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Does the Effect of Social Origins on Educational Participation Change Over the Life Course?

Thorsten Schneider[1]

Summary

The aim of the paper is to investigate whether social origin has a diminishing influence on educational careers as children grow up or whether the effects remain constant. According to the selection hypothesis as well as the life course hypothesis, this influence decreases progressively at subsequent branching points, as children get older. Other approaches discuss the idea that some parental characteristics lose their impact during the educational career, while others gain importance. The empirical analyses concentrate on Germany and especially on dropping out of the 'Gymnasium'. This school type opens the way to an academic career and starts in most federal states at the very early age of ten years. The database is the German Socio Economic Panel study (SOEP), a large nationwide person and household survey. First, we estimate the probability that a child will attend the 'Gymnasium' immediately after primary school. Here we observe a very strong influence of parental characteristics. After this, the sample is restricted to those attending 'Gymnasium', and we model drop-out rates in the following years. In this second study, we find that students quit more often if their previous probability of entering the 'Gymnasium' was low. Higher educational levels of the parents show a particularly strong connection to lower exit rates. However, the influence of social origin seems here to be weaker than by the prior decision to enter this school type.

1 Introduction

The influence of social origins on participation in higher education has been well documented in a wide range of scholarly studies. Some cross-national variations can, however, be identified. In Germany, an extraordinarily strong connection exists between social origins and educational achievement. This result is shown by studies based on data from the 'Programme for International Student Assessment' (PISA) (Baumert, Schümer 2001: 349ff.; Schnepf 2002:

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1 The discussion paper contains some features of my doctoral thesis (Schneider 2005a).

34-41). One reason for this might be, that children are divided into different school tracks at a very early stage – when they are around the age of 10.

The different tracks produce different degrees of knowledge and lead to different school-leaving certificates. The chances and institutional opportunities to find an apprenticeship or get into a university depend heavily on school attainment. Therefore life chances are delimited in part by the early selection process in the German education system.

The problem of very early branching-points in a school system is that children's future abilities and potential for achievement are difficult to foresee when they are very young. Theories on educational attainment state that when parents are forced to make decisions on their children's post-primary educational tracks at this stage, they are heavily influenced by their own educational biographies and social positions (Blossfeld, Shavit 1993: 9).

In the German school system, the highest school track is the 'Gymnasium', an academic course leading to the 'Abitur', a diploma that qualifies one to apply for university entrance. Furthermore, it keeps options open for all kinds of apprenticeship training. Over 90 percent of the general university entrance qualifications awarded in the year 2001 were obtained by attending 'Gymnasium' (Statistisches Bundesamt 2003, own calculations). Thus, the 'Gymnasium' is the most important school track for obtaining higher qualifications and for achieving a good social position. Most young people embark on this school track directly after primary school. In later years, it is virtually impossible to switch to a 'Gymnasium', although politicians like to claim otherwise. Only after the tenth class some students with outstanding results in their final exams at the intermediate school enter the 'Gymnasium' (Bellenberg 1999: 133). The rarity of such cases underlines the difficulty in getting into a 'Gymnasium' at later stages. On the other hand, many students leave this type of school prematurely without obtaining the 'Abitur' (Schümer et al. 2002: 210; Bellenberg, Klemm 1998: 587).

Fifty years ago, when the school system was not as extensively developed, a larger part of children attended the 'Gymnasium' in order to attain an intermediate school qualification (Peisert, Dahrendorf 1967). This is no longer the case. Nowadays leaving the 'Gymnasium' is usually related to lower school achievements and marks. However, poor performance should not be seen as the cause of attrition but rather as an inducement. Research with schoolbook data shows that the marks of pupils who drop-out are as bad as those who repeat. Repetition, which is very common in the German school system, and attrition to a lower school track are two possible reactions to the same circumstances (Roeder, Schmitz 1995: 87). Unfortunately this research does not include measures of socio-economic background, only on marks and school attendance. Another study with older birth cohorts shows, that the parents' position in

the social structure influences a premature exit (Henz 1997). However, there is an unfortunate paucity of research on how social origin drives these dropout decisions.

It is useful to look at the drop-out phenomenon in the light of theories predicting changes in the influence of social origin on educational choice. First, children have to enter this school type at a very early age and therefore – as mentioned before – the parental influence should be very strong. Second, the 'Gymnasium' normally lasts 8 or 9 years, and if a student repeats classes, it lasts even longer. Thus, there is a long period in which pupils can drop-out, and during this time young people come of age.

In the next section, we discuss different views of how social origin influences educational choices and how this process changes over the educational career. Thereafter, we describe the data and the statistical methods used. This is followed by a presentation of the empirical results: in the first part, findings on the influence of social origin on choosing the 'Gymnasium'; and in the second, findings on dropping out of the 'Gymnasium'. In conclusion, we sum up the main findings and discuss potential directions for further research.

2   Theoretical background

The sociological theory on educational choice is mainly based on the work of Boudon (1974: 29ff.) and on his distinction between primary and secondary effects of stratification. The primary effects describe the influence of the social position of the parents on the cognitive development of the child. More highly educated parents and a better-equipped home environment stimulate the child's abilities and achievements. Due to different socialization processes, children from higher social classes have an advantage because they are more able to meet the requirements of a more advanced, more demanding education. The secondary effects include differences in how individuals assess the benefits of higher education and the financial (and social) costs attached to it, and in their expectations of successful completion. Taken together, these primary and secondary effects produce social inequality in educational participation. The majority of the sociological research on this topic has focused on the secondary effects[2].

In more recent research, Erikson and Jonsson (1996: 14ff.) developed a 'plain' model of the influence of social origin on educational choice combining these assumptions with the

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2   In contrast, the theory of cultural reproduction gives much greater emphasis to different patterns of socialisation, and also discusses whether teachers and the school system itself honour high and middle-class values in particular ways (Bourdieu 1974, 1997).

action theory termed 'Subjective Expected Utility' (SEU)[3]. The choice of school track, training scheme, university enrolment or labor market entry after completing an education level is based on the later expected benefit (*B*), the cost (*C*), and the expected success (*P*). Parents and/or children choose the option from which they expect the highest utility:

U = BP-C = max!

The expected benefits (*B*) are twofold: on the one hand the returns to education, meaning potential earnings, and on the other, possible social class status. It can be assumed that earnings are evaluated irrespective of one's own social position, but the value of class membership varies. Parents and children are strongly interested in avoiding social demotion. Thus, the better the position of the family, the greater the benefit of further education is.

However, the benefits *(B)* will only be realized if the student actually lives up to it. Thus, the benefit has to be weighted by the probability of success (*P*). Several factors play a role here. First, due to different socialization processes, the better the parents' social position, the higher the probability is rated. Second, the higher the parents' education, the more they will be able to support their children (at least in the first few years of school). Third, parents who attained high educational levels know from experience that not only the brightest children achieve higher formal qualification. Thus, they rate the required achievement levels lower. *In our empirical research, we hypothesize that the higher the parents' education is, the higher the probability of getting access to more demanding school tracks (hypothesis 1.1).*

Additionally it is assumed that the cultural capital does not only refer to formal qualification but also every-day life and activities, as described in detail in the contrasting approach of Pierre Bourdieu (1997). *We expect that parents attending highbrow art events have a higher degree of cultural capital, and that their children therefore profit by showing better cognitive development and school achievement (hyp. 1.2).*

Costs (*C*) are connected with further education. These can be direct costs, like school fees, expenses for books and tickets. However, opportunity costs may be even more important. These are the costs of delayed labor market entry due to longer-lasting education. This delay goes hand in hand with deferred earnings. People evaluate all these together as the total costs (*C*). *The better the financial situation of the parents, the lower they rate the financial burden (hyp. 1.3).*

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3 A similar model has been proposed by Esser in the year 1999. The main difference between both versions is, that Esser (1999: 266ff.) splits up the exepcted benefits of education (BP) into two seperate consequences: the expected financial returns (pU) and the expectations on an integenerational status loss (cSV). This model has reached some popularity in the German speaking educational research comunity (cf. Becker 2003: 3ff.).

However, one can ask whether costs are even relevant if the decision has to be made before compulsory education finishes. There are normally no tuition fees at secondary level I in Germany. On the other hand, deciding on a longer-lasting education or a track leading to university entrance is a decision with long-term consequences. Because of this, parents take not only their actual earnings into account but also their prospective income development. Goldthorpe e.g. (1996: 493ff.) discusses that the labor market risks and life cycle incomes vary between different social classes. Therefore the burden and possibility of coping with educational costs differ according to class status, and parents with a lower position more often opt for shorter tracks. Instead of taking social class into account, in the following we take into consideration whether or not the parents work in the civil service. Indeed, a large part of these employees in Germany – civil servants (known as 'Beamten') – bear no labor market risks and can expect increasing earnings in the professional life. The others generally still have lower risks than non-civil servants. *Given the high job security in the civil service, parents employed here more often send their children to longer-lasting education (hyp. 1.4).*

Additionally, we control for critical life events that can cause stress on both parents and children and lead to lower performance (Cherlin et al. 1991; Glass et al. 1985, Haveman et al. 1991). *If the parents break up or one of them dies, we expect a negative influence on the school career (hyp. 1.5).*

These hypotheses are tested for the first branching point in the German educational system, which takes place after completion of primary school. Only in a few federal states this time point is delayed by two years. Thus, most parents have to decide which kind of school their children should attend, usually among three school types. They base the decision on how they evaluate the cognitive challenge, the attainable degree, the subsequent educational opportunities, and last but not least, the labor market and earning chances. The 'Gymnasium' is the school type that leads to the highest-level diploma. In Germany, there also exist some comprehensive schools, but they are concentrated in only a few federal states. The proportion of pupils who move on to attain a university entrance starting from this type of school is very low, and thus we give little attention to comprehensive schools in the following. (For an overview over the German educational school system compare Figure A1 in the appendix.) Thus, the focus lies on the decision whether children will move to the most prestigious school type, the 'Gymnasium', or to another regular school type belonging to secondary level I after completing primary school.

Erikson und Jonsson (1996) – like other researchers – discuss how the influence of social origin varies over the life cycle. Blossfeld and Shavit state (1993: 9f.) that social origin effects decline from the earliest to later branching points in nearly all industrialized countries[4]. Normally the discussion applies to branching points: when students having reached a certain educational level must decide whether to continue and if so what track to choose. This paper looks not only at prefixed, institutionally given time points but also at phases where someone normally would expect students to simply continue.

According to the life course hypothesis, children's 'abilities' are not easily identified at early life stages, thus the parents make the educational decisions more according to their own education and social position. If the offspring is older, the abilities and possibilities of success can be rated more realistically. It is also assumed that there is a shift in the decision making process over time. If the children are very young, the parents decide. However, as children grow up they become increasingly independent of their parents. As a consequence of this, they play a more central role in the educational choice (Blossfeld, Shavit 1993). *Thus, we expect that the influence of social origin on dropouts declines during the 'Gymnasium' attendance (hyp. 2.1).*

Another approach focuses on unobserved differential selection processes. Mare (1993; 1980) states that the barrier to further education is high for children from lower social classes. Mostly, these children choose to pursue further education if they are exceptionally bright and/or highly motivated and therefore they face greater chances of success at later stages. As a consequence, the relationship between social origins and educational participation matters less if the population is restricted to those who have passed all earlier stages (see also Teachman 1987). The decreasing effect of social origin on educational choices can partly be traced back to the fact that social research does not observe relevant information like ability or achievement. As achievement is linked to social origin, the effect of social origin on educational participation is overestimated at early stages.

Some studies on students' achievement at the end of primary school shed light on the interplay between social origin, the child's achievement, the parents' educational decisions and school advices. At the end of the primary school pupils get a recommendation from the

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4   Cameron and Heckman (1998: 266-281) hold the view that most research results on this topic are based on statistical artefacts. The reason is that the estimations for different branching points are a sequence including a sample reduction and that the models use time-invariant characteristics. Changes over time are unobserved and therefore they are included in the error terms. This biases the coefficients of the observed characteristics. An additional problem is that although the population size varies (the samples are reduced step by step), coefficients are compared.

teacher, which school type they should or can visit at the next level. Only in a few federal states this recommendation is to a higher degree binding. Researches with detailed information on students' achievement show, that children from lower social classes have to achieve much more to get a positive recommendation (Lehmann et al. 1997, chapter 5; Ditton 1992: 132f.; see also Schwippert et al. 2003). Research also reveals, that parents holding a higher social position tend to send their child to the 'Gymnasium' even if the teacher thinks that the highly demanding track is unsuitable for him or her (Mahr-George 1999: 134). Consequently there is a negative correlation between the parents' social position and the child's achievement at the beginning of the 'Gymnasium'. Children with 'overambitious' parents will face more problems to solve the challenge and have a higher probability to drop-out. Thus, the selection hypotheses can be refined as follows: *Pupils from a lower social position who make the transition to the 'Gymnasium' have a higher probability of being successful (hyp. 2.2).*

However, according to PISA at the age of 15, there is a slight positive correlation between social position and achievement among students at 'Gymnasium' (Baumert, Schümer 2001: 370). A reason for this might be that social-class-specific home environments still have an influence on the child's development. It might be that children from lower social classes are slowed down, while those from a better background are stimulated.

For surviving in the most intellectual demanding school track, the 'Gymnasium', it might be helpful, to have highly educated parents. They can help their children complete homework and prepare for exams. This is especially true, if the child is taught in classical languages. Classical languages are rarely a subject apart from the 'Gymnasium'. *Higher educated parents can support their children and help to avoid a premature attrition (hyp. 2.3).*

Another reason for the above-cited slightly better achievement of higher-class pupils could be, that families with a good economic position foster weak children by additional private paid tutoring. Previous research has shown, that at least in the Western part of Germany, paid lessons are obviously a mean to achieve higher goals. By looking at the socio-economic position of the parents, it can be seen that greater family income promotes the decision to choose private lessons. Other characteristics of the parents or of the household have no additional influence on the use of remedial teaching (Schneider 2005b: 373). *This point suggests that income has a greater influence on the decision to remain at the 'Gymnasium' than on their decision to attend it in the first place (hyp. 2.4).*

According to Erikson and Jonsson (1996: 55) educational costs are more or less unimportant at early, but very important at later decision points. The highest cost might be relevant if children go to the university because this is often connected with leaving home and larger

living costs. Also the opportunity costs – the foregone income – are higher (see also Hansen 1997)[5]. In the educational phase analyzed here, secondary levels I and II, opportunity costs only become relevant at the time when compulsory education is completed. Depending on the federal state, this is after the ninth or tenth grade. *Thus, the financial situation of the parents should not matter much in the first years at 'Gymnasium' but more later (hyp. 2.5).*

Last but not least, as in the analysis of choosing different tracks after primary school, we control for critical life events. The former hypotheses 1.5 is used here, too. *If the parents break up or one of them dies, the educational achievement of the children can falter and therefore dropping out becomes more realistic (hyp. 2.6).*

3 Database, variables and statistical methods

For the analysis, we use the German Socio-Economic Panel Study (SOEP), which is a large, representative household and person study started in 1984. To ensure that the dataset is representative, it has been updated repeatedly since that time. The first new sample covered the inhabitants in East Germany and was drawn just before unification in 1990. Further samples target new immigrants (1994) and the whole population (1998, 2000).

SOEP covers a wide range of topics including working biographies, education, income, demographic developments, health, use of time, as well as satisfaction and values. Each person in a household that is 17 years or older gives his/her own answers. In addition, one person fills out the 'household questionnaire' which provides information on housing, but also on children and their school and kindergarten attendance (SOEP Group 2001). Thus, all information on both parents is provided first-hand. School attendance is surveyed every year through proxy and – from the age of 17 on – through personal interviews. According to the concept of SOEP, people are followed up even if they move out or the household splits up. This makes it possible to reconstruct the educational career of youth on a yearly basis.

3.1 Definition of transitions and independent variables

In the first analysis, the time point of shifting from primary to secondary school is fixed by institutional arrangements. Depending on the federal state, this transition has to be made after the fourth or the sixth class. In fact, the earlier time point does apply to the vast majority of

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5 However, research on picking up a university course can find no or only a modest influence of parents income in Germany (Merz, Schimmelpfennig 2000: 255). This result may be traced back to the grants (known as BAFöG) given to students with low income parents.

children. By comparing the school attendance at two different years, we can reconstruct the change over to the prestigious 'Gymnasium' or another type of school (excluding schools for mentally or physically handicapped children and comprehensive schools). As the SOEP started in 1984 we observe the first transitions from this year to 1985, the last transitions from 2002 to 2003. The East German federal states, who joined the Federal Republic in 1990, re-structured their educational system after unification. Here we observe transitions for the first time from 1992 to 1993. All together there are 3 003 children who change from primary to a secondary I school type, whereas 978 of them get access to the 'Gymnasium'.

For the second analysis the children's stay at the 'Gymnasium' is followed year by year. Children drop-out if they change to a less demanding school track or if they start an appren-ticeship without pursuing university entrance. All transitions that can be interpreted as 'leav-ing the academic career path' are counted as dropout. However, children can only be consid-ered if they are observed at least three times: last year in primary school, first time in 'Gym-nasium' and one year later. This is only the case by 803 of the 978 children entering the 'Gymnasium'.

A large number of episodes concerning the 'Gymnasium' attendance are right-censored. First, this is due to panel attrition. It takes place if the whole household refuses to participate or older children are not willing to answer the 'personal questionnaire'. Second the data only reaches to the year 2003, and therefore not all observed pupils have finished their school ca-reer by then.

To test the hypothesis on the influence of the parents' cultural capital, we use their for-mal qualification and their leisure time activities. The information on the parents' highest school certificate is stored in four dummy variables: *no qualification*, *lower secondary* ('Hauptschulabschluss'), *intermediate* ('mittlere Reife') and *upper secondary* ('(Fach-)Abitur'). The two lowest categories are put together in the analysis on dropouts, due to the few children at 'Gymnasium' with parents holding no qualification. If the parents do not have the same qualification level, the higher one is valid.

Cultural Capital in a broader sense is measured by affiliation to highbrow art like atten-dance of opera, theatre or art exhibitions. As the question is not asked every year, missing information is replaced by information from the previous year, and very seldom from two years before. The idea is, that cultural capital is to a high degree stable over time and thus filling gaps is not problematic. Mother and father's frequencies of visiting cultural events are – separately – stored into dummy variables, which differentiate between *never*, *sometimes* and *at least monthly*.

To test the hypothesis on the meaning of financial cost we use income and individual labor market risks as indicators. The income concept refers to the *disposable household income* including state transfers in the previous year. The income is need-adjusted by size and age structure of the household according to the revised OECD-equivalent scale[6]. As we deal with different years, the income values are deflated to prices of the year 2000. In a further step the logarithm of the income values is taken. In the study of drop-outs, we additionally construct interaction effects between income and the retention period in the 'Gymnasium'.

As an indictor for a foreseeable economic perspective we refer to mother or father's employment. If a parent is *employed in the civil service*, her or his job is normally secure. Thus, we construct a dummy variable for both parents, indicating such a work relationship. To reduce heterogeneity in the reference group, we construct a further variable, which covers *non-employed mothers* or *fathers*.

For hypothesis 1.5 und 2.6 we build a dummy variable, which has the value one if the parents have *divorced* after birth and before leaving primary school. In addition, children, who experienced the death of a parent, are grouped to this variable. However, this applies only to a few cases and we only consider them if the *father died*. For the study of drop-outs, the variable is updated every year.

As a characteristic of the child, we consider his or her gender, while girls (*females*) are coded as one and boys as zero.

In the second part of the paper, we use a further variable, which we call *social access probability*. Its value stems from the first estimation on entering the 'Gymnasium'. The values range between 0.03 and 0.91. For the estimation of survivor functions, the metric information is grouped into *low*, *medium*, and *high access probability*. Children are assigned to these three groups by dividing the probability distribution at the borders of the first and third quartile.[7] For the parametric models, we also construct time-varying interaction effects with the duration at 'Gymnasium'.

In order to have a flexible baseline rate in the event history model, we include for every year since entering the 'Gymnasium' an additional dummy variable. Unfortunately, these time points are not identical to grades, since in a few federal states the 'Gymnasium' starts from the seventh class and some pupils repeat once or more.

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6 For the scale construction the factor 1 is attached to the head of the household, the factor 0.5 to every additional person 15 years or older, and the factor 0.3 to children.

7 The first and the third quartile borders are observed if the access probabilities are 28 and 71 percent.

Besides the dummy variables for years since entering the 'Gymnasium' and the variable on family break down, there are further time-varying variables in the analysis of drop-out: attendance of high-culture events, current income as well as the combination of labor market position and work relationship. The Parents' formal qualifications and the child's gender are treated as time constant.

3.2 Statistical methods

In the first part of the study the dependent variable is dichotomous. It has the value one, if a child changes after primary school to 'Gymnasium' otherwise zero. Thus, we use logistic regression models to predict the probability ($p = P(y = 1)$) that a child with specific characteristics will gain access to the most prestigious school type. However, instead of the probability (see equation 1) the logarithm of the odds ($L(y = 1)$) is estimated. It is possible to calculate the probability of 'Gymnasium' attendance in a further step by using the estimation results (eq. 2).

$$L(y = 1) = \ln(\frac{p}{1-p}) = \alpha + \sum \beta_k x_k \qquad \text{(eq. 1)}$$

$$p = \frac{\exp(\alpha + \sum \beta_k x_k)}{1 + \exp(\alpha + \sum \beta_k x_k)} \qquad \text{(eq. 2)}$$

independent variables: x_k ; logit coefficients: α, β_k

To make interpretation easier we also calculate unit effects. They report the difference in probability by comparing two groups, measured by one qualitative variable, whereas all other variables are hold by their mean (eq. 3). In the case of continuous variables it makes sense to calculate the difference in probabilities from minus to plus a half standard deviation from its mean (Long: 1997: 148-168; Petersen 1985: 130f.).

$$p = P(y = 1 \mid x_1 = 1, x_2 = \overline{x_2}, ... x_k = \overline{x_k}) - P(y = 1 \mid x_1 = 0, x_2 = \overline{x_2}, ... x_k = \overline{x_k}) \quad \text{(eq. 3)}$$

In the second empirical part, we initially show some survivor functions (G(t)) to describe the longitudinal data (eq. 4). Here the Kaplan-Meier-method is used. To make group comparisons we refer to variables, which are time-invariant or at least can be assumed as such (Blossfeld, Rohwer 1995).

$$G(t) = \Pr(T > t) = 1 - F(t) \qquad \text{(eq. 4)}$$

To analyze the impact of social origin on dropping out of the 'Gymnasium', we use transition rate models. The hazard of a child prematurely exiting is estimated under the condition that she or he is still under observation and has not dropped out before (eq. 5). As we only have data on a yearly basis, we estimate a so-called discrete model. Because of this, the transition rate is a probability and we use the same logistic regression method as described in equation 2 (Yamagucchi 1991; Allison 1982).

$$r(t) = \Pr(T = t \mid T \geq t) = \frac{\Pr(T = t)}{\Pr(T \geq t)} = \frac{f(t)}{G(t)} \qquad \text{(eq. 5)}$$

In contrast to the survivor functions the observation period ends in the multivariate models at the sixth time point, as some students obtain their diploma after completing seven full-time years at the 'Gymnasium'.[8] This short institutional time span applies only to a few cases, in particular federal states (located in the former East Germany). Pupils at 'Gymnasium' normally have to complete in the observed time period nine full-time years. However, leaving the 'Gymnasium' with a diploma means no longer being in the risk set. Thus, school-leavers have to be excluded, but at the same time, cannot be treated as ordinary censored cases as they have been successful. The end of their schooling is determined by institutional rules and not by their own decision. To avoid biased estimations, the observation window has to end so early.

4 Empirical results about the way in and out of the 'Gymnasium'

4.1 The first step into the academic career – the entry into the 'Gymnasium'

The fact that a student's chance of entering the 'Gymnasium' after primary school depends heavily on social origin can be already seen by the bivariate summary statistics. For example, if the parents do not hold any kind of formal school qualification or the lowest level thereof, the child has a probability of 6 or 14 percent respectively of attending a 'Gymnasium'. But if at least one parent has an upper secondary school qualification, the probability is 68 percent (cf. Table 1 on next page). The figures for mothers attending highbrow art are very similar. Smaller differences can be found in the sample for experiencing family break down and for child's gender. For example, the difference between boys and girls is 7 percent points, whereas girls have higher chances of making the step into the 'Gymnasium'.

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8 In fact two persons reach even earlier their qualification for the university entrance. Both are treated as right censored form the time point of successful school finishing. They are only a small figure compared to the population under study and thus the estimation results schould not be biased.

Table 1   Summary statistics of the dummy-variables used in model 1, Table 3, for the transition from primary school to a secondary I school type

	All transitions	Only to'Gymnasium'	
Number of transitions	3033	978	*32%*
	100%		
Parents' highest school qualification			
No qualification	130	8	*6%*
	4%		
Lower secondary	1225	168	*14%*
	40%		
Intermediate	985	332	*34%*
	32%		
Upper secondary	693	470	*68%*
	23%		
Mother's participate in highbrow art			
Never	1331	221	*17%*
	44%		
Sometimes	1425	593	*42%*
	47%		
At least monthly	277	164	*59%*
	9%		
Mother's employment			
Outside civil service or self-employed	1199	375	*31%*
	40%		
In civil service	544	252	*46%*
	18%		
Not employed	1290	351	*27%*
	43%		
Divorce (or death of father)			
No	2789	916	*33%*
	92%		
Yes	244	62	*25%*
	8%		
Gender			
Male	1522	441	*29%*
	50%		
Female	1511	537	*36%*
	50%		

Note: The sample consists of 3 033 children making a transition from primary to a secondary I school type. 978 of them choose the 'Gymnasium', which means 32 percent. 1 199 mothers work outside the civil service, which are 40 percent of all mothers. Their children have a probability of 31 percent entering the 'Gymnasium'. Sources: SOEP 1984-2003; own calculations.

As the household income is measured on a metric scale and used in the estimation models in logarithmic form, we present the medians and means of both kinds of income. If we look at Table 2 on this side, we can see for example that the parents' mean income is almost 1.4 times higher in families whose children attend a 'Gymnasium' than in families whose children

choose another school type (18 597€ compared to 13 415€). The ratio is a little bit weaker by comparing the median incomes, however the relationship is not altered.

Table 2   Means of the annual household equivalent income differentiated between transitions to 'Gymnasium' and other school type (for model 1, Table 3)

		'Gymnasium'	Others
In Euro	Median	16576	12423
	Mean	18597	13415
	S.d.	8647	5671
In logarithm	Median	9.72	9.43
	Mean	9.74	9.43
	S.d.	0.42	0.38

Sources: SOEP 1984-2003; own calculations.

The influences of different family characteristics and of child's gender on choosing the 'Gymnasium' are estimated by two logistic regression models. The first contains some special features on mothers, the second on fathers. The results are presented in Table 3 on page 16. The number of children is approximately 3 000.

According to the theory on educational choice, the success probability is evaluated looking at the child's ability and the parents' own educational history (see hypothesis 1.1). We see in model 1 and 2, that the logit coefficient for lower educated parents is significant and negative, the coefficient for the best qualified is positive and also significant, while parents with a median school certificate are the reference group. Thus, the higher the parents' formal qualification is, the more likely it is that the child will opt for the most demanding school type. This is in line with hypothesis 1.1.

Leisure time activities, which are used as an indicator of cultural capital in a broader sense, are highly significant as well. The size of the effect can be evaluated by looking at the unit effects. If a mother attends highbrow art occasionally or monthly, their child is 12 to 19 percentage points more likely to enter the 'Gymnasium', when compared to a case where the mother never attends such events. Compared to this, the influence of father's cultural event participation is small. If he does so sometimes or at least monthly, the child's probability is only 7 or 9 percentage points higher. The effects for mothers are obviously stronger than for fathers. This is not astonishing, as today's mothers are still more occupied with childbearing than fathers and they spend more time with their offspring. Thus, their cultural capital (language, knowledge, etc.) is transmitted to a greater extent to their children. This finding

confirms the assumptions of cultural theory (cf. hypothesis 1.2) as well as the meaning of primary effects in the educational choice approach.

The two models seem also to confirm hypothesis 1.3, that the financial burden of longer-lasting education is greater if the family income is low, because we observe a positive and significant logit coefficient for the income variable. This means, the better the financial situation is, the higher the probability that the child will shift to a 'Gymnasium'. However, models including income information from earlier years in childhood call into question whether educational costs really matter for this kind of school choice (Schneider 2004: 481ff.). These kinds of analyses show that the income situation observed in former years is more important than the current income situation (see also appendix, Table A1). This is a hint that higher incomes lead to a better material environment and therefore to better opportunities. The cognitive developement of these children might be stimulated to a greater extent, and therefore the perfom better later on in school.

Another indicator related to the prospective financial situation also tests the relevance of costs: the parents' job security. Indeed, if the mother or the father is employed in the civil service, the child has between 6 and 7 percent higher chances of entering the 'Gymnasium' than a child with otherwise-employed parents. This corroborates hypothesis 1.4, whereby parents take the future income situation into account when they evaluate the utility of different school tracks.

If the mother is not employed, we observe a higher entrance probability as well, although the logit effect is only significant at the 10 percent level. This is not the case in model 2 with father's economic activities. Here we can see a negative effect compared to employed fathers (outside the civil service), which indicates that their children have lower access chances to further education. However, the logit coefficient fails the 10 percent significance level. It is worthy to note, that the category 'not employed' is very different for fathers and mothers in Germany and therefore in the dataset, too. While these fathers are often unemployed, most mothers are economically inactive and are full-time family and household managers[9]. Because of this contrary signs of the coefficient can be observed for non-employed mothers and fathers.

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9   In the group of not employed fathers about two out of three are unemployed, in the same categorie only every seventh mother is accounted in such a way.

Table 3   Logistic regression models for the probability of choosing the 'Gymnasium' after primary school

	Model 1	**(Mother)**	**Model 2**	**(Father)**
	Coeff. (s.e.)	Unit effects[#]	Coeff. (s.e.)	Unit effects[#]
CULTURAL CAPITAL				
Parents' highest school qualification				
(intermediate)				
No qualification	-1.47	-20%	-1.60	-22%
	(0.38)**		(0.38)**	
Lower secondary	-0.85	-16%	-0.95	-18%
	(0.11)**		(0.12)**	
Upper secondary	1.08	24%	1.08	24%
	(0.11)**		(0.12)**	
Mother's / father's				
Participation in highbrow arts *(never)*				
Sometimes	0.61	12%	0.34	7%
	(0.10)**		(0.10)**	
At least monthly	0.85	19%	0.44	9%
	(0.17)**		(0.19)*	
ECONOMIC RESOURCES				
Equivalent income, ln	1.06	9%	1.16	9%
	(0.13)**		(0.14)**	
Mother's / father's				
job security *(other employment)*				
Employed in civil service	0.32	7%	0.30	6%
	(0.12)**		(0.12)*	
Not employed	0.20	4%	-0.36	-7%
	(0.11)+		(0.22)	
CRITICAL LIFE EVENT				
Divorce (or death of father)	-0.40	-7%	-0.86	-14%
	(0.17)*		(0.24)**	
Gender *(male)*				
Female	0.41	8%	0.39	8%
	(0.09)**		(0.09)**	
Constant	-11.55	Ø 28%	-12.18	Ø 28%
	(1.29)**		(1.35)**	
Log Likelihood				
Starting value	-1801.29		-1906.86	
End value	-1415.59		-1498.21	
Pseudo-R^2 (McFadden)	21.4		21.4	
Observations	3033		2861	

\#   Unit effects calculated for dummy-variables, indicating differences in probability of choosing the 'Gymnasium' (all other variables at mean). For the metric variable income, the difference is calculated for the shift from +/- ½ s.d. of the mean logarithm income. References groups: italic and in parentheses. Significance level: + significant at 10%; * significant at 5%; ** significant at 1%. Sources: SOEP 1984-2003; own calculations.

The multivariate results show that children who experienced parents divorce or father's death have lower chances of going to the 'Gymnasium'. As we control for household income, this lower transition probability should not be caused by poverty or a squeezed income situation.

The last variable 'child's gender' confirms other studies and the above presented bivariate figures: Girls perform better than boys and they are more successful in the school system. This can be seen in model 1 and 2, where we observe positive and highly significant coefficients for girls.

4.2 Leaving the academic track – dropping out of the 'Gymnasium'

In this section, first we present some survivor curves in order to show how widespread premature leaving is. Then we switch to the multivariate analysis. Figures 1a to 1c show the proportion of 'successful' children that differ in terms of their access probability, the parents' highest educational qualification, as well as the child's gender. Successful means, that the observed students still visit this school type – regardless of whether they have repeated one or more classes – or have already reached the qualification for university entrance.

According to hypothesis 2.2, children with low social chances of attending a 'Gymnasium' after primary school dropout less frequently since they had to be especially bright and motivated to make the first 'leap'. To test this we use the by model 1 (see Table 3, page 16) predicted probabilities of shifting to the 'Gymnasium'. In Figure 1a there are survivor curves for children with low, medium and high access probabilities. We can see that children with low access probability to the 'Gymnasium' drop-out more often than the others. Their survivor curve is, at every single observation point, the lowest. The curves for children with a middle or a high access probability are above and do not differ from one another. Six years after we observed the children the first time at the 'Gymnasium', only 65 percent of students with low access probability are still in the track. The figures are 80 and 83 percent for students with middle or high access probability. At the end of the observation window, only 46 percent of the children with low access probability acquired a diploma, whereas 69 and 72 percent of the others did. Obviously, social origins play a prominent role for being successful in the most prestigious school track.

If we consider the children by their parents' highest educational qualification, we see a similar picture. The higher the parents' education is, the weaker the decline of the curve and therefore the higher the success rates (cf. Figure 1b).

Figure 1   Survivor functions for dropping out of the 'Gymnasium'

1a   access probability

1b   parents' highest school qualification

1c   child's gender
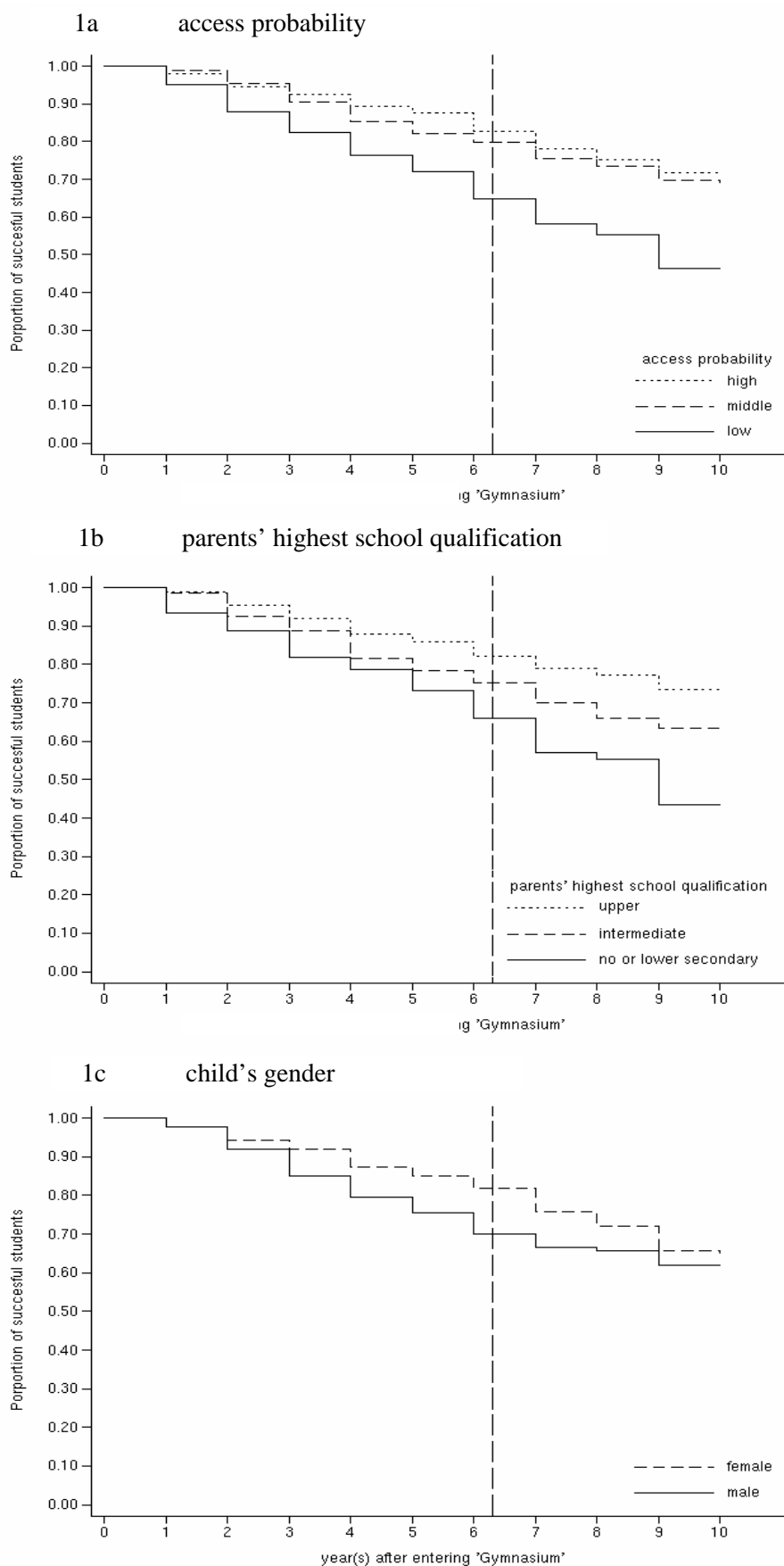
Sources: SOEP 1984-2003; own calculations.

The last graph displays gender specific differences. In the first two years, there is hardly any difference. Later on, the distance between the curves widens (cf. Figure 1c). Boys, who have lower access chances to the 'Gymnasium', dropout more often in their school career. At the end of the observation period, when we observe the successful children, the gender differences narrow. However, the case numbers are not very high at the last observation points. Thus, it is not clear whether the gender difference really does diminish.

To analyze the impact of social origin on the chances of going on with the 'Gymnasium' attendance, we estimate transition rate models for discrete time. As discussed in section 3.2 we close the observation period after the sixth time point, as some few students obtain their diploma then. Some information on the variables used in the following is shown in Tables A2 and A3 in the appendix. There the distribution of the characteristics for the first observed time point after entering the 'Gymnasium' is displayed.

Model 3, Table 4, contains the variable for the social access probability of having entered the 'Gymnasium' and dummy variables for each observation year. The time dummies are only used to allow a flexible baseline rate and are not discussed further more. For the variable indicating the access probability, a negative coefficient is estimated, which is significant on the 1 percent level. Negative coefficients indicate lower transition rates and therefore fewer drop-outs. Consequently, higher access probabilities go hand in hand with greater chances of staying at the 'Gymnasium'. Thus, the estimation confirms the results displayed in Figure 1a (page 18).

Hypothesis 2.1 states: the influence of social origin declines over the school career. To test this, interaction effects between the access probability and the time spent in the 'Gymnasium' are modeled. However, we can not observe that the effect of social origin on dropping out of this school type weakens over time. In model 3 as well as in model 4, (page 20), the main effect is negative and significant. In contrast to this, the interaction effects are far from any acceptable significance level. With this kind of modeling we can not confirm that social origin loses its impact.

In the following we discuss whether the costs increase in importance over the school career. One reason might be that opportunity costs become more relevant when compulsory full-time education is over (see hypothesis 2.5). Models 6 to 9, presented in Table 5 on page 22, contain different income information. In addition, the parents' highest education and the child's gender are controlled for. Model 5 takes current income into consideration, which is observed one year before the possible dropout takes place. The estimated coefficient is nega-

tive but not significant. In the following two models, interaction effects are included with time since entry into the 'Gymnasium'. But neither the main effect of income nor the interaction effects are significant. Thus, income seems to have no influence on the process of dropping out.

Table 4 **Access probability and the risk of dropping out of the 'Gymnasium' (discrete event history analysis)**

	Model 3 Coeff. (s.e.)	Model 4 Coeff. (s.e.)	Model 5 Coeff. (s.e.)
Access probability	-1.66	-1.57	-1.77
	(0.38)**	(0.44)**	(0.51)**
Interaction effects			
Access pr. * 5/6 years		-0.36	
		(0.90)	
Access pr. * 4/5/6 years			0.27
			(0.77)
Years at 'Gymnasium' (*1 year*)			
2 years	0.74	0.74	0.74
	(0.30)*	(0.30)*	(0.30)*
3 years	0.76	0.76	0.77
	(0.31)*	(0.31)*	(0.31)*
4 years	0.97	0.97	0.86
	(0.31)**	(0.31)**	(0.44)+
5 years	0.46	0.61	0.35
	(0.37)	(0.52)	(0.49)
6 years	0.98	1.14	0.87
	(0.35)**	(0.51)*	(0.47)+
Constant	-3.04	-3.08	-3.00
	(0.28)**	(0.30)**	(0.31)**
Log Likelihood			
Starting value	-546.63	-546.63	-546.63
End value	-530.37	-530.29	-530.31
Person-years	3193	3193	3193

The estimations are based on 806 students at 'Gymnasium'; 131 students drop-out. References groups: italic and in parentheses. Significance level: + significant at 10%; * significant at 5%; ** significant at 1%. Sources: SOEP 1984-2003; own calculations.

In the following we discuss whether the costs increase in importance over the school career. One reason might be that opportunity costs become more relevant when compulsory full-time education is over (see hypothesis 2.5). Models 6 to 9, presented in Table 5 on page 22, contain different income information. In addition, the parents' highest education and the child's gender are controlled for. Model 5 takes current income into consideration, which is observed

one year before the possible dropout takes place. The estimated coefficient is negative but not significant. In the following two models, interaction effects are included with time since entry into the 'Gymnasium'. But neither the main effect of income nor the interaction effects are significant. Thus, income seems to have no influence on the process of dropping out.

In addition, we control for changes in the income situation. We do this by putting the income observed before entering the 'Gymnasium' and the current income at the same time into model 9. Surprisingly, the former income has a strong effect, while the current income still has no importance.[10] The higher the parents' income while the child was in primary school, the fewer transitions are observed later on. Because of the results from model 5 to 9 we can confirm neither hypothesis 2.4, that a better financial situation of parents hinders drop-out in general, nor hypotheses 2.5, that the costs of education are becoming more important for decisions in the course of school attendance.

In the last model we include all characteristics used before when we analyzed the access to the 'Gymnasium'. There we found that mothers and fathers with high job security send their children more often to the 'Gymnasium'. However, for dropping out of school, we cannot find any effect (only results for mothers displayed). Although the coefficient estimated for mothers employed in the civil service is negative and consequently has the expected sign, it is far away from any justifiable significance level (see model 10, Table 5).

To test hypothesis 2.3 we control for the parents' formal education. Higher education goes hand in hand with lower transition risks in model 10 (as well as in model 5 to 9). This is especially true if the parents hold the diploma normally attained upon completion of the 'Gymnasium'. However, no significant effects can be found for the variables on highbrow art activities, which refer to the parents' cultural capital. Perhaps the effect of the formal school certificates should be interpreted more as the avoidance of demotion, or as the parents' knowledge that even children with lower school achievement are capable of attaining the diploma.

The loss of a parent is considered as one possible critical life event in childhood in our study. According to hypothesis 2.5, such an event should have negative consequences on the educational career. However, we do not find that separation of parents or the death of the father lead to a significant premature exit out of the analyzed school track.

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10 If we construct a model with the former income as a predictor for dropping out and do not take the current income into account, we get pretty much the same result. The estimated coefficient for the former income is then -0.65 and at the 5 percent level significant, too (for more details see model A3, in table A4 in the appendix).

Table 5   The influence of social origin on dropping out of the 'Gymnasium'

	Model 6 Coeff. (s.e.)	Model 7 Coeff. (s.e.)	Model 8 Coeff. (s.e.)	Model 9 Coeff. (s.e.)	Model 10 Coeff. (s.e.)
ECONOMIC RESOURCES					
Income at entering the 'Gymnasium'				-0.73 (0.35)*	-0.33 (0.24)
Current income	-0.36 (0.23)	-0.26 (0.29)	-0.31 (0.25)	0.10 (0.33)	
Interaction effects					
Current income*5/6 years		-0.23 (0.43)			
Current income*4/5/6 years			-0.22 (0.51)		
Mother's job security *(other employment)*					
Employed in civil/public service					-0.20 (0.22)
Not employed					-0.18 (0.22)
CULTURAL CAPITAL					
Parents' highest school qualification					
(no or lower secondary)					
Intermediate	-0.31 (0.23)	-0.31 (0.23)	-0.31 (0.23)	-0.25 (0.23)	-0.30 (0.24)
Upper secondary	-0.61 (0.25)*	-0.61 (0.25)*	-0.61 (0.25)*	-0.50 (0.25)*	-0.58 (0.26)*
Mother's participation in highbrow art					
(never)					
Sometimes					-0.15 (0.23)
At least monthly					-0.05 (0.30)
CRITICAL LIFE EVENT					
Divorce (or death of father)					0.48 (0.31)
Gender *(male)*					
Female	-0.56 (0.18)**	-0.56 (0.18)**	-0.57 (0.18)**	-0.55 (0.18)**	-0.54 (0.18)**
Years at 'Gymnasium' *(1 year)*					
2 years	0.79 (0.30)**	0.78 (0.30)**	0.78 (0.30)**	0.77 (0.30)*	0.79 (0.30)**
3 years	0.81 (0.31)**	0.81 (0.31)**	0.81 (0.31)**	0.79 (0.31)*	0.81 (0.31)**
4 years	1.00 (0.31)**	1.65 (1.21)	1.00 (0.31)**	0.99 (0.31)**	1.00 (0.31)**
5 years	0.49 (0.37)	1.14 (1.23)	1.09 (1.44)	0.49 (0.37)	0.51 (0.37)
6 years	1.01 (0.35)**	1.66 (1.23)	1.62 (1.45)	1.01 (0.35)**	1.02 (0.35)**
Constant	-2.15 (0.64)**	-2.42 (0.81)**	-2.28 (0.71)**	-1.50 (0.73)*	-2.07 (0.68)**
Log Likelihood					
Starting value	-544.64	-544.64	-544.64	-544.64	-544.64
End value	526.35	-526.26	-526.20	-524.19	-524.39
Person-years	3146	3146	3146	3146	3146

For notes see bottom of Table 4, page 20.

For children's gender, we get the same result as for entering the 'Gymnasium': girls do better! They have higher access probability and lower rates of dropping out (see also Figure 1c, page 18).

5   Conclusion

It should be noted that a direct comparison of the effects is not possible. The second sample is only a sub sample of the first and therefore the case number is lower. Secondly, the statistical methods are not identical. However, the results strongly suggest that dropping out is not so selective.

Whereas we observed very strong effects of social origin on school choice at the end of primary school, they are much lower in the analyses dealing with dropping out of the most prestigious and challenging school type, the 'Gymnasium'. This is in accordance with Mare's (1980) selection hypothesis, which states that children become more homogenous the further they proceed in their education. As a consequence of this, the influence of social origin is less pronounced in later educational decisions.

On the basis of results from achievement studies we formulated the selection hypothesis in a much more stronger sense. It was predicted that no children from lower social classes enter the 'Gymnasium' if they are not particularly outstanding achievers, while parents with a higher position send children with lower achievements to this school type as well. Thus, the latter will face more problems later on and will dropout more often. The empirical results could not confirm this hypothesis. Children with lower social chances of access to the 'Gymnasium' in fact have the highest drop-out rates.

An alternative explanation is offered by the life course hypothesis. According to this approach, the influence of social origin should reduce as children grow up. If this is true, this should take place as well through the process of dropping out of the 'Gymnasium'. Such an interrelationship could not be confirmed with the analyses presented here.

We also could not confirm the assumption that the cost of education will gain importance over the course of attending 'Gymnasium', since opportunity costs rise after completing compulsory education. Astonishingly, we found no influence at all of the parents' current income on dropping out, but we did find an influence of former income measured during primary school attendance.

To weaken the extra-ordinary strong influence of social origin on educational attainment in Germany, a longer lasting joint time in school and consequently a later first branching

point might be a solution. As a by-product, things like down-grading from the 'Gymnasium' to a less demanding and less prestigious school type would not take place any more – at least not at young ages. This would save some children from serious emotional burdens of failure. These stresses do not only effect those who actually drop out, but also the ones that fear having to do so.
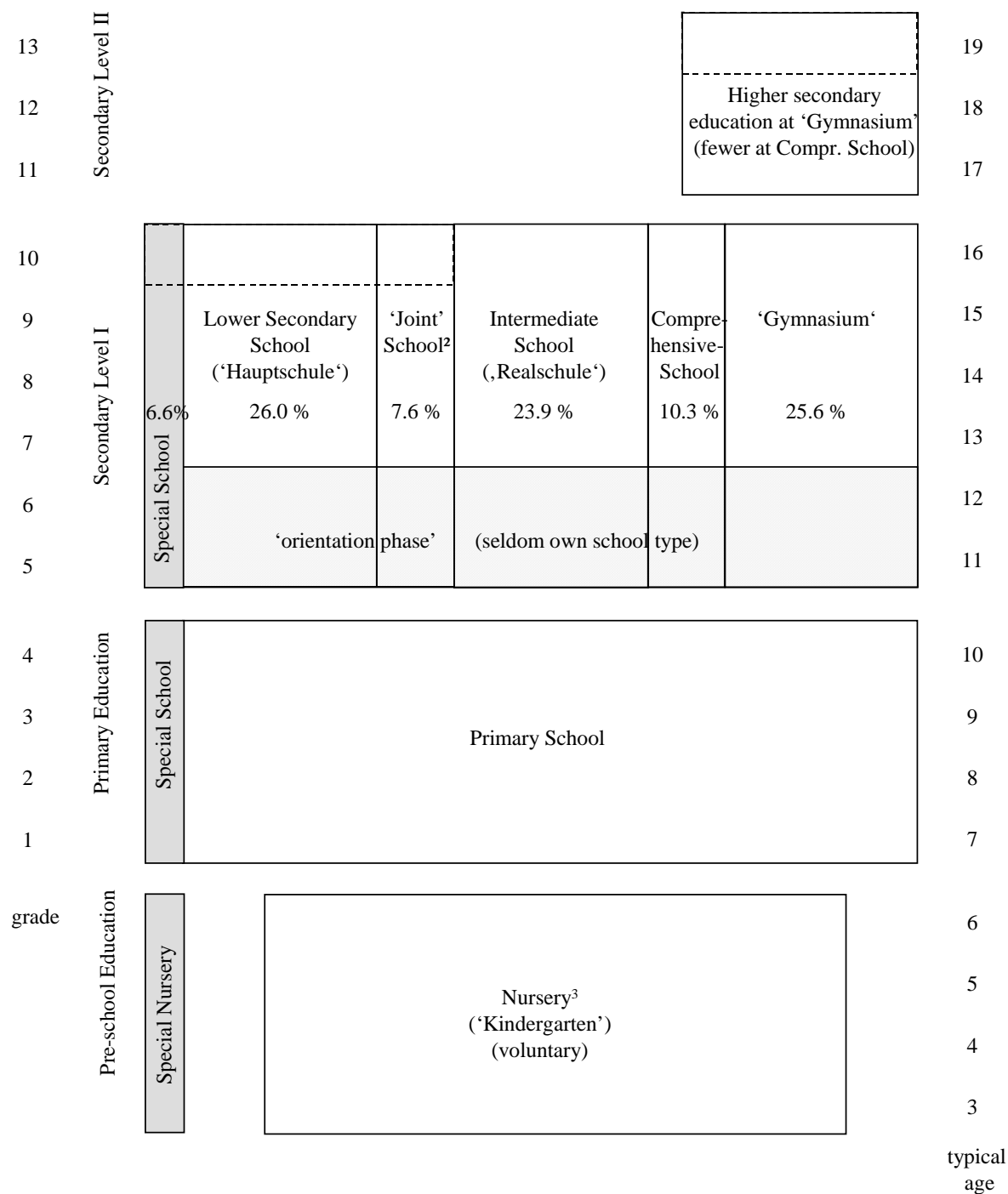
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Appendix

Figure A1 The structure of the general education system in Germany[1]
(without vocational and university education)

Secondary Level II (grades 13, 12, 11 / ages 19, 18, 17)				Higher secondary education at 'Gymnasium' (fewer at Compr. School)	

Special School 6.6%	Lower Secondary School ('Hauptschule') 26.0 %	'Joint' School[2] 7.6 %	Intermediate School (,Realschule') 23.9 %	Compre-hensive-School 10.3 %	'Gymnasium' 25.6 %
	'orientation phase'		(seldom own school type)		

Secondary Level I (grades 10–5 / ages 16–11)

Primary Education (grades 4–1 / ages 10–7):
Special School | Primary School

Pre-school Education (ages 6–3):
Special Nursery | Nursery[3] ('Kindergarten') (voluntary)

grade ... typical age

[1] Including the proportion of 14-years old at different secondary level I school types in the year 1997/98 (Statistisches Bundesamt 1999: 43).

[2] 'Joint Schools' combine lower und intermediate secondary level I courses.

[3] The Kindergarten does not belong to the school system.

Table A1 The influence of household income observed in different years on choosing the 'Gymnasium' after primary school (logistic regression models)

	Model A1 Coeff. (s.e.)	Model A2 Coeff. (s.e.)
Parents' highest school qualification		
(intermediate)		
No qualification	-1.91	-1.81
	(0.52)**	(0.74)*
Lower secondary	-0.99	-0.78
	(0.13)**	(0.17)**
Upper secondary	1.23	1.46
	(0.14)**	(0.18)**
Equivalent income, ln		
current	0.58	0.20
	(0.20)**	(0.25)
For 4 years	0.83	0.92
	(0.21)**	(0.28)**
For 8 years		0.49
		(0.22)*
Constant	-4.37	-4.96
	(0.48)**	(0.67)**
Log Likelihood		
Starting value	-1270.32	-771.22
End value	-1007.83	-599.85
Pseudo-R^2 (McFadden)	0.21	0.22
Observations	2014	1200

References groups: italic and in parentheses. Significance level: + significant at 10%; * significant at 5%; ** significant at 1%. Sources: SOEP 1984-2003; own calculations.

Table A2 Summary statistics of the dummy variables one year after entering the 'Gymnasium' (t=1)

	Case numbers	In percent of all
Total	806	*(100%)*
Mother's employment		
Employed outside civil/public service	321	*(40%)*
In civil/public service	223	*(28%)*
Not employed	262	*(33%)*
Parents' highest school qualification		
No qualification or lower secondary	150	*(19%)*
Intermediate	280	*(35%)*
Upper secondary	376	*(47%)*
Mother's participation in highbrow		
Never	172	*(21%)*
Sometimes	509	*(63%)*
At least monthly	125	*(16%)*
Divorce (or death of father)		
No	751	*(93%)*
Yes	55	*(7%)*
Gender		
Male	364	*(45%)*
Female	442	*(55%)*

Sources: SOEP 1984-2003; own calculations.

Table A3 Summary statistics of the annual household equivalent income and the former access probability to 'Gymnasium' (observed at t = 1)

	Median	Mean	S.D.
Income in Euro	16513	18503	8410
Income in logarithm	9.71	9.74	0.42
Access probability	0.49	0.49	0.24

Sources: SOEP 1984-2003; own calculations.

Table A4 **The influence of former household income and parents' education on dropping out of the 'Gymnasium' (discrete event history analysis)**

	Model A3 Coeff. (s.e.)
Income, ln	
At entering the 'Gymnasium'	-0.65
	(0.26)*
Parents' highest school qualification	
(no or lower secondary)	
Intermediate	-0.25
	(0.23)
Upper secondary	-0.49
	(0.25)*
Gender *(male)*	
Female	-0.55
	(0.18)**
Years at 'Gymnasium' (*1 year*)	
2 years	0.77
	(0.30)*
3 years	0.80
	(0.31)*
4 years	0.99
	(0.31)**
5 years	0.49
	(0.37)
6 years	1.02
	(0.35)**
Constant	-1.43
	(0.69)*
Log Likelihood	
Starting value	-544.64
End value	-524.23
Person-years	3146

The estimations are based on 806 students at 'Gymnasium'; 131 students drop-out. References groups: italic and in parentheses. Significance level: + significant at 10%; * significant at 5%; ** significant at 1%. Sources: SOEP 1984-2003; own calculations.