluster sampling. This means that, in a first step, schools were sampled and, in a second step, all students of one or two ninth-grade school classes were selected (Skopeket, Pink & Bela, 2013).⁷ In Germany, most of the ninth graders are 15 years old. Wave 1 was conducted at the beginning of the 2010/11 school year (fall 2010). In this wave, students were surveyed and several achievement tests were conducted at the beginning of grade nine. In addition, the parent who is mainly responsible for educational matters regarding the target children (mostly mothers) was questioned in wave 1. Wave 2 was conducted at the end of grade nine (spring 2011) and wave 3 in grade ten (spring 2012). In the last two waves, only the students were interviewed again. The NEPS data is perfectly suited for the analysis of the research questions addressed in this paper since it is representative, longitudinal, has a high number of cases, and allows specific empirical in-depth analyses to be conducted, in which interpersonal influence can be separated from important other confounding influences. Furthermore, the NEPS data entails refined information on many important aspects, including suitable measures for interpersonal influence. In detail, the used variables from the questionnaires are as follows.

In order to measure the educational expectations of the students, they were asked about their opinion on which school leaving qualification they might actually obtain. Answer categories were "leaving school without graduating", "a lower school leaving certificate", "an intermediate school leaving certificate", or "a university entrance qualification (Abitur)". The students answered this question in wave 1 as well as in wave 3. Leaving school without any qualification does not seem to be an option for the students (only 0.2% of the sample chose this answer category). We dichotomize the answer categories by differentiating between Abitur on the one hand and lower or intermediate school leaving qualification on the other; this is because the Abitur differs considerably from the other two with respect to performance requirements as well as years of schooling until graduation, and the Abitur is the only school leaving qualification that allows students to directly enroll at a university. In order to investigate the influence of parents and friends, we use variables which are more suitable to capture interpersonal influences on educational expectations than the information Buchmann and Dalton (2002) had available in the TIMMS data. From a theoretical point of view, it seems reasonable that particularly the educational aspirations and plans of friends and parents have an influence on students' expectations. With regard to the friends, we therefore use a variable which indicates how many people from the circle of friends of the adolescents intend to obtain the Abitur on a scale from one to seven (1 = none, 2 = almost none, 3 = less than half, 4 = about half, 5 = more than half, 6 = almost all, 7 = all). This information was gathered in the student questionnaires in wave 1 and wave 3. To measure parents' aspirations, two variables from wave 1 can be used: one from the student questionnaire and one from the parent questionnaire. The students indicated which highest school leaving qualification their parents would like them to obtain. We differentiate between Abitur and the other answer categories (lower school leaving qualification, intermediate school leaving qualification, parents have no opinion about this). Additionally, the parents were asked what kind of professional training their child should receive. We distinguish between studying at a university (of applied sciences) and the other answer categories (apprenticeship, vocational training, no training). Since this is the only information which was gathered exclusively from the parent questionnaire and a substantial amount of parents did not participate in the study, including this information reduces the sample size by about 35 percent. Despite the strong reduction of the sample size, the substantial results for the influence of parents and friends remain the same, no matter which measure of parents' aspirations is used in the analyses. Therefore, only the results for the measure from the student questionnaire are shown in the main text (results for models using the parents' educational aspirations for university from the parent questionnaire are shown in Tables A3a and A4a in the Appendix A). It should be noted that the variables used are similar to the measures for friends' and parents' influence in the original Wisconsin study (Sewell et al., 1969). The wording of the dependent and key independent variables is shown in Table A1 in the Appendix A.

In the multivariate analyses, it is possible to control for various relevant variables that are known to potentially affect educational expectations of students. First of all, we have detailed information about the social background of the students. We can consider the number of books in the household, the highest educational attainment of the parents and the highest occupational status (ISEI-08) of the parents.⁸ An additional variable indicates whether the child lives in a single-parent household. In addition, persons with and without migration background can be distinguished. Students are defined as having a migration background if they themselves, at least one of their parents, or at least two of their grandparents were born abroad. Furthermore, students' sex and year of birth can be taken into account. Finally, there is exceptionally refined information on school achievement in the NEPS data. With regard to the school form attended, we differentiate between lower secondary schools, intermediate secondary schools, and Gymnasium. In a fourth category, all students attending a comprehensive school or a school with several educational programs are combined. Moreover, the grades for mathematics and German from the previous school report card and performance in six different performance tests (mathematics, sciences, information and communication technologies (ICT), spelling, reading rate, and reading comprehension) are available in order to measure

⁶ This paper uses data from the National Educational Panel Study (NEPS): Starting Cohort 4–9th Grade, <http://dx.doi.org/10.5157/NEPS:SC4:4.0.0> From 2008 to 2013, NEPS data were collected as part of the Framework Programme for the Promotion of Empirical Educational Research funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, the NEPS survey is carried out by the Leibniz Institute for Educational Trajectories (LIfBi) at the University of Bamberg in cooperation with a nationwide network.

⁷ We excluded the subsample of students attending special needs schools from our analyses since they were not asked all relevant questions and received different achievement tests.

⁸ In order to measure parents' education and occupation, we use information from the parent questionnaire. If no information from the parents is available, information from the adolescents is used in addition. If there is only information on one parent available, this information is used.

school achievements. The achievement tests were specifically designed to enable a systematic comparison of students in different educational tracks (Weinert et al., 2011). Scores in the achievement tests are standardized and grades are redefined in order for higher values to signify better school grades. All control variables were surveyed in wave 1 except for reading comprehension, which was gathered in wave 2. Grades in mathematics and German were not only surveyed in wave 1 but also in wave 3.

5. Strategy of analysis

We start the empirical part of the paper by running stepwise logistic regressions of students' educational expectations in wave 1 on friends' and parents' plans and aspirations in wave 1. In contrast to previous research, we control for an exceptionally high amount of relevant factors at the individual level; yet, we cannot conclude from these analyses whether interpersonal influences are indeed at work at secondary level I in Germany.

The most important reason for this is the problem of omitted variable bias. While this is a general problem of empirical research, it might be especially pronounced for the present research question since the aspirations and expectations of students, friends, and parents can be influenced by the same factors, and friends' and parents' aspirations can be proxies for important omitted factors (Hanushek, Kain, Markman, & Rivkin, 2003). The central factors which could bias the results if not adequately controlled for probably are—on the individual level—the performance of the students as well as their social background and—on the contextual level—school characteristics such as school climate, average performance, or average level of educational expectation. This is because these factors might not only affect students' expectations but also the aspirations of the parents for their child, and since schoolmates tend to be part of students' circle of friends, friends' plans can be influenced by these aspects, too. In relation to the friends, there is an additional aspect that might lead to an overestimation of interpersonal influence. This is due to the fact that correlations between the plans of friends and the expectations of students may arise in cross-sectional analyses not only due to interpersonal influence but also due to the tendency for homophily in the development and maintenance of friendships (Mouw, 2006). It might therefore also be possible that it is not the peer group who has a causal effect on the expectations, but rather that certain individual and context related characteristics have a causal influence on the composition of students' peer group. Fortunately, we do not have this selection problem for the parents since you cannot choose your children or your parents.

Due to the aforementioned problems with interpreting coefficients in terms of interpersonal influences, additional analyses are carried out to exclude as many biasing factors at the individual and contextual level as possible. Although the level of detail of the control variables in relation to the individual level is exceptional, the school context might not be perfectly measured by a single indicator that gives information about the type of secondary school attended. In fact, school climate, equipment, teacher quality, average performance level, etc. can be quite different between schools even within the same schooltype. Therefore, it is important to control for these differences. This could be done by including variables that indicate these factors at school level. However, the available information at school level is limited, and even by using a multitude of variables it would not be possible to control for all relevant differences between schools. We thus pursue a different strategy in which we take advantage of the stratified sampling design of the NEPS data. Since students are clustered within schools, we can control for all school characteristics by comparing only differences within schools. We can technically achieve this by running fixed-effects logistic regressions using the school identifier as panel variable. Using this analysis strategy, school-constant unobserved heterogeneity no longer biases our results. Since the chronological order is unclear in cross-sectional analyses, we also run all the aforementioned analyses using the expectations of the students in wave 3 as dependent variable. This ensures that the dependent variable is measured at a later point in time (grade 10) than the independent variables (grade 9). Substantive conclusions remain unchanged (results are shown in Tables A3a and A4a in the Appendix A).

Since both students' expectations and friends' plans were measured in grade nine and in grade ten, it is additionally possible to use the panel structure of the data for an analysis of friends' influence by running student fixed-effects logistic panel regressions. These models give us an estimation of friends' influence that is not biased by any time-constant variable—including unobserved ones—because the fixed-effects logistic analyses infer the causal effect from within-person variation only. As a result, the models only contain the students who changed their expectation between grade 9 and grade 10, which leaves us with 1816 students.⁹ This is not an arbitrary but indispensable reduction of the sample, since students who do not exhibit such a change do not provide us with information that can be used to estimate regression effects. While it is not easily possible to generalize the results in order to cover the students who did not change their expectations, in return we obtain estimates that are not biased by any time-constant unobserved heterogeneity for those who changed their expectation (Allison, 2009; Brüderl & Ludwig, 2015; Mouw, 2006). Despite this big advantage over cross-sectional analyses, reverse causality could still be an issue in these models, and the estimates could still be biased by factors that change over time. Fortunately, the data allows us to control for important time-varying factors at the individual level (grades in mathematics and German) as well as at the school level (average grades in mathematics and German). To derive information at the school level, averages among schoolmates of the students attending the same grade level in the same school were calculated (i.e., students' own grades are excluded). Additionally, we include time varying information on the average educational expectations at the school level, which provides us with further information about interpersonal influences on students' expectations. An advantage of this measure is that the information is derived directly from responses given by the schoolmates and that students cannot influence the change in the composition of their schoolmates.

Due to a greater transparency concerning the number of cases with full information in the models and an easier replicability of the analyses, in all empirical models presented in the main text missing data is dealt with by using listwise deletion.¹⁰ This leaves us with 9303 students with valid values for all of the variables employed in the cross-sectional analyses for wave 1 out of 14,540 students in

⁹ This also excludes students with missing values on the expectations in either grade 9 or grade 10. Missing values in grade 10 are predominantly due to panel attrition and the fact that those who left school were not asked about their expectations in wave 3. Of the students with valid information in both grades, 4 per cent decreased their expectations and 14 per cent increased their expectations from grade 9 to grade 10. Obviously, having more than two measurement points would be favorable since this would give us more observations and it would enhance the probability that single individuals actually change their expectations and therefore are not excluded from the analyses

¹⁰ For an overview of the number of students with information on the single variables, see Table A2 in the Appendix A.

regular schools who participated. With regard to the analyses that additionally use information from wave 3, we have full information for 7426 students. For the fixed-effects logistic panel regressions, our final analyses sample consists of 1623 students, who all visited the same school in grade 9 and grade 10.¹¹ Like in many other studies, this is a not negligible share of missing information which could bias the results. Therefore, we

Table 1
Distribution of dependent and key independent variables in grade nine.

Variables	Categories or Min–Max	Average (SD) or percent	No.
Students' expectation Abitur	Abitur	44.95	4182
Friends	Not Abitur	55.05	5121
Proportion of friends intending to obtain the Abitur	Min 1–Max 7	4.23 (1.69)	9303
Parents	Abitur	60.11	5592
Parents' aspirations Abitur	Not Abitur	39.89	3711
Parents' aspirations University	University	55.55	3351
	Not University	44.45	2681

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

additional sensitivity analysis in which missing values are multiply imputed. We use the official STATA mi system for multiple imputation and estimation of models with multiply imputed data. 20 data sets are created to reduce the sampling error due to imputations in the analyses (StataCorp, 2013). Design weights and all analysis variables are used for imputation. Following the advice from von Hippel (2007), cases with missing information on the dependent variable are used for the multiple imputation but excluded from the analyses (MID method), since with this procedure usually efficiency is increased and the best estimates can be obtained. Furthermore, design weights are taken into account in these analyses, if possible (results are shown in Tables B3a–B5 in the Appendix A). Since the stata command xtlogit does not allow using design weights in fixed-effects logistic regressions, we additionally run fixed-effects linear probability models, which do not have this restriction. Unlike in fixed-effects logistic regressions, cases without variance at the dependent variable are not excluded in these models (results are shown in Tables C3a–C5 in the Appendix A). Results of key interest are very robust across the different sensitivity analyses and substantive conclusions remain unchanged.

In comparison to previous German and international studies which have examined the impact of interpersonal influences on educational expectations, it can overall be said that an unusually high number of potential confounders can be controlled for in the present models on the basis of the NEPS data. By using different methods of analysis, the robustness of the results can also be checked. If we find consistently significant point estimators in all the analyses, this would be rather strong evidence in favor of interpersonal influences on students' educational expectations at secondary level I in Germany.

6. Results

In Table 1, the distributions of the dependent and key independent variables in the ninth grade are shown for the 9303 students in regular schools with valid values for all variables employed in the cross-sectional analyses. About 45% of the students expect to leave school with the Abitur. This reflects the fact that, today, achieving a university entrance qualification is rather common. This can also be seen when looking at friends' educational plans. With a value around the average rate on a scale from one to seven, the answers of the adolescents indicate that about half of their friends intend to obtain the Abitur. Parents' aspirations for their child's highest secondary school degree also show that, today, the Abitur is regarded as desirable by most parents (about 60%). These high educational aspirations are also reflected in the fact that more than half of the parents desire tertiary education for their child.

The distributions of the control variables are displayed in Table 2. Students in the analysis sample are on average 15 years old, 23% of them have a migration background, 48% are boys, and 42% attend a higher secondary school. Grades in German are slightly better than grades in mathematics (1 = insufficient, 6 = very good). Test scores are standardized with an average of zero and a standard deviation of 1. With regard to family background, we have found that 84% of the students live in two-parent families. For 44 per-

¹¹ To be able to control for the changes over time at the school level, we had to exclude the students who changed school between grade 9 and 10 from the analyses since we do not have measures at the school level for them in grade 10.

Table 2

Distribution of control variables in grade nine.

Variables	Categories or Min–Max	Average (SD) or percent	No.
Male	Min 0–Max 1	0.48 (0.49)	9303
Year of birth	Min 1993–Max 1997	1995.34 (0.68)	9303
Two-parent family	Min 0–Max 1	0.84 (0.36)	9303
Migration background	Min 0–Max 1	0.23 (0.42)	9303
Books in household*	Min 1–Max 6	3.99 (1.43)	9303
Highest qualification parents	Lower sec. degree with apprenticeship or less	18.13	1687
	Intermediate sec. degree (with apprenticeship)	37.96	3531
	At least Abitur	43.91	4085
Highest occupational status parents (ISEI-08)	Min 13.87–Max 88.96	51.93 (20.18)	9303
Type of secondary school attended	Lower sec. school	19.75	1837
	Intermediate sec. school	21.58	2008
	Gymnasium	42.00	3907
	Other sec. school	16.67	1551
Grade German	Min 1–Max 6	4.18 (0.82)	9303
Grade mathematics	Min 1–Max 6	4.07 (1.02)	9303
Std. test score ICT	Min –3.79 to Max 4.29	0.00 (1.00)	9303
Std. test score sciences	Min –2.83 to Max 5.20	0.00 (1.00)	9303
Std. test score reading rate	Min –4.16 to Max 1.90	0.00 (1.00)	9303
Std. test score mathematics	Min –3.04 to Max 3.57	0.00 (1.00)	9303
Std. test score spelling	Min –4.90 to Max 2.84	0.00 (1.00)	9303
Std. test score reading comprehension	Min –3.40 to Max 2.55	0.00 (1.00)	9303

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

* 1 = 0–10, 2 = 11–25, 3 = 26–100, 4 = 101–200, 5 = 201–500, 6 = more than 500 books.

Table 3

Average marginal effects for the logistic regressions of students' educational expectations in wave 1 on friends' and parents' plans and aspirations in wave 1.

	Model 1	Model 2	Model 3
Proportion of friends intending to obtain the Abitur	0.083** (0.002)	0.067** (0.003)	0.034** (0.003)
Parents' aspirations Abitur	0.360** (0.008)	0.310** (0.008)	0.158** (0.009)
Highest qualification parents (Ref: Lower sec. degree with apprenticeship or less)		0.033** (0.012)	0.002 (0.011)
	Intermediate sec. degree (with apprenticeship)		0.067** (0.012)
At least Abitur		0.001** (0.000)	0.000 (0.000)
Highest occupational status parents (ISEI-08)		0.031** (0.003)	0.011** (0.003)
Books in household		–0.012 (0.010)	0.035** (0.008)
Migration background		0.021* (0.010)	0.003 (0.009)
Two-parent family		0.019* (0.008)	0.020* (0.008)
Male		0.037** (0.006)	0.003 (0.005)
Year of birth			0.019** (0.005)
Test score mathematics			–0.004 (0.005)
Test score ICT			0.031** (0.005)
Test score sciences			0.013** (0.004)
Test score reading rate			–0.005 (0.005)
Test score spelling			0.012** (0.005)
Test score reading comprehension			

Type of secondary school attended (Ref: Gymnasium) Lower sec. school			(0.005) -0.255**
Other sec. school			(0.027) -0.114**
Intermediate sec. school			(0.011) -0.180**
Grade German			(0.009) 0.041**
Grade mathematics			(0.005) 0.047**
McFadden's pseudo-R2	0.419	0.451	0.574
BIC	7450	7113	5642
Number of observations	9303	9303	9303

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Robust standard errors in brackets.

cent, one or both of the parents have achieved at least the Abitur and the highest occupational status of the parents has an average ISEI-08 score of 52. Comparing the information on the highest educational qualification of the parents and on the type of secondary school attended with the expectations of the students indicates that students' assessment of their chances to reach the Abitur are on average not overly optimistic. This impression is further substantiated by the fact that the share of students who expect to leave school with the Abitur is very similar to the actual share of young adults with university entrance qualifications in Germany (Brugger & Wolters, 2012).

Table 3 reports average marginal effects from cross-sectional logistic regression models of students' educational expectations on friends' and parents' plans and aspirations using robust standard errors to take the clustering of students within schools into account. Average marginal effects have the advantage that they allow for an intuitive interpretation and, in contrast to the logit coefficients and odds ratios, are not distorted by uncorrelated unobserved heterogeneity. This allows a comparison of the effects of parents and friends between models that are built up incrementally (Best & Wolf, 2015).

We run regressions without any control variables in model 1 and add family background, sex, and year of birth in model 2. Model 3 additionally contains all measures on school achievement. This stepwise procedure informs us whether controlling for the family background and/or previous educational achievement substantially reduces interpersonal influences. In model 1, we find substantive and statistically highly significant correlations between the plans and aspirations of friends and parents with students' expectations. Students whose parents would like them to obtain the Abitur have a 36 percentage points higher probability of believing that they will actually obtain the Abitur when they leave school compared to students whose parents do not aspire to the Abitur for them. A one-unit increase on the seven-point scale indicating friends' plans increases the probability that students expect to achieve the Abitur by 8 percentage points. Effect sizes are only slightly diminished when including family background, sex, and year of birth in model 2. Most control variables are significant and point in the expected direction. Students with a high social background have higher expectations. The lower value of the BIC in model 3 indicates an even better model fit than in model 2, and McFadden's pseudo-R2 coefficient has a very high

Table 4

Odds ratios for school fixed-effects logistic models of students' educational expectations in wave 1 on friends' and parents' educational plans and aspirations in wave 1.

	Model 1	Model 2	Model 3
Proportion of friends intending to obtain the Abitur	1.454** (0.039)	1.407** (0.039)	1.369** (0.040)
Parents' aspirations Abitur	6.143** (0.567)	5.637** (0.532)	4.736** (0.483)
Highest qualification parents (Ref: Lower sec. degree with apprenticeship or less)			
Intermediate sec. degree (with apprenticeship)		0.994 (0.115)	1.016 (0.126)
At least Abitur		1.233+ (0.153)	1.216 (0.162)
Highest occupational status parents (ISEI-08)		1.001 (0.002)	0.999 (0.002)
Books in household		1.290** (0.038)	1.195** (0.038)
Migration background		1.033 (0.092)	1.324** (0.129)
Two-parent family		1.131 (0.113)	1.044 (0.112)
Male		1.273** (0.091)	1.284** (0.112)

Year of birth		1.175** (0.064)	1.026 (0.060)
Test score mathematics			1.234** (0.079)
Test score ICT			0.924 (0.055)
Test score sciences			1.385** (0.087)
Test score reading rate			1.119* (0.049)
Test score spelling			0.988 (0.057)
Test score reading comprehension			1.154* (0.065)
Grade German			1.787** (0.104)
Grade mathematics			1.721** (0.078)
Chi-square	724	865	1511
Number of observations	7481	7481	7481
Number of groups	351	351	351

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Standard errors in brackets.

value of 0.57. Model 3 shows that effect sizes of family background and interpersonal influences are substantially reduced when indicators of educational achievement are controlled, whereby the type of secondary school attended has the highest explanatory power. This is clearly in line with the argument of Buchmann and Dalton (2002) that in highly stratified education systems the secondary school type attended strongly determines students' expectations. However, interpersonal influences remain statistically and substantively highly significant although for both parents' and friends' influence average marginal effects are about 60% smaller in model 3 than in model 1. For example, comparing standardized coefficients in model 3 shows that friends' influence is even somewhat stronger than the effects of German grades. This indicates that there still remains enough room for interpersonal influences on the educational expectations of students despite the importance of secondary school types.

Table 4 presents results from school fixed-effects logistic models. These models compare only differences within schools, whereby school-constant unobserved heterogeneity no longer biases our results. Important potentially biasing factors at the contextual level are thus ruled out. The same control variables at the individual level as in Table 3 are included in the models, except for the type of secondary school attended. Results from these fixed-effects logistic models cannot easily be compared to models from Table 3 since the analyses sample is not the same. This is due to the fact that cases in which all students in the school have the same educational expectation do not contribute any information to the estimation of regression effects. In addition, the interpretation of effects on probabilities is rather problematic in fixed-effects logistic models, which is why we show odds ratios (Brüderl, 2010). Fortunately, we are not primarily interested in a comparison with Table 3 or exact point estimates, but our aim is to find out whether interpersonal influences are significant in statistical and substantive terms, even after controlling for as many biasing factors at the individual and context level as possible. Such an interpretation of the results is straightforwardly possible.

Table 4 shows that interpersonal influences are of substantive size and statistically significant at the 1-percent level also in school fixed-effects logistic regressions. For example, the odds ratios for parents' aspirations in model 3 indicate that the odds of expecting to obtain the Abitur is about 4.7 times higher for students whose parents aspire for them to achieve the Abitur than for students whose parents do not have such aspirations for them, even after controlling for important factors at the individual and at the school level. Moreover, the odds ratio of 1.36 for the proportion of friends intending to obtain the Abitur are of a substantive size when taking into account that the proportion of friends is measured on a seven-point scale and that, once again, standardized coefficients are somewhat higher than those for German grades.

In Table 5, results from fixed-effects logistic panel regressions are shown (the distribution of the variables of these models are shown in Table A5 in the Appendix A). This is a clear improvement

	Model 1	Model 2
Proportion of friends intending to obtain the Abitur	1.228** (0.050)	1.184** (0.050)
Grade German (individual level)		1.377** (0.112)
Grade mathematics (individual level)		1.433** (0.102)
Average expectations (school level)		2.725+ (1.561)
Average grades German (school level)		1.069 (0.294)
Average grades mathematics (school level)		0.800 (0.180)
Chi-square	695	753
Number of persons	1629	1629
Number of observations	3258	3258

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Standard errors in brackets. In all models a period dummy is included.

over cross-sectional models because time-constant unobserved heterogeneity is no longer a problem in fixed-effects panel models (Mouw, 2006). Again, substantial results recur. In both models of Table 5, friends' influence is statistically significant at the 1-percent level. Taking into account that all time-constant and several important time-varying variables are controlled, odds ratios of about 1.2 for a one-unit change on a seven-point scale suggest a substantive effect. This interpretation is again substantiated if we compare the influence of friends with the impact of grades on students' expectations. A one standard deviation change in the proportion of friends intending to obtain the Abitur changes the odds of students having an educational expectation to achieve the Abitur to a similar extent as a one standard deviation change in German grades. Our assumption that interpersonal influences exist even in the highly stratified German education system is additionally supported by the fact that average expectations of schoolmates show substantive effects which are significant at the 10-percent level¹² respectively at the 5-percent level if not including the proportion of friends intending to obtain the Abitur in the model.

7. Summary

In accordance with our hypotheses, substantial influences of parents' educational aspirations for their child and friends' educational plans on the educational expectations of secondary school students in Germany have become apparent across all analyses. Owing to the various strategies of analysis, it was possible to take into account a higher number of relevant factors that might distort the results than was the case in previous studies dealing with the influence of significant others on the educational expectations of secondary school students in Germany. Therefore, this finding is particularly important.

That said, the analyses in this paper also have some limitations which shall not go unmentioned. With regard to friends, there might be connections between their plans and students' expectations due to the homophily tendencies in friendship choices. However, we were able to reduce the confounding effects of homophily by considering many relevant control variables and by running fixed-effects regressions. In addition, we also find significant influences of parents and schoolmates although we do not have a selection problem for these interpersonal relationships, since students can neither choose their parents nor can they influence the change in the composition of their schoolmates.

Another issue is that the educational plans of friends were—as in almost all previous studies—captured only through the subjective perceptions of the students regarding the prevailing educational plans in their group of friends. On the one hand, it can be argued that students are more likely to be influenced by their perception of their friends' attitudes than by the actual attitudes of their friends. On the other hand, it cannot be ruled out that part of the observed connections is based on a projection of one's own expectations on one's friends' plans and not on the effectiveness of social influences (Feliciano, 2006; Stocké, 2013). Since results for the influence of parents are substantively and statistically highly significant regardless of whether students' perception of their parents' aspirations was used or whether the parents indicated their aspirations themselves, we are optimistic that possible biases are not substantial. This optimism is further strengthened by the fact that the change in the expectations of schoolmates also shows substantive effects although this information was derived directly from responses given by the schoolmates.

A last point that has to be considered is that it might not be possible to be completely sure about the causal direction of the interpersonal influence even with our refined analyses. The effects might be due to friends and parents affecting students' expectations or due to students affecting friends and parents. However, it seems plausible to assume that the circle of friends has a stronger effect on the students than vice versa, because the circle consists of several persons, while the student is only a single person. However, even if the direction of the effects was reversed, this would not change the

interpretation of the results since it would still depict influences of friends on students (as most friends of a student are also students themselves, it does not matter if they influence the student or the student influences them; all that matters is that there are interpersonal influences between them). With respect to the parents, it can be assumed that they have a stronger effect on their children's expectations than vice versa, since parents have raised their children and have constantly exerted influence on them. However, it has to be taken into

¹² In analyses with multiply imputed data, schoolmate effects are even significant in full models at the 5-percent level (fixed-effects logistic panel regressions, see Table B5) or at the 1-percent level (fixed-effects linear probability panel regressions, see Table C5).

account that the extent of the effects on students might be somewhat overestimated. Due to the overall strong effect sizes, it seems likely, however, that a substantively significant interpersonal influence on students' expectations exists.

Despite the above limitations, we were able to rule out an exceptionally large number of competing explanatory factors through the different strategies of analysis and effects are very robust across the various analyses. Therefore, we are optimistic that the effects found do in fact reflect substantial interpersonal influences on students' expectations and are not merely spurious relationships. This is the case particularly because the results are similar for parents and friends despite the analyses being subject to varying advantages and disadvantages, as has just been described. In comparison to previous empirical studies it can therefore be concluded that rather convincing evidence has been provided for the assumption that friends and parents do in fact influence the educational expectations of secondary school students in Germany.

8. Conclusion and discussion

The demonstration of robust interpersonal influences in Germany at the end of secondary level I is particularly important because previous empirical results and theoretical arguments have cast doubt on the existence of substantive influences of parents and friends on students' expectations in highly stratified education systems after tracking has taken place. Since Germany is a prime example of a highly stratified education system, it seems fair to assume that our results can be transferred to other countries, too. In less stratified education systems, the interpersonal influences on the expectations of secondary school students should be even more pronounced. This means that the present results are expected to be conservative estimates of the effect sizes, compared to other countries. Germany therefore is a strategic test case, and the results have important implications also for international research.

In Germany, the type of school attended and the school grades at the end of secondary level I strongly determine the transition to the upper secondary level which leads to the Abitur and therefore also the expectations of the students to leave school with the Abitur. In such an institutional context, educational expectations are rather concrete than abstract and there is little room for unrealistically high expectations. This means that educational expectations should be less inflated in Germany than in the case of education systems with low stratification, such as in the US (Park, Wells, & Bills, 2015). In fact, the percentage of students who expect to obtain the Abitur is below 50% and very similar to the actual share of young adults with university entrance qualifications in Germany (Brugger & Wolters, 2012). Nevertheless, interpersonal influences are still at work. This indicates that programs which aim at increasing the educational expectations of students ought to consider the social environment of students also in highly stratified education systems. While our measures for interpersonal influences rather highlight the role of parents and friends as models and definers, parents' aspirations and friends' plans might also indicate (potential) access to information and resources. Hence, we can only speculate which of the mechanisms is responsible for the interpersonal influences on the educational expectations of German secondary school students, but we believe that it is most likely a combination of the outlined reasons. Previous findings on the influence of social contacts on the educational expectations of mothers for their children also point in this direction (Roth & Salikutluk 2012). Future research should address this issue further and use more refined measures that provide insights into the underlying mechanisms of interpersonal influences. In this context, it seems also worthwhile to investigate possible gender and ethnic differences.

Previous research indicates that friends or peers might affect the educational success of students not only by influencing their educational expectations but also by influencing their educational performance and educational transitions (Jonsson & Mood, 2008). Therefore, we see another fruitful future endeavor in simultaneously analyzing the influence of friends on educational performance, educational expectations, educational transitions, and on the final educational achievement in a longitudinal perspective. This might be interesting not only for friends' influence but also for parents' influence since results from a current study suggest that, while high aspirations of parents for their children in general have a positive effect on performance, excessive parental aspirations can be detrimental (Murayama, Pekrun, Suzuki, Marsh, & Lichtenfeld, 2015). In a few years, such analyses will be possible for the sample used in this study. This could provide deeper insights into the interplay between interpersonal influences, educational performance, educational expectations, and eventual educational outcomes.

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Appendix A.

Table A1

Wording and answer categories of key dependent and independent variables.

Variables	Wording	Answer categories
Students' expectation Abitur	If you consider everything you know now: What qualification will you actually obtain when you leave school?	(0) Leaving school without graduating (0) Leaving certificate from the Hauptschule (0) Leaving certificate from the Realschule (1) Abitur (university entrance qualification)
Proportion of friends intending to obtain the Abitur	Now we're going to talk about your friends. By 'friends' we mean everybody that you are friends with, whether they attend your school or not. How many of your friends plan to take the Abitur?	(1) None of them (2) Almost none of them (3) Less than half of them (4) Approximately half of them (5) Over half of them (6) Almost all of them (7) All of them
Parents' aspirations Abitur	What is the highest school leaving qualification your parents would like you to obtain?	(0) Junior high school diploma (0) Intermediate high school diploma/high school level I qualification (1) Abitur (university entrance qualification)
Parents' aspirations University (Parent questionnaire)	If it were up to you, what kind of training should <Name of the target child> receive?	(0) My parents have no opinion about this. (0) In-firm training or apprenticeship (0) Full-time school-based vocational training (1) Studies at a university of applied sciences or university (0) No training at all

Table A2

Overview of the number of students with information on the single variables.

Variables	No.
Students' expectation Abitur (wave 1)	13,819
Students' expectation Abitur (wave 3)	10,826
Proportion of friends intending to obtain the Abitur (wave 1)	13,689
Proportion of friends intending to obtain the Abitur (wave 3)	10,833
Parents' aspirations Abitur	13,757
Parents' aspirations University	7753
Male	14,540
Year of birth	14,540
Two-parent family	13,787
Migration background	14,510
Books in household	14,212
Highest qualification parents	12,751
Highest occupational status parents (ISEI-08)	12,747
Type of secondary school attended	14,540
Grade German (wave 1)	13,891
Grade German (wave 3)	10,771
Grade mathematics (wave 1)	13,824
Grade mathematics (wave 3)	10,718
Std. test score ICT	14,486
Std. test score sciences	14,470
Std. test score reading rate	14,524
Std. test score mathematics	14,523
Std. test score spelling	14,500
Std. test score reading comprehension	13,420

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations. Overall, 14,540 students in regular schools participated in wave 1.

Table A3a

Average marginal effects for the logistic regressions of students' educational expectations on friends' educational plans and parents' educational aspirations.

Students' educational expectations measured in:	Wave 1	Wave 1	Wave 3	Wave 3
Proportion of friends intending to obtain an Abitur	0.034** (0.003)	0.039** (0.003)	0.025** (0.003)	0.029** (0.003)
Parents' aspirations Abitur	0.158** (0.009)		0.113** (0.008)	
Parents' aspirations University		0.104** (0.009)		0.120** (0.009)
Highest qualification parents (Ref: Lower sec. degree with apprenticeship or less Intermediate sec. degree (with apprenticeship)	0.002 (0.011)	0.008 (0.014)	0.017 (0.012)	0.019 (0.015)
At least Abitur	0.024* (0.011)	0.037* (0.015)	0.040** (0.013)	0.035* (0.017)
Highest occupational status parents (ISEI-08)	0.000 (0.000)	-0.000 (0.000)	0.001** (0.000)	0.001* (0.000)
Books in household	0.011** (0.003)	0.012** (0.004)	0.013** (0.003)	0.011** (0.004)
Migration background	0.035** (0.008)	0.043** (0.011)	0.048** (0.010)	0.031** (0.013)
Two-parent family	0.003 (0.009)	0.011 (0.012)	-0.029** (0.011)	-0.024+ (0.013)
Male	0.020* (0.008)	0.019+ (0.010)	-0.017+ (0.009)	-0.016 (0.011)
Year of birth	0.003 (0.005)	0.009 (0.006)	0.028** (0.006)	0.023** (0.007)
Test score mathematics	0.019** (0.005)	0.020** (0.006)	0.027** (0.007)	0.023** (0.009)
Test score ICT	-0.004 (0.005)	-0.009 (0.006)	0.008 (0.006)	0.007 (0.007)
Test score sciences	0.031** (0.005)	0.030** (0.006)	0.015* (0.006)	0.011 (0.007)
Test score reading rate	0.013** (0.004)	0.012* (0.005)	0.012** (0.005)	0.011* (0.005)
Test score spelling	-0.005 (0.005)	-0.005 (0.006)	-0.011* (0.006)	0.000 (0.007)
Test score reading comprehension	0.012** (0.005)	0.007 (0.006)	0.030** (0.006)	0.029** (0.007)
Type of secondary school attended (Ref: Gym.) Lower sec. school	-0.255** (0.027)	-0.311** (0.035)	-0.293** (0.022)	-0.295** (0.026)
Other sec. school	-0.114** (0.011)	-0.130** (0.014)	-0.187** (0.016)	-0.151** (0.017)
Intermediate sec. school	-0.180** (0.009)	-0.209** (0.011)	-0.219** (0.012)	-0.206** (0.013)
Grade German	0.041** (0.005)	0.041** (0.007)	0.038** (0.006)	0.029** (0.007)
Grade mathematics	0.047** (0.004)	0.046** (0.005)	0.030** (0.005)	0.027** (0.005)
McFadden's pseudo-R2	0.574	0.565	0.483	0.501
BIC	5642	3817	5287	3406
Number of observations	9303	6032	7426	4916

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Robust standard errors in brackets.

Table A4a

Odds ratios for school fixed-effects logistic models of students' educational expectations on friends' educational plans and parents' educational aspirations.

Students' educational expectations measured in:	Wave 1	Wave 1	Wave 3	Wave 3
Proportion of friends intending to obtain an Abitur	1.369** (0.040)	1.370** (0.052)	1.203** (0.036)	1.257** (0.050)
Parents' aspirations Abitur	4.736** (0.483)		2.294** (0.202)	
Parents' aspirations University		2.679** (0.284)		2.842** (0.306)
Highest qualification parents (Ref: Lower sec. degree with apprenticeship or less)				
Intermediate sec. degree (with apprenticeship)	1.016 (0.126)	0.926 (0.151)	1.162 (0.135)	1.133 (0.179)
At least Abitur	1.216 (0.162)	1.157 (0.202)	1.361* (0.176)	1.152 (0.203)
Highest occupational status parents (ISEI-08)	0.999 (0.002)	0.995 (0.003)	1.004+ (0.002)	1.006* (0.003)
Books in household	1.195** (0.038)	1.213** (0.050)	1.157** (0.037)	1.142** (0.049)
Migration background	1.324** (0.129)	1.350* (0.171)	1.341** (0.134)	1.225 (0.166)
Two-parent family	1.044 (0.112)	1.225 (0.169)	0.773* (0.084)	0.869 (0.128)
Male	1.284** (0.112)	1.216+ (0.133)	0.903 (0.081)	0.885 (0.103)
Year of birth	1.026 (0.060)	1.146+ (0.087)	1.222** (0.074)	1.179* (0.093)
Test score mathematics	1.234** (0.079)	1.248** (0.099)	1.311** (0.090)	1.249** (0.108)
Test score ICT	0.924 (0.055)	0.873+ (0.065)	1.079 (0.068)	1.093 (0.088)
Test score sciences	1.385** (0.087)	1.342** (0.105)	1.125+ (0.074)	1.047 (0.088)
Test score reading rate	1.119* (0.049)	1.126* (0.062)	1.113* (0.051)	1.102+ (0.064)
Test score spelling	0.988 (0.057)	0.994 (0.072)	0.886* (0.053)	0.985 (0.077)
Test score reading comprehension	1.154* (0.065)	1.130+ (0.082)	1.326** (0.079)	1.412** (0.111)
Grade German	1.787** (0.104)	1.695** (0.127)	1.478** (0.088)	1.403** (0.110)
Grade mathematics	1.721** (0.078)	1.736** (0.100)	1.356** (0.064)	1.321** (0.081)
Chi-square	1511	845	753	511
Number of observations	7481	4398	6079	3545
Number of groups	351	293	337	283

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Standard errors in brackets.

Table A5

Distribution of dependent and independent variables in the fixed-effects logistic panel regressions.

	Min–Max	Mean	SD overall	SD between	SD within
Students' own expectation Abitur	0–1	0.50	0.50	0.00	0.50
Prop. of friends intending to obtain Abitur	1–7	4.29	1.46	1.23	0.77
Students' own grades in German	1–6	4.17	0.79	0.66	0.42
Students' own grades in mathematics 1–6	3.99	0.99	0.86	0.49	
School average expectations Abitur	0–1	0.47	0.32	0.31	0.09
School average grades in German	3–5.6	4.16	0.30	0.27	0.12
School average grades in mathematics	3–5.4	4.03	0.32	0.28	0.15

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations. No. of time periods = 2, No. of persons = 1629, No. of observations = 3258.

Table B3a

Average marginal effects for the logistic regressions of students' educational expectations on friends' educational plans and parents' educational aspirations.

Students' educational expectations measured in:	Wave 1	Wave 1	Wave 3
Proportion of friends intending to obtain an Abitur	0.032** (0.002)	0.037** (0.002)	0.025** (0.002)
Parents' aspirations Abitur	0.164** (0.007)		0.132** (0.007)
Parents' aspirations University		0.106** (0.007)	
Highest qualification parents (Ref: Lower sec. degree with apprenticeship or less) Intermediate sec. degree (with apprenticeship)	-0.005 (0.009)	0.006 (0.010)	0.005 (0.011)
At least Abitur	0.019+ (0.011)	0.033** (0.011)	0.031* (0.013)
Highest occupational status parents (ISEI-08)	0.000 (0.000)	-0.000 (0.000)	0.001** (0.000)
Books in household	0.012** (0.002)	0.013** (0.002)	0.011** (0.003)
Migration background	0.033** (0.007)	0.036** (0.007)	0.047** (0.009)
Two-parent family	-0.004 (0.008)	-0.005 (0.008)	-0.026** (0.010)
Male	0.020** (0.006)	0.026** (0.006)	-0.019* (0.008)
Year of birth	0.012** (0.004)	0.013** (0.004)	0.034** (0.005)
Test score mathematics	0.018** (0.004)	0.017** (0.004)	0.029** (0.006)
Test score ICT	-0.002 (0.004)	-0.001 (0.004)	0.012* (0.006)
Test score sciences	0.024** (0.004)	0.027** (0.004)	0.017** (0.006)
Test score reading rate	0.013** (0.003)	0.013** (0.003)	0.017** (0.004)
Test score spelling	-0.000 (0.004)	0.000 (0.004)	-0.005 (0.005)
Test score reading comprehension	0.013** (0.004)	0.012** (0.004)	0.026** (0.005)
Type of secondary school attended (Ref: Gym.) Lower sec. school	-0.306** (0.018)	-0.361** (0.019)	-0.352** (0.022)
Other sec. school	-0.116** (0.013)	-0.187** (0.014)	-0.228** (0.016)
Intermediate sec. school	-0.240** (0.012)	-0.281** (0.013)	-0.274** (0.015)
Grade German	0.045** (0.004)	0.045** (0.004)	0.038** (0.005)
Grade mathematics	0.046** (0.003)	0.045** (0.003)	0.035** (0.004)
Number of observations	13.819	13.819	10.351

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations. Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Standard errors in brackets. Design weights (pweights) are taken into account. Missing data are handled using multiple imputation (MID method).

Table B4a

Odds ratios for school fixed-effects logistic models of students' educational expectations on friends' educational plans and parents' educational aspirations.

Students' educational expectations measured in:	Wave 1	Wave 1	Wave 3	Wave 3
Proportion of friends intending to obtain an Abitur	1.333** (0.032)	1.369** (0.032)	1.173** (0.029)	1.201** (0.030)
Parents' aspirations Abitur	5.018** (0.423)		2.584** (0.189)	
Parents' aspirations University		2.624** (0.240)		2.744** (0.227)
Highest qualification parents (Ref: Lower sec. degree with apprenticeship or less) Intermediate sec. degree (with apprenticeship)	0.995 (0.104)	1.103 (0.117)	1.073 (0.109)	1.187+ (0.123)
At least Abitur	1.186 (0.138)	1.304* (0.149)	1.235+ (0.140)	1.335* (0.152)
Highest occupational status parents (ISEI-08)	0.999	0.999	1.005**	1.004*

	(0.002)	(0.002)	(0.002)	(0.002)
Books in household	1.186**	1.187**	1.128**	1.129**
	(0.031)	(0.031)	(0.030)	(0.031)
Migration background	1.342**	1.337**	1.454**	1.361**
	(0.105)	(0.105)	(0.117)	(0.113)
Two-parent family	1.018	1.026	0.798*	0.787**
	(0.088)	(0.088)	(0.070)	(0.070)
Male	1.209**	1.251**	0.889	0.911
	(0.086)	(0.089)	(0.065)	(0.068)
Year of birth	1.077	1.087+	1.293**	1.280**
	(0.051)	(0.051)	(0.064)	(0.065)
Test score mathematics	1.208**	1.197**	1.316**	1.311**
	(0.063)	(0.062)	(0.074)	(0.074)
Test score ICT	0.978	0.985	1.071	1.073
	(0.050)	(0.049)	(0.057)	(0.058)
Test score sciences	1.301**	1.304**	1.163**	1.156**
	(0.068)	(0.067)	(0.064)	(0.065)
Test score reading rate	1.092*	1.095*	1.094*	1.087*
	(0.040)	(0.040)	(0.042)	(0.042)
Test score spelling	1.052	1.055	0.941	0.967
	(0.052)	(0.052)	(0.048)	(0.050)
Test score reading comprehension	1.112*	1.108*	1.271**	1.246**
	(0.056)	(0.053)	(0.066)	(0.065)
Grade German	1.883**	1.870**	1.488**	1.460**
	(0.090)	(0.090)	(0.073)	(0.074)
Grade mathematics	1.677**	1.645**	1.388**	1.357**
	(0.063)	(0.061)	(0.054)	(0.053)
Number of observations	11,459	11,459	9112	9112
Number of groups	400	400	384	384

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Standard errors in brackets. Missing data are handled using multiple imputation (MID method).

Table B5

Odds ratios for the fixed-effects logistic panel regressions of students' educational expectations on friends' educational plans.

	Full model
Proportion of friends intending to obtain an Abitur	1.178**
	(0.047)
Grade German (individual level)	1.335**
	(0.103)
Grade mathematics (individual level)	1.422**
	(0.095)
Average expectations (school level)	3.695*
	(1.960)
Average grades German (school level)	1.169
	(0.298)
Average grades mathematics (school level)	0.850
	(0.174)
Number of persons	1816
Number of observations	3632

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

In all models, a period dummy is included. Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Standard errors in brackets. Missing data are handled using multiple imputation (MID method).

Table C3a

Coefficients from linear probability regressions of students' educational expectations on friends' educational plans and parents' educational aspirations.

Students' educational expectations measured in:	Wave 1	Wave 1	Wave 3	Wave 3
Proportion of friends intending to obtain an Abitur	0.037**	0.044**	0.029**	0.035**
	(0.002)	(0.002)	(0.003)	(0.003)
Parents' aspirations Abitur	0.221**		0.240**	
	(0.009)		(0.012)	
Parents' aspirations University		0.173**		0.218**
		(0.011)		(0.014)
Highest qualification parents (Ref: Lower sec. degree with apprenticeship or less)				
Intermediate sec. degree (with apprenticeship)	-0.015+	-0.002	0.013	0.030*
	(0.008)	(0.009)	(0.013)	(0.013)
At least Abitur	0.021+	0.036**	0.035*	0.051**
	(0.011)	(0.011)	(0.015)	(0.015)

Highest occupational status parents (ISEI-08)	0.000+	0.000	0.001**	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
Books in household	0.014**	0.014**	0.013**	0.013**
	(0.002)	(0.002)	(0.003)	(0.003)
Migration background	0.021**	0.023**	0.038**	0.032**
	(0.007)	(0.007)	(0.009)	(0.010)
Two-parent family	-0.007	-0.006	-0.027*	-0.028*
	(0.008)	(0.008)	(0.011)	(0.011)
Male	0.017**	0.022**	-0.011	-0.005
	(0.006)	(0.007)	(0.008)	(0.008)
Year of birth	0.014**	0.013**	0.035**	0.033**
	(0.004)	(0.004)	(0.005)	(0.006)
Test score mathematics	0.022**	0.020**	0.020**	0.016**
	(0.004)	(0.004)	(0.005)	(0.005)
Test score ICT	-0.003	-0.001	0.015*	0.015**
	(0.004)	(0.004)	(0.005)	(0.006)
Test score sciences	0.026**	0.028**	0.017**	0.018**
	(0.004)	(0.005)	(0.005)	(0.006)
Test score reading rate	0.014**	0.013**	0.016**	0.015**
	(0.003)	(0.003)	(0.004)	(0.004)
Test score spelling	0.000	0.000	-0.004	-0.002
	(0.004)	(0.004)	(0.005)	(0.005)
Test score reading comprehension	0.016**	0.014**	0.025**	0.023**
	(0.004)	(0.004)	(0.005)	(0.005)
Type of secondary school attended (Ref: Gym.) Lower sec. school	-0.347**	-0.382**	-0.361**	-0.387**
	(0.014)	(0.014)	(0.017)	(0.018)
Other sec. school	-0.277**	-0.283**	-0.246**	-0.237**
	(0.013)	(0.013)	(0.014)	(0.015)
Intermediate sec. school	-0.375**	-0.393**	-0.303**	-0.312**
	(0.012)	(0.012)	(0.014)	(0.014)
Grade German	0.045**	0.044**	0.035**	0.032**
	(0.004)	(0.004)	(0.005)	(0.005)
Grade mathematics	0.047**	0.045**	0.033**	0.029**
	(0.003)	(0.003)	(0.004)	(0.004)
Number of observations	13.819	13.819	10.351	10.351

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Standard errors in brackets. Design weights (pweights) are taken into account.

Missing data are handled using multiple imputation (MID method).

Table C4a

Coefficients from school fixed-effects linear probability regressions of students' educational expectations on friends' educational plans and parents' educational aspirations.

Students' educational expectations measured in:	Wave 1	Wave 1	Wave3	Wave3
Proportion of friends intending to obtain an Abitur	0.028**	0.032**	0.018**	0.022**
	(0.002)	(0.002)	(0.003)	(0.003)
Parents' aspirations Abitur	0.188**		0.194**	
	(0.009)		(0.013)	
Parents' aspirations University		0.144**		0.180**
		(0.011)		(0.014)
Highest qualification parents (Ref: Lower sec. degree with apprenticeship or less)				
Intermediate sec. degree (with apprenticeship)	-0.012	-0.002	0.016	0.028*
	(0.008)	(0.009)	(0.013)	(0.014)
At least Abitur	0.013	0.024*	0.031*	0.043**
	(0.011)	(0.011)	(0.015)	(0.015)
Highest occupational status parents (ISEI-08)	0.000	-0.000	0.001*	0.000+
	(0.000)	(0.000)	(0.000)	(0.000)
Books in household	0.015**	0.015**	0.014**	0.014**
	(0.002)	(0.002)	(0.003)	(0.003)
Migration background	0.010	0.010	0.028**	0.021*
	(0.007)	(0.007)	(0.009)	(0.010)
Two-parent family	-0.006	-0.005	-0.027*	-0.028*
	(0.008)	(0.008)	(0.011)	(0.011)
Male	0.020**	0.023**	-0.002	0.001
	(0.006)	(0.007)	(0.008)	(0.008)
Year of birth	0.011**	0.010*	0.028**	0.026**
	(0.004)	(0.004)	(0.005)	(0.006)
Test score mathematics	0.018**	0.016**	0.016**	0.014*
	(0.004)	(0.005)	(0.005)	(0.005)
Test score ICT	-0.003	-0.002	0.016**	0.017**
	(0.004)	(0.004)	(0.005)	(0.006)

Test score sciences	0.025** (0.004)	0.027** (0.005)	0.015** (0.006)	0.017** (0.006)
Test score reading rate	0.010** (0.003)	0.010** (0.003)	0.012** (0.004)	0.011* (0.004)
Test score spelling	0.000 (0.004)	0.001 (0.004)	-0.010+ (0.006)	-0.007 (0.006)
Test score reading comprehension	0.014** (0.004)	0.012* (0.004)	0.023** (0.005)	0.020** (0.005)
Grade German	0.051** (0.004)	0.051** (0.004)	0.036** (0.005)	0.034** (0.006)
Grade mathematics	0.050* (0.003)	0.048 (0.003)	0.035** (0.004)	0.032** (0.004)
Number of observations	13.819	13.819	10.351	10.351
Number of groups	545	545	508	508

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Standard errors in brackets. Design weights (pweights) are taken into account. Missing data are handled using multiple imputation (MID method).

Table C5

Coefficients for the fixed-effects linear probability panel regressions of students' educational expectations on friends' educational plans.

	Full model
Proportion of friends intending to obtain an Abitur	0.020** (0.003)
Grade German (individual level)	0.031** (0.005)
Grade mathematics (individual level)	0.029** (0.005)
Average expectations (school level)	0.301** (0.043)
Average grades German (school level)	-0.005 (0.018)
Average grades mathematics (school level)	-0.007 (0.014)
Number of persons	10,351
Number of observations	20,702

Source: National Educational Panel Study (NEPS): Starting Cohort 4, author's own calculations.

In all models, a period dummy is included. Significance level: + $p \leq 0.10$, * $p \leq 0.05$, ** $p \leq 0.01$. Standard errors in brackets. Design weights (pweights) are taken into account. Missing data are handled using multiple imputation (MID method).

References

- Allison, P. D. (2009). *Fixed effects regression models*. Thousand Oaks: SAGE.
- Becker, B., & Gresch, C. (2016). Bildungsaspirationen in Familien mit Migrationshintergrund. In C. Diehl, C. Hunkler, & C. Kristen (Eds.), *Ethnische Ungleichheiten im Bildungsverlauf: Mechanismen, Befunde, Debatten* (pp. 73–115). Wiesbaden: Springer VS.
- Becker, B. (2010). Bildungsaspirationen von Migranten – Determinanten und Umsetzung in Bildungsergebnisse. In *MZES Working Papers* (Vol. 137). Mannheim: Mannheimer Zentrum für Europäische Sozialforschung.
- Best, H., & Wolf, C. (2015). Logistic regression. In H. Best, & C. Wolf (Eds.), *The Sage handbook of regression analysis and causal inference* (pp. 153–171). Los Angeles: SAGE.
- Blau, P. M., & Duncan, O. D. (1967). *The American occupational structure*. New York: Wiley.
- Blossfeld, H.-P., Roßbach, H.-G., & von Maurice, J. (2011). Education as a lifelong process: The German National Educational Panel Study (NEPS). *Zeitschrift für Erziehungswissenschaft: Sonderheft*, 14.
- Bourdieu, P. (1977). Cultural reproduction and social reproduction. In J. Karabel, & A. H. Halsey (Eds.), *Power and ideology in education* (pp. 487–511). New York: Oxford University Press.
- Brüderl, J., & Ludwig, V. (2015). Fixed-effects panel regression. In H. Best, & C. Wolf (Eds.), *The Sage handbook of regression analysis and causal inference* (pp. 327–357). Los Angeles: SAGE.
- Brüderl, J. (2010). Kausalanalyse mit Paneldaten. In C. Wolf, & H. Best (Eds.), *Handbuch der sozialwissenschaftlichen Datenanalyse* (pp. 963–994). Wiesbaden: VS Verlag für Sozialwissenschaften.
- Brugger, P., & Wolters, M. (2012). Von der Hochschulreife zum Studienabschluss. In *Statistisches Bundesamt* (Ed.), *Auszug aus Wirtschaft und Statistik* (pp. 655–663). Wiesbaden: Statistisches Bundesamt.
- Buchmann, C., & Dalton, B. (2002). Interpersonal influences and educational aspirations in 12 countries: The importance of institutional context. *Sociology of Education*, 75, 99–122.

- Buchmann, C., & Park, H. (2009). Stratification and the formation of expectations in highly differentiated educational systems. *Research in Social Stratification and Mobility*, 27, 245–267.
- Cheng, S., & Starks, B. (2002). Racial differences in the effects of significant others on students' educational expectations. *Sociology of Education*, 75, 306–327.
- Chenoweth, E., & Galliher, R. V. (2004). Factors influencing college aspirations of rural West Virginia high school students. *Journal of Research in Rural Education*, 19, 1–14.
- Chowdry, H., Crawford, C., & Goodman, A. (2011). The role of attitudes and behaviours in explaining socio-economic differences in attainment at age 16. *Longitudinal and Life Course Studies*, 2, 59–76.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, 95–120.
- Feliciano, C. (2006). Beyond the family: The influence of premigration group status on the educational expectations of immigrants' children. *Sociology of Education*, 79, 281–303.
- Gabay-Egozi, L., Shavit, Y., & Yaish, M. (2015). Gender differences in fields of study: The role of significant others and rational choice motivations. *European Sociological Review*, 31, 284–297.
- Haller, A. O. (1968). On the concept of aspiration. *Rural Sociology*, 33, 484–487.
- Hanushek, E. A., Kain, J. F., Markman, J. M., & Rivkin, S. G. (2003). Does peer ability affect student achievement? *Journal of Applied Econometrics*, 18, 527–544.
- Hillmert, S., & Jacob, M. (2010). Selections and social selectivity on the academic track: A life-course analysis of educational attainment in Germany. *Research in Social Stratification and Mobility*, 28, 59–76.
- Hoening, K., Pollack, R., Schulz, B., & Stocké, V. (2016). Social capital, participation in adult education, and labor market success: Constructing a new instrument. In H.-P. Blossfeld, J. V. Maurice, M. Bayer, & J. Skopek (Eds.), *Methodological issues of longitudinal surveys: The example of the National Educational Panel Study* (pp. 291–312). Wiesbaden: Springer VS.
- Jacob, M., & Tieben, N. (2009). Social selectivity of track mobility in secondary schools: A comparison of intra-secondary transitions in Germany and the Netherlands. *European Societies*, 11, 747–773.
- Jonsson, J. O., & Mood, C. (2008). Choice by contrast in Swedish schools: How peers' achievement affects educational choice. *Social Forces*, 87, 741–765.
- Khattab, N. (2002). Social capital: students' perceptions and educational aspirations among Palestinian students in Israel. *Research in Education*, 68, 77–87.
- Kristen, C., Shavit, Y., Chachashvili-Bolotin, S., Roth, T., & Adler, I. (2014). Achievement differences between immigrant and native fourth graders in Germany and Israel. In R. K. Silbereisen, P. F. Titzmann, & Y. Shavit (Eds.), *The challenges of diaspora migration: Interdisciplinary perspectives on Israel and Germany* (pp. 191–209). Farnham: Ashgate.
- Lin, N. (2006). Social capital. In J. Beckert, & M. Zafirofski (Eds.), *International encyclopedia of economic sociology* (pp. 604–612). London & New York: Routledge.
- Müller, W. (2005). Education and youth integration into European labour markets. *International Journal of Comparative Sociology*, 46, 461–485.
- Morgan, S. L. (1998). Adolescent educational expectations: Rationalized, fantasized, or both? *Rationality and Society*, 10, 131–162.
- Mouw, T. (2006). Estimating the causal effect of social capital: A review of recent research. *Annual Review of Sociology*, 32, 79–102.
- Murayama, K., Pekrun, R., Suzuki, M., Marsh, H. W., & Lichtenfeld, S. (2015). Don't aim too high for your kids: Parental overaspiration undermines students' learning in mathematics. *Journal of Personality and Social Psychology*, <http://dx.doi.org/10.1037/pspp0000079>
- Park, S., Wells, R., & Bills, D. (2015). Changes in educational expectations between 10th and 12th grade across cohorts. *Social Psychology of Education*, 18, 561–583.
- Portes, A., Aparicio, R., Haller, W., & Vickstrom, E. (2010). Moving ahead in Madrid: Aspirations and expectations in the Spanish second generation. *International Migration Review*, 44, 767–801.
- Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24, 1–24.
- Roth, T., & Salikutluk, Z. (2012). Attitudes and expectations: Do attitudes towards education mediate the relationship between social networks and parental expectations? *British Journal of Sociology of Education*, 33, 701–722.
- Roth, T. (2014). *Die Rolle sozialer Netzwerke für den Erfolg von Einheimischen und Migranten im deutschen (Aus-)Bildungssystem*. Aachen: Shaker.
- Salikutluk, Z. (2013). Immigrants' aspiration paradox – Theoretical explanations and determinants of the aspiration gap between native and immigrant students. In *MZES Working Papers (Vol. 150)*. Mannheim: Mannheimer Zentrum für europäische Sozialforschung.
- Salikutluk, Z. (2016). Why do immigrant students aim high? Explaining the aspiration–achievement paradox of immigrants in Germany. *European Sociological Review*, 32, 581–592.
- Schneider, T. (2008). Social inequality in educational participation in the German school system in a longitudinal perspective: Pathways into and out of the most prestigious school track. *European Sociological Review*, 24, 511–526.
- Schuchart, C. (2009). Warum interessieren sich Hauptschülerinnen und Hauptschüler für einen Realschulabschluss? Eine Analyse individueller

- Überzeugungen unter besonderer Beachtung geschlechterspezifischer Differenzen. In J. Baumert, K. Maaz, & U. Trautwein (Eds.), *Bildungsentscheidungen – Zeitschrift für Erziehungswissenschaften – Sonderheft 12* (pp. 373–397). Wiesbaden: VS Verlag für Sozialwissenschaften.
- Sekretariat der Kultusministerkonferenz. (2010). *Übergang von der Grundschule in Schulen des Sekundarbereichs I und Förderung, Beobachtung und Orientierung in den Jahrgangsstufen 5 und 6 (sog. Orientierungsstufe)*. Informationsschrift des Sekretariats der Kultusministerkonferenz, Stand 18.10.2010.
- Sewell, W. H., Haller, A. O., & Portes, A. (1969). The educational and early occupational attainment process. *American Sociological Review*, 34, 82–92.
- Sewell, W. H., Haller, A. O., & Ohlendorf, G. W. (1970). The educational and early occupational attainment process: Replication and revision. *American Sociological Review*, 35, 1014–1027.
- Skopek, J., Pink, S., & Bela, D. (2013). *Starting cohort 4: 9th grade (SC4) SUF Version 1.1.0 Data Manual – National Educational Panel Study (NEPS)*. Bamberg: University of Bamberg.
- StataCorp. (2013). *Stata multiple-imputation reference manual – Release 13*. Texas: Stata Press.
- Stocké, V. (2013). Bildungsaspirationen, soziale Netzwerke und Rationalität. In R. Becker, & A. Schulze (Eds.), *Bildungskontexte* (pp. 269–298). Wiesbaden: Springer VS.
- von Hippel, P. T. (2007). Regression with missing Ys: An improved strategy for analyzing multiply imputed data. *Sociological Methodology*, 37, 83–117.
- Watermann, R., & Maaz, K. (2006). Effekte der Öffnung von Wegen zur Hochschulreife auf die Studienintention am Ende der gymnasialen Oberstufe. *Zeitschrift für Erziehungswissenschaft*, 9, 219–239.
- Weinert, S., Artelt, C., Prenzel, M., Senkbeil, M., Ehmke, T., & Carstensen, C. H. (2011). Development of competencies across the life span. In H.-P. Blossfeld,
- H.-G. Roßbach, & J. V. Maurice (Eds.), *Education as a lifelong process – The German National Educational Panel Study (NEPS) – Zeitschrift für Erziehungswissenschaften Sonderheft 14* (pp. 251–266). Wiesbaden: VS Verlag für Sozialwissenschaften.
- Wells, R. S., Seifert, T. A., Padgett, R. D., Park, S., & Umbach, P. D. (2011). Why do more women than men want to earn a four-year degree? Exploring the effects of gender, social origin, and social capital on educational expectations. *The Journal of Higher Education*, 82, 1–32.
- Woelfel, J., & Haller, A. O. (1971). Significant others: The self-reflexive act and the attitude formation process. *American Sociological Review*, 36, 74–87.