Shadow Education in Germany: Compensatory or Status Attainment Strategy? Findings from the German LifE Study

Steve R. Entrich, Wolfgang Lauterbach

Abstract: In Germany we observe a strong increase in the enrolment in shadow education ('*Nachhilfe*') over the last two decades. To explain this development we draw on social reproduction theories identifying two strategies: (1) families seek competitive advantages for their children to maintain or achieve an advantageous education level (status attainment strategy); and (2) families seek performance improvement for their low performing children in order to meet the high demands in the pursuit of the highest school diploma (compensatory strategy). To test our theoretical ideas, we estimate regression models using data from the 2012 German LifE study. We find that shadow education is primarily used by disadvantaged educational strata to deal with higher demands in school. We conclude that the increased investment in *Nachhilfe* is an unintended but not yet negative outcome of educational expansion and recent educational reforms in Germany.

Keywords: shadow education, private tutoring, *Nachhilfe*, social inequality, Germany

Introduction

Shadow education is well established in East Asian countries and did also expand in many Western countries over the last 20 years (Park, Buchmann, Choi, & Merry, 2016). In Germany, the proportion of 17-year olds who ever received paid *Nachhilfe*[1], has increased from 27 percent in the early 2000 years to 47 percent in the early 2010 years (Hille, Spieß, & Staneva, 2016, p. 116). The market is dominated by 4.500 *Nachhilfe* schools, of which most were founded since 1992 (Birkelbach, Dobischat, & Dobischat, 2017, pp. 59-62). International research highlights three characteristics of shadow education: It is *academic*, therefore excluding all non-academic forms of out-of-school education; it is used as a *supplement* and therefore taking place outside regular school hours; and it is *private*, profit-oriented and therefore fee based (Bray, 2017). Consequently, past international and German research is dominated by the view that shadow education exacerbates social inequality, be-

1 *Nachhilfe* (extra-help) is a broad description for all kinds of supplementary tutoring. We focus our analysis on private, fee-based, commercial *Nachhilfe*, which fits the formal definition of shadow education by Bray (2017). The terms shadow education, private tutoring and *Nachhilfe* are used synonymous.

cause parents with higher socioeconomic status (SES) seem to be in a better position to reap the benefits of private tutoring (Dohmen, 2012; Heyneman, 2011; Hille et al., 2016; Park et al., 2016). Several empirical studies confirmed that high SES students more frequently enrol in private tutoring and use the more cost-intensive lessons leading to higher performance and better educational placement, i.e. entrance to more prestigious schools and universities (e.g. Buchmann, Condron, & Roscigno, 2010; Entrich, 2018; Stevenson & Baker, 1992). Only few studies exist indicating that shadow education is used independent of parental SES and may even reduce social inequality by compensating performance deficits of low SES students (e.g. Entrich, 2018; Luplow & Schneider, 2014; Seiyama & Noguchi, 1984).

Whether *Nachhilfe* reduces the SES achievement gap and therefore social inequality is still "empirically open to research" (Stecher, 2018, p. 144). Against this background, we ask two questions:

1. Why has the demand for shadow education in Germany increased that much?
2. What are the implications of the increased investments in shadow education on social inequality?

We address both questions by outlining two educational developments which affect the demand for *Nachhilfe*: The reform of the German tripartite secondary school system and families' massive pursuit of higher educational attainment. We draw on *social reproduction theories* to show that shadow education can be both, an instrument to counteract all students' low academic performance and a status-specific investment strategy of families serving status maintenance and upgrade motives.

We predict the determinants of shadow education investment through logistic regressions using the 2012 *Pathways from Late Childhood to Adulthood* (LifE) study for Germany (Lauterbach, Fend, & Gläßer, 2016). The LifE study questioned parents and students on all key aspects necessary for this analysis. This allows a reliable analysis of SES-specific *Nachhilfe* investment in Germany.

Theoretical Frame

Institutional Context and Increase in Shadow Education

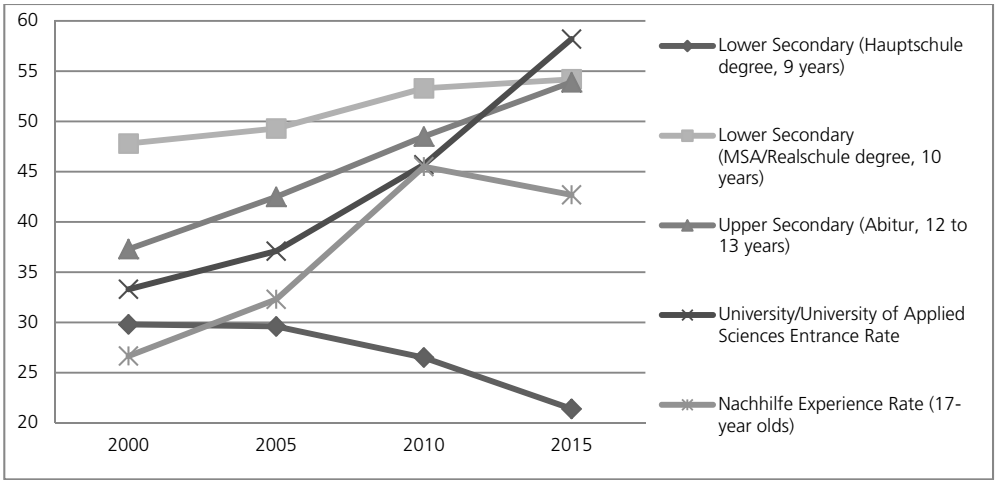
The German educational system has long been criticized for reproducing social inequality through early separation of students into three secondary school types of different length and curriculum: *Hauptschule*, *Realschule* and *Gymnasium*. The *Gymnasium* leads to the *Abitur* (12 or 13 years), the highest secondary school degree, which provides students with the opportunity to enter university. The curricula of the *Real-* and *Hauptschule* are less demanding, leading to lower secondary school degrees after 10 or 9 years of schooling, respectively. Both enable graduates to enter the dual vocational training system (Weiss & Schindler, 2017).

Following the 2002 PISA-shock in Germany, reforms where initiated to increase equality of educational opportunities (Ertl, 2006). The traditional tripartite school system was replaced in 12 out of 16 states by a bipartite school system. *Hauptschule* and *Realschule* were combined to create a comprehensive secondary school type parallel to the *Gymnasium*. From 2005

to 2015 627 of these new secondary schools were established, of which most offer the possibility to achieve the *Abitur*. In 2015 the proportion of all secondary schools providing the upper secondary school program leading to the *Abitur* reached 100 percent in the three federal states Berlin, Bremen and Hamburg, above 90% in Saarland and Schleswig Holstein, and above 70% in Hesse. Only in Bavaria, Lower Saxony and Thuringia, less than 40% of all secondary schools lead to the *Abitur*. But even in the latter federal states, students are formally granted entrance to the *Abitur* track upon achievement of the newly introduced central middle school diploma (*Mittelschulabschluss*, in short MSA) in grade ten (Baumert et al., 2019). Independent of the type of obtained lower secondary degree, whether MSA or traditional degree, all students are allowed to apply at schools which provide the opportunity to achieve the *Abitur* as well (Bildungsberichterstattung, 2016, pp. 74, 257).

As Figure 1 illustrates, a trend towards a bipartite school system with universal access to the upper secondary level is obvious. From 2000 to 2015 the percentage of students achieving the *Abitur* increased massively, from 37.3% to 53.9%. Today, more than every second student achieves the highest school degree and thus the opportunity to directly advance to higher education institutions. Similarly, the percentage of students entering tertiary education has increased from 45.7% in 2010 to 58.2% in 2015. In addition to this formal upgrading of the student population, a significant increase in shadow education enrolment is evident. Between 2000 and 2010 the proportion of 17-year olds with *Nachhilfe* experience rose from 26.7 to 45.5 percent and stayed at a comparable level ever since.

Figure 1. Percentage of Secondary Education Graduates, Entrants to Higher Education and Participation in Paid *Nachhilfe* in Germany (2000-2015)



Notes: Secondary school graduation rates as a proportion of the respective age population of the corresponding year; tertiary education enrolment rates as a proportion of first-year students of the population of the corresponding year of birth; shadow education experience rate based on the item: *"Did you ever obtain paid Nachhilfe? (Yes/No)"* from the GSOEP, showing the weighted mean of 17-year-old participants according to birth cohorts (2000: born 1982-84; 2005: born 1987-89; 2010: 1992-94; 2015: 1997-99).

Sources: Bundesministerium für Bildung und Forschung (Ministry of Education and Research; BMBF, 2018); German Socio-economic Panel Study (GSOEPv36), own calculation.

Because of the structural change from a tripartite to a bipartite school system, with both tracks leading to the highest school degree, the *Abitur* lost its former elitist character. It became the standard aspired school diploma for most families. With the majority of students attaining the *Abitur* (2015: 53.9 %), the competition between students of all strata increased. Today, the grade point average (GPA) defines the relative value of the degree. Only the best GPA ensures entrance to attractive study programs at universities. For ambitious families this must appear as the best way to secure promising future prospects for their children.

As academic achievement has become more important at the secondary school level, investment in *Nachhilfe* became more attractive also. Recent national representative data show that the participation in paid *Nachhilfe* remains at a low level during primary school (from 2% in first grade to 8% in fourth grade). But, following the transition to the secondary school level, enrolment rates double (16% in fifth grade) and continue to increase further reaching 20% on average prior to the lower secondary degree exams in grades nine (*Hauptschulabschluss*) and ten (MSA; Hille et al., 2016, p. 114).[2] Another peak in enrolments occurs prior to the *Abitur* final exams in grades 12 and 13 (Birkelbach et al., 2017, pp. 64-65). Both, MSA and *Abitur* mark major transition points, as they decide whether students can proceed to the next schooling level, i.e. to upper secondary education or university, respectively.

Nachhilfe as Compensatory or Status Attainment Strategy?

To explain the increased enrolment in *Nachhilfe*, we draw on social reproduction theories. *Rational choice theory* (Boudon, 1974) indicates that students from disadvantaged family backgrounds receive less support than students from advantaged backgrounds and therefore should have more reason to participate in *Nachhilfe* for remedial purposes. Shadow education could be used to tackle the academic achievement gap between lower and upper social strata families and reduce inequality in educational attainment. However, status-specific differences in educational aspirations affect cost-benefit considerations of families, making the decision for shadow education another rational investment of parents, reflecting status maintenance motives (Entrich, 2015, 2018; Luplow & Schneider, 2014). The higher the parental social status, the more parents want to avoid status downgrading through investments in education (Breen & Goldthorpe, 1997), including shadow education.

Effectively maintained inequality theory (Lucas, 2001) points out that only by assessing quantitative (or vertical) and qualitative (or horizontal) dimensions of education simultaneously we can illuminate the dynamics of inequality (Lucas & Byrne, 2017). Because in high educated societies students of nearly all social strata have access to the highest formal education (vertical dimension), upper strata families have to gain new competitive advantages in educational attainment to maintain their status, i.e. higher quality education (horizontal dimension; see also Netz & Finger, 2016; Reimer & Pollak, 2010). If more children of all strata gain access to a formerly advantageous school degree (e.g. the *Abitur)*, it is no longer sufficient to simply achieve this diploma to ensure status advantages. High SES parents will

2 Students were asked whether they received paid *Nachhilfe* during the last six months or not.

seek new ways to achieve horizontal advantages, i.e. increase the value of their children's education level (degree) for status attainment.

Consequently, an investment in shadow education can have two major functions related to status attainment: (1) Supporting low performing students to achieve the (new) standard education level, i.e. *compensation* (*vertical* dimension of status motives); and/or (2) increasing students' chances to enter high ranking education or vocational programs through achievement of above average degrees (*horizontal* dimension of status motives). Depending on the performance level and SES of the students participating in shadow education, this investment indicates either status maintenance of higher strata, status upgrade of lower strata, or pure compensatory use for all strata.

In Germany, shadow education was originally designed to support low performing students and has long been a legitimate strategy to counteract learning problems. *Nachhilfe* corresponded with remedial tutoring and was used to increase the chances of reaching a certain education degree (e.g. Dohmen, 2012; Entrich, 2014; Klemm & Hollenbach-Biele, 2016; Stecher & Maschke, 2013). However, examples from different national settings show that shadow education is more frequently used by high SES families to increase the chance of entrance into high ranked schools or universities (e.g. USA: Buchmann et al., 2010; South Korea: Byun, 2014; Japan: Entrich, 2018). This favours the second status motive, leading to horizontal differences in educational attainment.

Recent German studies attribute the increased demand for *Nachhilfe* to a change of investment strategies among families (Dohmen, 2012; Klemm & Hollenbach-Biele, 2016; Koinzer, 2013; Schlösser & Schuhen, 2011; Stecher & Maschke, 2013). Accordingly, high SES parents invest in *Nachhilfe* to ensure that their children maintain an advantaged societal position based on entrance to hierarchically high-ranking educational institutions, i.e. universities or training programs promising high returns. However, up to now it was not empirically tested whether students with good grades attend *Nachhilfe* to maintain their status advantages. Previous research showed that children from high SES families more often enter tertiary education, choose higher ranking universities, and select study programs that promise higher returns. SES-specific differences in the enrolment into qualitatively differently ranked secondary school degree programs were also verified (Reimer & Pollak, 2010; Weiss & Schindler, 2017).

In order to secure an advantageous educational position in relation to other students, *Nachhilfe* can probably be used by well performing students to achieve a better *Abitur* than their peers. If this is the case, these students can increase their chances of gaining access to more prestigious universities, study majors, or training programs. Through this, they will gain higher returns compared to students with only an average or below average *Abitur*.

Based on these considerations, we propose to understand the increased *Nachhilfe* investment in Germany in two ways: Families' intention to maintain or achieve a high or mediocre status through the investment in *Nachhilfe* (status attainment strategy); and the families' demand for remedial *Nachhilfe* in order to meet the high demands in the pursuit of the highest school diploma, i.e. the *Abitur* (compensation strategy). We assume that both strategies are simultaneously pursued by families of all social strata. In order to test which strategy predominates in Germany, hypotheses based on the theoretical discussions are introduced.

Hypotheses

Since status motives are strongly related to parents' SES and aspirations, we first intend to test the following hypothesis:

[H1-1] The higher parents' socioeconomic status and future aspirations for their children, the more likely they invest in paid Nachhilfe to achieve status advantages (status attainment strategy).

Second, based on students' academic performance we assume that students with low performance actually need *Nachhilfe* to achieve a pursued degree (*vertical* dimension), while especially average performers can use *Nachhilfe* to improve the relative worth of their pursued degree (*horizontal* dimension):

[H1-2] The likelihood of obtaining Nachhilfe is highest for low performers (compensatory strategy), but not considerably lower for average performers (status attainment strategy).

Moreover, we expect that students have a higher likelihood to obtain *Nachhilfe* if they enter qualitatively more demanding school tracks, i.e. leading to the *Abitur*:

[H1-3] The higher the quality of the pursued degree, the higher the probability of obtaining Nachhilfe to compensate for the higher requirements attached to this degree (compensatory strategy).

In addition, we expect that the demand for *Nachhilfe* increases when students face major exams towards the end of the lower (MSA) or upper secondary school levels (*Abitur*) from age 15 onwards:

[H1-4] With higher age, students' probability of obtaining Nachhilfe increases (compensatory strategy).

We also expect that students' own aspirations positively influence their likelihood to obtain *Nachhilfe, because* students gain "more influence over the decision for shadow education as they grow older" (Entrich, 2015, pp. 212-213):

[H1-5] The higher students' own post-secondary aspirations, the more likely they are to obtain Nachhilfe (status attainment strategy).

Furthermore, we expect differences in students' likelihood to obtain *Nachhilfe* according to the education level of their parents. We classify parental educational level as high (tertiary education) and mediocre (lower than tertiary). First, we expect that within educational strata other family resources are unequally distributed. Families with more financial resources should be able to afford more *Nachhilfe* than others:

[H2-1] Parents without tertiary education are more likely to invest in Nachhilfe if they can draw on other resources, such as high income, so their children can achieve a higher education level (status upgrade strategy).

We also test the assumption that well-performing students from high SES families use *Nachhilfe* to gain horizontal status advantages:

[H2-2] Children from parents with tertiary education are more likely to obtain Nachhilfe if their grades are not below the average (status maintenance strategy).

We further expect to find differences between educational strata which come with the different requirements concerning vertical and horizontal differences of secondary school degrees and differences in students' status-specific aspirations:

[H2-3] Children from parents without tertiary education are more likely to obtain Nachhilfe if they are enrolled in more demanding degree programs, i.e. the Abitur (compensatory strategy).

[H2-4] Children from parents with tertiary education are more likely to obtain Nachhilfe at a later point in their school life course, i.e. at the upper secondary school level, to improve the relative worth of their degree (status maintenance strategy).

[H2-5] If children from parents without tertiary education aspire to enter university following graduation, they are more likely to obtain Nachhilfe than children from parents with tertiary education (status upgrade strategy).

Through making these differences between educational strata and focusing on students' grades, school background and aspirations, we are able to identify whether *Nachhilfe* remains a compensatory tool or also serves as status attainment strategy (maintenance or upgrade).

Data and Methods

Data: The German LifE Study (1979-2012)

The German LifE study entitled *Pathways from Late Childhood to Adulthood* started as a longitudinal youth study with a representative student sample for West Germany, conducted in urban and rural regions of Hesse. Five annual samples of approximately 2000 children of the birth cohort 1967 were collected from 1979 to 1983. Students were questioned up to five times, their parents were questioned two times. The LifE study continued to accompany the former students and collected data again in 2002 (age ~35) and 2012 (age ~45). In 2012, the sample of the original participants (*N*=1,359) was supplemented by an additional independent sample of their 12- to 17-year old children[3] (*N*=581). In the main survey, the now 45-year olds were asked about their children's education, including out-of-school activities such as *Nachhilfe*. Similar to their parents, the children provided information on their schooling background, leisure activities, and future aspirations. Thus, we are in a position to use direct responses from both cohorts and bring them together for our analysis of *Nachhilfe* determinants. Even though our final analytic sample is small (*N*=449), it allows to make reliable statements about SES-specific *Nachhilfe* investment in former West Germany.

3 Only the first-born child in each family aged 12- to less than 18-years was considered.

Dependent Variable: *Nachhilfe* Participation

In 2012, parents were asked the following questions concerning *Nachhilfe*:

- "Has your child ever received *Nachhilfe* during his/her school life? If yes, how often?"
- "Did you pay for this *Nachhilfe* or was it mainly free of charge?"
- "What prompted you to organize *Nachhilfe* for your child?"

Of the 449 children used in the analysis, 44.5% reported experience with paid *Nachhilfe*, whereas another 8.2% obtained free of charge *Nachhilfe*. The total enrolment rate in paid *Nachhilfe* is thus consistent with the nationally representative data (see Figure 1). Most of the children used *Nachhilfe* "several times" (57.5%), some "rarely" (26%), while 16.6% used it "quite often". Half of all recipients (51.9%) used these lessons to improve their grades, 37.6% pursued *Nachhilfe* to prepare for upcoming tests or exams such as the MSA or *Abitur*. 26.6% wanted to close gaps of knowledge, or practiced new learning strategies. It's unclear whether *Nachhilfe* is used for status maintenance of upper strata or status attainment of lower and middle strata. Such motives are not directly intended and thus obtainable through items asking for the reasons to attend *Nachhilfe*. We need to scrutinize the differences in a statistical model where we differentiate social origin, aspirations, students' grades and schooling background. We recode our dependent variable as follows: (1) paid and (0) unpaid and no *Nachhilfe*.[4]

Explanatory Variables

To test hypotheses [H1-1] and [H2-1], we need appropriate measures reflecting the parental level of education, the economic and social dimensions of social origin, and parents' educational aspirations for their children. We classified parents' education level into two categories: tertiary education (1), and non-tertiary (0). We recoded families' household-net-income into three categories reflecting the relative income position: high income (*1*=more than 150% of average household-net-income), average income (*2*=more than 70 % but less than 150% of average household-net-income), and low income (*3*=less than 70% of average household-net-income; i.e. reference). In addition, we include parental class based on the *European Socioeconomic Classification* (ESeC): The salariat (*1*), the intermediate (*2*), and the working class (*3*, i.e. reference).[5] Finally, we include a dummy variable reflecting parents' post-secondary school aspirations for their children, coded as: targeting a university degree (*1*); or targeting no such degree (*0*).

4 In previous analyses, we carried out multinomial logistic regressions differentiating our dependent variable in paid *Nachhilfe* (1), free-of-charge *Nachhilfe* (2) and no *Nachhilfe* (3; Entrich & Lauterbach, 2016; Entrich & Lauterbach, 2017). We found no substantial differences between those using free-of-charge lessons and those using no *Nachhilfe*. Since the number of students using free-of-charge tutoring is small, the reliability of our models is better realized with the here proposed binary coding of the dependent variable. Further analyses excluding free-of-charge *Nachhilfe* show consistent findings with the results of our analyses in this paper.

5 The ESeC is used to classify European societies into nine categories, ranging from higher professions and management occupations to routine workers. We recoded these nine groups into three broad classes: the salariat (categories 1 and 2), the intermediate (categories 3, 4, 5, and 6), and the working class (categories 7, 8, and 9; for a detailed overview see Wirth & Fischer, 2008).

To approach hypotheses [H1-2] and [H2-2], we include students' grades in the three core subjects in which students most frequently demand *Nachhilfe*: Mathematics, English, and German (Birkelbach et al., 2017, p. 88). Grades in German schools range from *1* (highest) to *6* (lowest), with grades 5 and 6 implying a failure of the student, thus endangering the transfer to the next grade level. To identify performance related motives, we compute a sum score based on students' grades in all three subjects. We classified three performance categories: high GPA (*1*=grades 1, 2), low GPA (*2*=grades 4, 5, 6), and average GPA (*3*=grade 3, i.e. reference).

To approach hypotheses [H1-3/4/5] and [H2-3/4/5], we include a variable which reflects the pursued school degree. Hence, we are able to see whether students pursue *Nachhilfe* more often if they aspire to achieve a higher degree independent of the school type they are enrolled in. We classified two categories: Upper secondary school degree (*Abitur*: *1*); and MSA or other lower secondary school degree (*0*). An additional variable for students' age as a proxy for years of achieved education is included as follows: 15 to 17 years old (*1*); and 12 to 14 years old (*2*). Hence, we can test whether the horizontal or vertical differences at the secondary school level influence *Nachhilfe* investment. Furthermore, students' own educational aspirations are considered similar to their parents' aspirations: aiming to achieve a university degree (*1*); or no such ambition (*0*). Lastly, we control for gender (*1*=male; *0*=female).

Methods

To test our hypotheses, we look at descriptive statistics, before we estimate stepwise logistic regressions predicting students' participation in *Nachhilfe*: In Model 1, we concentrate on the influence of parents' social background on *Nachhilfe* persuasion as proposed in [H1-1]. Model 2 addresses students' performance as proposed in [H1-2]. In Model 3, we add all other student related variables to test [H1-3/4/5]. Model 4 focuses on the differences in *Nachhilfe* participation according to parents' educational background. We compare two groups: those from advantaged educational backgrounds and those from disadvantaged educational backgrounds, thus testing [H2-1/2/3/4/5]. As some colleagues have stressed (e.g. Mood, 2010), logistic coefficients and the often displayed odds ratios (*OR*) are not suitable for comparisons between models and groups. Hence, we post-estimated average marginal effects (*AME*). In contrast to *OR*, *AME* show no chances for the occurrence of a certain phenomenon, but rather specify by how many percentage points the average probability of the represented group of one variable is different from the probability in the reference group.

Results

Descriptive Statistics

Table 1 highlights our descriptive findings. Regarding the social origin of the families, we found that non-tertiary educated families more often use *Nachhilfe* (49.5%) than families with tertiary education degrees (35.6%). Differences according to parents' income and class position are not detected. High-income (43.2%) and salariat families (46.5%) do not considerably

more often invest in paid *Nachhilfe* than low-income (42.3%) or working-class families (47.7%). The biggest difference in the demand for *Nachhilfe* remains with students' performance. Below average performing students more often obtain paid *Nachhilfe* (58.6%) compared to above average (17.9%) and average performing students (45.8%). Nevertheless, a considerable proportion of high performing students received paid *Nachhilfe* in all three core subjects as well (Mathematics: 29.3%; English: 28.6%; German: 31.5%). This shows that there are, in fact, students obtaining *Nachhilfe* who obviously have no learning problems.

Table 1. Differences in the Use of Paid *Nachhilfe* According to Parents' and Students Background Factors

		Percentage of Nachhilfe participants	N (total)
Participation in paid Nachhilfe…		44.4	449
…according to highest parental education level:	*University degree*	35.6	160
	No university degree	49.5	289
…according to household-net-income:	*High income group (>150%)*	43.2	74
	Average income group	45.8	264
	Low income group (<70%)	42.3	111
…according to class of parents (ESeC):	*Salariat*	46.5	114
	Intermediate	38.2	136
	Working class	47.7	199
…according to parents' educational aspirations for their children:	*University degree*	38.0	150
	No university degree	47.8	299
…according to children's academic performance in school:			
GPA (all subjects)	*Above average (grades 1 to 2)*	17.9	84
	average (grade 3	45.8	225
	Below average (grades 4, 5, or 6)	58.6	140
Mathematics	*Above average (grades 1 to 2)*	29.3	164
	average (grade 3	49.0	153
	Below average (grades 4, 5, or 6)	58.3	132
English	*Above average (grades 1 to 2)*	28.6	175
	average (grade 3	50.3	153
	Below average (grades 4, 5, or 6)	60.3	121
German	*Above average (grades 1 to 2)*	31.5	181
	average (grade 3	50.8	195
	Below average (grades 4, 5, or 6)	60.3	73
…according to aspired school-leaving degree of the children:			
	Upper secondary school degree (Abitur)	46.9	303
	Lower secondary school degree (MSA and other)	39.7	146
…according to children's age:	*12- to 14-year olds*	36.8	239
	15- to 17-year olds	53.3	210
…according to children's own educational aspirations:	*University degree*	45.5	211
	No university degree	43.7	238
…according to children's sex:	*Female*	40.9	237
	Male	48.6	212

Source: LifE 2012; own calculation.

A difference between *Nachhilfe* participation according to school degree program is also visible in our data: Particularly students who pursue the *Abitur* make frequent use of paid *Nachhilfe* (46.9%) compared to those who pursue the MSA or other lower secondary degrees (39.7%). Furthermore, students of higher age (15- to 17-years old) show more experience with *Nachhilfe*. Finally, gender differences are detected: According to our data, boys (48.6%) use *Nachhilfe* more often than girls (40.9%).

As shown in Table 2, *Nachhilfe* participation of students is negatively correlated with parental education and aspirations, and the students' grades. The correlations between the predictor variables are mostly weak. We find a positive correlation between household-net-income and parental education (.24), but a negative correlation of parents' class with their education (-.22). Parents' and students' aspirations are also correlated (.33). Parental education is also weakly correlated with students' performance in mathematics and English (.11 to .14). Only students' grades in the three different subject areas German, mathematics and English show moderate correlations with each other (.37 to .56).

Table 2. Bivariate Correlation Statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Paid Nachhilfe (yes; ref: no participation)	1.00										
(2) Parental education level (university; ref: other) [1]	***-0.13***	1.00									
(3) Monthly Household-net-income[1]	0.05	***0.24***	1.00								
(4) Parental class (ESeC)[2]	0.03	***-0.22***	***-0.18***	1.00							
(5) Parents' aspirations (university; ref: other)	**-0.09**	***0.22***	***0.15***	***-0.21***	1.00						
(6) Students' grades in German[3]	***-0.23***	0.05	0.01	*-0.09*	***0.18***	1.00					
(7) Students' grades in Mathematics[3]	***-0.24***	**0.11**	*0.12*	-0.05	**0.09**	***0.37***	1.00				
(8) Students' grades in English[3]	***-0.27***	***0.14***	0.01	-0.04	***0.15***	***0.56***	***0.37***	1.00			
(9) Students' age (15–17-years; ref: 12–14-years)	0.17	-0.06	-0.03	0.06	0.02	0.01	-0.06	0.02	1.00		
(10) Students' pursued degree (Abitur; ref: other)	0.07	***0.14***	*0.09*	**-0.12**	***0.16***	-0.02	-0.02	-0.00	0.00	1.00	
(11) Students' own aspirations (university; ref: other)	0.02	***0.23***	*0.13*	**-0.12**	***0.33***	***0.17***	***0.14***	***0.20***	**0.12**	***0.13***	1.00
(12) Students' gender (male; ref: female)	-0.08	0.02	0.03	-0.01	0.01	***0.24***	0.04	***0.17***	0.00	0.02	0.09

Note. Significant correlations ($p < .05$) are printed in bold, highly significant correlations ($p < .01$) in bold italics and marginally significant correlations ($p<.10$) in italics. [1] Total household-net-income per month ranges from 670 Euro to 70.000 Euro. [2] Parental class are coded from 1 (higher professions and management occupations) to 9 (routine workers). [3] Grades are coded from 1 (insufficient/unsatisfactory) to 5 (very good).

Multivariate Analyses

Table 3 shows five logistic regression Models. The first model reveals that – contrasting to [H1-1] – neither parental SES nor aspirations positively influence the students' likelihood to obtain *Nachhilfe*. Parents' education level is even negatively related to *Nachhilfe* participation: If parents possess a university degree, their children are 15% less likely to pursue paid *Nachhilfe*. These first results indicate that high SES families can draw on other resources to support their children and have no considerably higher need to turn to *Nachhilfe*.

Table 3. Logistic Regressions Predicting Students' Participation in Paid *Nachhilfe* (Displaying AME)

			Dependent: Participation in paid *Nachhilfe*				
	Reference: Unpaid or no *Nachhilfe*		**M1**	**M2**	**M3**	**M 4**	
						University degree	**No University degree**
Parents' Background	**Education Level**	University degree	-.15**	-.12	-.14**		
		REF: no university degree					
	Household-net-income	High income group: >150%	.09	.10	.12	.06	.23*
		Average income group	.04	.04	.03	.00	.04
		REF: Low income group: <70%					
	Class (ESeC)	The Salariat	.04	.05	.05	.03	.07
		The Intermediate	-.08	-.06	-.05	-.04	-.05
		REF: The Working Class					
	Aspirations for children	University degree	-.08	-.03	-.08	-.13+	-.02
		REF: no university degree					
Students' Background	**School performance**	High GPA (grades 1 or 2)		-.26***	-.27***	-.18*	-.32***
		Low GPA (grades 4, 5, or 6)		.12*	.13*	.23*	.09
		REF: Average GPA (grade 3)					
	Age (quantity of education)	15- to 17-years old			.15**	.20**	.14**
		REF: 12- to 14-years old					
	Pursued degree (quality of education)	*Abitur*			.08+	-.03	.12*
		REF: MSA and other					
	Own educational aspirations	University degree			.10*	.07	.10+
		REF: no university degree					
	Gender	female			-.02	.14+	-.11*
	N (valid cases)		449	449	449	160	289
	Pseudo R^2 (McFadden)		.02	.08	.11	.14	.12

***P<0.001; **P<0.01; *P<0.05; +P<0.10

Source: LifE 2012; own calculation.

Model 2 adds students' performance and increases the model reliability by 6% (McFadden's pseudo R^2). Thus, performance is a stronger predictor than SES. As assumed in [H1-2], the overall probability to obtain *Nachhilfe* is highest for students with below average performance, who are 12% more likely to obtain *Nachhilfe* compared to those with average performance. High performers are least likely to use *Nachhilfe* (-26%).

As expected in hypotheses [H1-3/4/5] (Model 3), students enrolled in the *Abitur* degree program (+8%), with more education years (+15%), and university aspirations (+10%) have a greater likelihood to obtain *Nachhilfe*. The results of these first analyses indicate that *Nachhilfe* is a general remedial strategy used by all strata, possibly reducing educational differentials.

Model 4 subdivides the analysis according to parents' education background. In line with [H2-1], the household-net-income position does affect the probability of children from parents without tertiary education to obtain *Nachhilfe*. Especially high-income families are 23% more likely to pursue paid *Nachhilfe* for their kids compared to below average income families. As expected, the income position of the household plays a role after all.

In contrast to [H2-2], unexpected strata-specific differences regarding the impact of students' performance on *Nachhilfe* use are detected. Students from highly educated strata

are not more likely to obtain *Nachhilfe* if their grades are not below the average, whereas students from less educated strata with average GPA show no significant difference to low performing students in their likelihood to obtain *Nachhilfe*, indicating status upgrade motives also. We also find that students from less educated strata (especially boys: +11%) who pursue the *Abitur* (+15%) and intend to enter university (+3%) are more likely to obtain *Nachhilfe* compared to students from higher educated families.

These results indicate that low and middle status families (i.e. without tertiary education) use *Nachhilfe* to generally cope with the high demands at the upper secondary schooling level and to achieve status upgrading. Parents without university degrees seem less capable of supporting their children if they aim for the *Abitur* and intend to enter university than parents with university degrees. Students from highly educated families (especially girls: +14%) seem to be more likely to invest in *Nachhilfe* towards the end of secondary schooling (i.e. with higher age: +20%), prior to major exams such as the MSA and the *Abitur*, which largely influence the worth of the degree. Our results thus indicate that through *Nachhilfe* especially middle status parents without tertiary education but with sufficient financial resources try to ensure that their children will achieve the *Abitur*. With this former elitist diploma, low and middle strata children gain the opportunity to enter university and achieve better access to more attractive jobs, i.e. compensate the high requirements attached to the new standard school diploma *Abitur* and possibly even achieve a status upgrade as proposed by hypotheses [H2-3/4/5].

In sum, our analyses show that students of all strata use *Nachhilfe* for remedial purposes to achieve their pursued school degrees. *Nachhilfe* functions as a remedial strategy for those who encounter general learning deficits in school and as a compensatory and status upgrade instrument for those children from low and middle strata who face higher requirements in school when striving to achieve higher credentials, i.e. upper secondary and tertiary education degrees.

Conclusion

A positive significant impact of parents' SES and aspirations on their children's probability to obtain *Nachhilfe* could not be verified (disproving [H1-1]). However, when differentiating for the educational background of parents we found a significant impact of household income for lower educated families (confirming [H2-1]). Based on these findings, we suspect that middle strata families without tertiary education actually drive the increased demand for shadow education in Germany, because they seek a status upgrade through achieving higher educational credentials for their kids. Our analyses further showed that school performance remains the crucial factor for whether or not *Nachhilfe* is considered by families – independent of social background (confirming [H1-2], but not [H2-2]). Hence, we found no evidence that high educated parents have become more likely than other strata to invest in *Nachhilfe* to gain horizontal advantages for their children by achieving the best degrees with the highest GPA's.

As expected in [H1-4] and [H2-4], students' likelihood to obtain *Nachhilfe* increases with their age, i.e. with the higher requirements at the upper secondary level – for all strata.

In addition, we found that the qualitatively higher requirements of the highest degree program *Abitur* only significantly increase lower strata students' likelihood to obtain *Nachhilfe* (contrasting to [H1-3]). This indicates that students from lower and middle strata, who pursue the highest-ranking degrees, use *Nachhilfe* to deal with the higher curricular demands of this degree program. By achieving the *Abitur*, these students might already gain a status upgrade, as they have access to tertiary education and increase their chances on the labour market (as expected in [H2-3]). Furthermore, the expected impact of students' aspirations on *Nachhilfe* participation ([H1-5]) was verified: Children from parents without tertiary education but with high ambitions show a higher likelihood to obtain *Nachhilfe*. In addition, we found a high likelihood of low and average performing students from less educated backgrounds to obtain *Nachhilfe*. This supports the notion that lower and middle strata use *Nachhilfe* with the intention to achieve a status upgrade.

We conclude that, contrasting to past findings and assumptions from international and national research on shadow education, students from upper strata families in Germany are unlikely to use *Nachhilfe* for status maintenance purposes. Our findings indicate that the main reason for the increased demand for *Nachhilfe* in Germany is the need for remedial support caused by educational expansion and education reforms (compensatory strategy). We showed that more and more German students pursue the highest secondary schooling degree (*Abitur*), thus being confronted with higher demands than in the lower ranking tracks. Additional support becomes increasingly relevant, especially for those who intend to proceed to tertiary education and by this achieve status upgrades. In this sense, the higher participation in *Nachhilfe* in Germany rather reduces the SES achievement gap instead of widening inequalities.

In light of these findings, the often-made statements by proponents of social reproduction theories, arguing that investments in shadow education would inevitably lead to widening inequalities, have to be questioned. We too used rational choice and effectively maintained inequality theory to hypothesize on the possible rationales behind the increased *Nachhilfe* investment in Germany drawing on status motives. But instead of restricting our focus to upper strata's status maintenance strategies, we additionally considered the possibility that lower strata's status upgrade motives may play a considerable role in *Nachhilfe* demand, thus opening up to the possibility that *Nachhilfe* may help to tackle academic achievement gaps between students from high and low social strata. The primary use of *Nachhilfe* in Germany is directed at supporting students with low performance, who then might increase their chances to achieve higher degrees. Considering the recent findings of Guill, Lüdtke, and Köller (2019), using data from the representative German National Education Panel Study (NEPS), a reduction in the SES achievement gap remains questionable, though. The authors found no direct effects of *Nachhilfe* use on the students' performance development. But, similar to previous German research on the subject (e.g. Guill & Spinath, 2014; Hosenfeld, 2011), Guill et al. (2019) did not focus their analyses on private, paid *Nachhilfe* but rather used all possible kinds of *Nachhilfe* as their dependent variable. International research has shown, however, that the effects of shadow education vary considerably according to the used type of tutoring and between SES groups (e.g. Buchmann et al., 2010; Byun, 2014; Entrich, 2018), suggesting positive effects for Germany as well. Until now, neither SES group comparisons nor differentiated analyses focusing on different

types of *Nachhilfe* exist that clearly show whether shadow education in Germany holds positive effects for students' performance and educational pathways. Future studies should investigate the concrete effects of different types of *Nachhilfe* participation for different social strata to clarify whether and which students manage to reap the benefits of shadow education investments.

This study also holds policy implications insofar that we found no massive use of *Nachhilfe* for status maintenance of upper strata (yet), as confirmed for East Asia. We believe the reason for this is that the German education system does not possess "gatekeeper" exams that determine transitions to the upper secondary or tertiary education levels, such as the SAT (scholarly aptitude test) in the United States or entrance exams in Japan, South Korea, or China.[6] Nevertheless, recent reforms are likely to have caused increased competition between students in schools, while ranking systems for secondary schools and universities became more prominent (Weiss & Schindler, 2017). Our findings indicate that, up to now, the expansion of *Nachhilfe* participation remains an unintended but not yet negative outcome of educational expansion and recent education reforms in Germany. Whether this will change in the future depends largely on the kind of education policies that follow.

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6 In fact, policies in the United States and East Asia implemented various forms of state after-school programs to provide all students with opportunities for academic preparation for high-stakes exams and lessen the dependence and subsequent socioeconomic disparities in shadow education (Bae & Jeon, 2013; Kanefuji, 2015; Lubienski & Lee, 2013; Mori, 2013; Yamato & Zhang, 2017).

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