Educational Expansion and Persistent Inequalities of Education

Utilizing Subjective Expected Utility Theory to Explain Increasing Participation Rates in Upper Secondary School in the Federal Republic of Germany

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This investigation attempts to answer the question why more and more parents have chosen the *Gymnasium* for their children's secondary school education in post-war West Germany. Based on the theory of subjective expected utility, the crucial mechanisms of parental educational decisions have been emphasized. From this perspective it is assumed that increasing educational motivation coupled with changes in the subjective evaluation of the cost–benefit of education were important conditions for an increasing participation in upper secondary schools. These were, however, in turn, the result of educational expansion. The empirical analyses for three time-periods in the 1960s, 1970s, and 1980s confirm these assumptions to a large degree. Additionally, empirical evidence was found to suggest that in addition to the intentions of parents and the educational career of their children, structural moments of educational expansion and their own inertia played an important role in the pupils' transition from one educational level to the next. Finally, evidence was found that persistent class-specific educational inequality stems from a constant balance in the relative cost–benefit advantages between social classes as well as from an increasing difference of primary origin effect between social classes in the realization of their educational choice.

Introduction

As in other modern countries, there has been an increase in educational participation in the Federal Republic of Germany since the early post-war period (Shavit and Blossfeld, 1993). This educational expansion is correlated with an increase in the educational participation rates in all social classes (Leschinsky and Mayer, 1990: 35). In 1952, 18 per cent of the pupils aged 13 attended intermediate secondary school (*Realschule*: 12 per cent) or upper secondary school (*Gymnasium*: 6 per cent), while in 1989 almost 56 per cent of 13-year old pupils (*Realschule*: 26 per cent and *Gymnasium*: 30 per cent) entered these school tracks after primary school (see Figure 1). In the same period, the percentage of the pupils aged 13 attending lower secondary school (*Hauptschule*) or comprehensive schools (*Gesamtschule*) has decreased from 82 per cent in 1952 to 41 per cent in 1989. This educational expansion has resulted in the increase in educational opportunities, especially for girls, as well as in the qualificational upgrading of the population, but not in a remarkable decline of educational inequalities among social classes (Henz and Maas, 1995; Müller and Haun, 1994).[1] However, apart from structural and institutional effects, the educational opportunities of the offspring still depend on their social origin (Blossfeld, 1993).
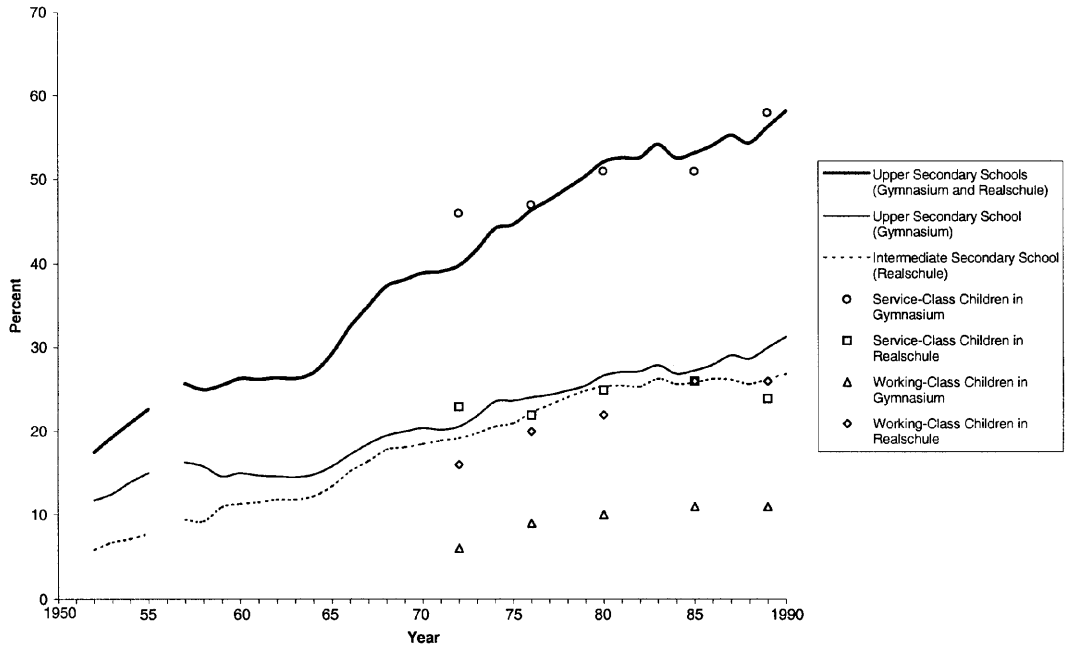
Figure 1. *Development of participation in secondary education in the Federal Republic of Germany, 1952–1990 – pupils aged 13 only*

Approximately 16 per cent working-class children aged 13 and 23 per cent of the service-class children in this age group attended intermediate school in 1972 (see Figure 1). Across successive birth cohorts the percentage of the working-class children in the intermediate school increased to 26 per cent in 1989, but the percentage for the service-class children increased to only 24 per cent. In the same time period the percentage of working-class children aged 13 entering upper secondary school rose from 6 to 11 per cent. However, in 1972, 46 per cent of the parents in the service class chose the upper secondary school for their children. By 1989 this percentage had increased to 58 per cent. This development illustrates that an increased number of transitions into the intermediate school track has improved the educational opportunities of working-class children. However, with regard to the relative increase in educational participation rates in upper secondary

school, the service class profited much more from the educational expansion than the working class (Mayer and Leschinsky, 1990; Blossfeld and Shavit, 1993).[2]

How can we explain the increase in educational participation rates since the 1950s? Is there an explanation for the persistent educational inequality among social classes? Apart from exogenous and endogenous causes and their interrelations, as well as the dynamics of the educational expansion itself, it is assumed that the increasing educational participation correlates with changes in the patterns of educational choices of parents at the end of their children's primary-school education. What we need is a theoretical explanation that indicates the significant mechanisms of both the parental choice of education and the realized transition from the primary school to the secondary school tracks.

Breen and Goldthorpe (1997) have offered such a coherent explanation. By applying rational action theory (RAT), they argue that the increase in general educational participation rates is interrelated with the declining costs of schooling and higher education provided that the preference for continued education has not declined (Breen and Goldthorpe, 1997: 294). Because educational credentials become increasingly important on entry to the the labour market as well as to secure privileged class position − this provides the net benefits of investments in education − the propensity for continued secondary and tertiary education has increased significantly. Breen and Goldthorpe (1997: 294) assume that as a consequence of the educational expansion itself education became a 'positional good' (Hirsch, 1995). Therefore, it is necessary for individuals to invest in their human capital continuously over their entire life course (e.g. Schömann and Becker, 1995). From the parents' point of view they have to invest in their offspring's education to secure their children's life chances and to reproduce their social status. This may be one of the main reasons why we observe increasing educational participation rates across successive generations and birth cohorts in most Western European countries.

Furthermore, Breen and Goldthorpe (1997: 294–295) stress that the decline in educational costs might have no effect on class-specific educational participation because it is similar for all social classes. Nevertheless, there are still significant differences among social classes in the increase in the positive assessment of educational benefits as well as the propensity to continue to invest in education. In spite of educational expansion and school reforms educational inequalities persist because the balance between benefits and costs remains constant among the social classes. Because the relation between the costs and benefits of education evaluated by parents has remained relatively constant within each of the social classes, the class-specific relationship between primary and secondary effects of social origin has not changed in spite of the general qualificational upgrading in the population (Goldthorpe, 1996: 492). These key mechanisms might explain persistent educational inequalities with regard to social origin and the intergenerational reproduction of educational opportunities.

It is the aim of the present paper to test empirically such a version of a rational-choice model of educational choices and, in particular, the mechanisms of the parental educational choices at the transition from primary to secondary school. First, utilizing such a theoretical model we seek to answer the question regarding the increasing participation in upper secondary school in West Germany. Secondly, we attempt to explain the persistent inequalities of education in West Germany despite the increase in educational participation rates by analysing the change in class-specific patterns of attendance at both the intermediate and upper secondary schools. The remainder of the paper will be structured as follows: in the second section a model based on the subjective expected utility theory (SEU), including the arguments of former rational-choice and action models, will be discussed; in the third section hypotheses will be derived from the applied SEU model; the fourth section provides the description of the data-set, empirical design, statistical procedure, and variables; the fifth section presents the empirical findings; followed by the conclusion in the final section.

Theoretical Background

Recently, Esser (1999) made some theoretical suggestions to explain persistent inequalities of educational attainment by class-specific educational choices. In his model based on the theory of subjective expected utility (SEU), Esser (1999) integrates the assumptions of the human-capital approach (Becker, 1993) as well as the similar rational-choice models by Boudon (1974), Erikson and Jonsson (1996), and Breen and Goldthorpe (1997).[3] Esser (1999) applies an initial SEU model to explain the mechanisms of parental educational choices at the end of primary school education. The parents have to decide between two alternatives: on the one hand, to continue on to lower secondary school (A_n), or, on the other hand, to continue on to intermediate or upper secondary school tracks (A_b). The consequences of each of the choices result in the expected utility EU. The amount of educational benefit B depends on the expected returns to the educational credentials on the labour market. Both, the expected costs of education C and the expected

amount of status decline SD are also key components of the parental calculations. The status decline results from the choice of an educational career that does not guarantee intergenerational status maintenance. Finally, the expected value P_{ep} indicates the expected probability of successfully completing the chosen school track, while P_{sd} indicates the impact of the expected probability of the status decline for sub-optimal educational choices on the parents' decision in favour of one of the school tracks.

When parents decide against the intermediate or upper secondary school the expected utility amounts to $P_{sd}(-SD)$, while the continuation of secondary schooling results in the expected utility value of $P_{ep}B + (1 - P_{ep})P_{sd}(-SD) - C$.[4] The estimated utility for each of the alternatives will then be:

$$EU(A_n) = P_{sd}(-SD)$$
$$EU(A_b) = P_{ep}B + (1 - P_{ep})P_{sd}(-SD) - C.$$

According to the logic of SEU theory the individual is assumed to choose the alternative with the highest expected utility EU (Esser, 1999: 269). Education will be continued when it is valid that:

$$EU(A_b) > EU(A_n) \text{ or } P_{ep}B +$$
$$(1 - P_{ep})P_{sd}(-SD) - C > P_{sd}(-SD).$$

This equation can be simplified to (Esser, 1999: 270):

$$B + P_{sd}SD > C/P_{ep}.$$

The term $B + P_{sd}SD$ defines the educational motivation of individuals. An increase in the motivation effect is more likely the higher the value of benefit as well as the greater the amount and likelihood of the status decline. The term C/P_{ep} indicates the investment risk. Provided that the cost is constant for all parents, the risk for investment in their children's education correlates with the expected probability of successfully completing their educational choice: the higher the expected probability of educational success is, the lower is the risk of continuing the child's education. Otherwise, the poorer the offspring's educational performances and academic abilities are, the higher must be the parents' motivation to choose upper secondary school.

For his explanation of class-specific educational choices, Esser (1999: 271) assumes that the value of both the benefits B and costs C are equal for all social classes. However, there are two problems with this explanation. First, it might be true that the loss of social status is lower for families at the bottom of the social stratification than for families in the upper and middle classes when they renounce continued education. Not choosing upper secondary school makes status decline more likely for families with high status than for working-class families. The educational motivation is therefore higher for upper social classes than for lower classes.

Secondly, the expectation of good educational performance is greater for the upper classes than for the lower classes. Therefore, the investment risk decreases with declining social status. In sum, Esser (1999: 271) makes intelligible the fact that the class-specific differences in both the educational motivation and investment risk cause educational inequalities among social classes. In particular, the class-specific differences in the expected probability of status decline P_{sd} as well as the probability of successfully completing the chosen school track P_{ep} are the main mechanisms of class-specific educational choices. Assuming that the expected benefits and costs vary significantly among social classes, these differences will persist. For example, Boudon (1974) stresses that individuals in lower classes tend to underestimate the benefits of continued secondary schooling or tertiary education as well as overestimating the costs of human-capital investments.

All in all, the model proposed by Esser (1999) includes the main arguments of previous rational-choice models of educational choice. However, in contrast to these other models, Esser examined the impact of status maintenance on educational choice (1999). He introduced an additional term into his SEU model that indicates the likelihood of status decline. In a theoretical sense, this means that individuals weigh the expected quantities of each of the benefits and the costs with the subjective likelihood of their occurrence. The SEU model was chosen for the empirical analysis used in this study primarily because of the addition of this theoretical extension. Furthermore, previous empirical analysis supports this decision (Becker 2000). The statistical fit of Esser's SEU model to empirical data was better than that of the other models, such as the model by Erikson and Jonsson (1996). In accordance with Boudon (1974) or Erikson and Jonsson (1996),

Esser (1999) assumes that parental resources have an impact on the actual and expected probability of a child successfully completing his or her educational choice. Privileged families are more likely to be able to compensate for unexpected failures by their financial, social, and cultural capital. For example, in contrast to families with low income, the richer families can employ a private teacher or place their children in boarding schools in order to improve their offspring's educational performance. Because of their experiences with their own educational career, qualified parents in higher social classes have the strategic knowledge to use educational opportunities in an efficient way. Therefore, they have lower opportunity costs than working-class families (Esser, 1999: 272).

Hypotheses

In order to derive hypotheses from the perspective of subjective expected utility theory we have to consider the societal, economic, political, and cultural changes in the post-war era. In the Federal Republic of Germany the modernization process, economic development, education policies, and the socio-cultural liberalization were important societal conditions for both parents' demand for continued education for their children and employees' demand for highly qualified manpower (Blossfeld, 1993). Parents' educational choices reflect their desire for upward social mobility through education to improve their children's social position and life chances in a socially stratified society such as that of West Germany (Müller, Jonsson, and Mills, 1996). Therefore, when there is a social inequality of resources and opportunities, investment in education is rational for parents who seek to realize their own interest in social status as well as benefits for their children (Müller and Karle, 1993). It is rational to invest in children's education because both the education and the certificates are necessary for occupational allocation and status attainment (Erikson and Goldthorpe, 1992). Investment into their children's human capital is based on the parents' calculations of benefits. The increasing demand of employers for qualified manpower in both the private and public sectors (Becker and Blossfeld, 1991) indicates the increased instrumental function of education for occupational allocation, status attainment, and earnings (Hannan, Schömann, and Blossfeld, 1990; Carroll and Mayer, 1986). Empirical analysis can determine whether parents' motivation towards status attainment and intergenerational status reproduction, and the instrumental benefits of education perceived by the parents in their children's educational choices, has increased over time, while the perceived costs of long-term human-capital investment has declined.[5]

Thesis of instrumentalization of upper secondary schooling

The instrumental utility of continued education in the upper secondary school expected by parents has increased in the post-war period. Because of the increase in the demand for qualified workers on the labour market it is rational to invest in human capital. Therefore, an increasing impact of expected benefits (B) on educational choice should be expected.

Thesis of cost–benefit relationship

The relative increase in choices to continue on to upper secondary schooling is based on the increased significance of a positive assessment of benefits (B) and parental educational motivation ($B + P_{sd}SD$) as well as on the decreased impact of both the subjective expected costs (C) and the investment risks (C/P_{ep}) on educational propensities.

Thesis of intergenerational status reproduction

Because of the increase in educational participation rates, the inflation of educational credentials, the processes of qualificational displacement in the course of increased competition in labour markets, and declining returns to human-capital investments, the continuation of education has become an important factor in improving intergenerational status reproduction. Therefore it is assumed that the expected amount of status decline SD for sub-optimal educational choices has an increasing impact on educational choice. The motive of intergenerational status maintenance might be significant for parents who have already profited from the educational expansion themselves. For the educational transition

it is assumed that parents' education affects their children's educational opportunities. The higher the parents' educational level the more likely it is that their children will enter the *Gymnasium*.

Thesis of decreased educational costs

Due to increased prosperity and diffusion of knowledge about both the utility of educational credentials and educational opportunity, the subjectively assessed costs of educational choices (*C*) have decreased across cohorts. The lower the actual and expected costs are, the higher is the propensity to continue on to higher education.

Thesis of persistent inequalities of educational opportunity

The educational expansion is correlated with the decreasing impact of both the primary and secondary effects of social origin on the transition to the higher school tracks. However, with regard to these origin effects, the differences among the social classes have not changed significantly. The more significant the class-specific differences in the balance of these origin effects remain over time, the more likely is the persistence of inequalities of educational opportunity.

Database, Statistical Procedure, and Variables

Database

The empirical analyses are based on the data-sets of three different surveys conducted in several federal states of the Federal Republic of Germany in the years 1967, 1971/2, and 1982/3. In the first survey, the data of 1,729 parents of pupils in Baden-Württemberg (a federal state in the south-western region of the Federal Republic of Germany) were collected in 1966/7 (Baur, 1972). In autumn 1967 the pupils changed from the fourth class in primary school to the fifth class in one of the three secondary school tracks (*Hauptschule*, *Realschule*, or *Gymnasium*). The second data-set contains information about 1,348 families in North Rhine Westphalia (*Nordrhein-Westfalen*) having children in the fourth or fifth class (Fröhlich,

1973). In working-class families the spouse was also interviewed. Therefore, it is possible to compensate for the non-response of one of the spouses, missing values, and the under-representation of blue-collar workers. The data for this second set were collected between November 1971 and May 1972. The third data-set includes information on 3,085 parents in Baden-Württemberg, North Rhine Westphalia, Lower Saxony (*Niedersachsen*) and West Berlin (Fauser, 1983; Fauser, 1984). In autumn 1982 they were interviewed about their educational motivation and propensity to place their children in secondary schools. In autumn 1983 information pertaining to the completed transition into the secondary school tracks was collected.

Families opting for the comprehensive school, or cases with missing values for educational aspirations and other important variables, are excluded from the analyses. The sample for the period 1966–7 contains 1,685 families. For the 1970–1 period we have information about 1,840 families and finally, the sample for the 1982–3 period includes valid data for about 1,964 families. Existing data-sets are insufficient to describe the total post-war period in detail, and only these three points in time are available to us. The employed databases allow us to analyse the causal mechanisms of the process of educational choices in families; having information for two points of time enables us to reconstruct the total process of both the educational choice and the realized transition. However, it has to be considered that the variation of parental choice of education and its realization through time could be conflated with differences of survey design and population for each of the points in time. This assumption might be theoretically plausible, but it has not been confirmed empirically. Furthermore, we have no idea why the process and mechanisms of both the parental choice and the educational transition should vary across the federal states of West Germany. For the empirical analysis, the data are sub-optimal, but to our knowledge there is no alternative data-set for Germany.

Design, Statistical Procedure, and Dependent Variables

As presented in Figure 2, the multivariate analyses will be employed in three steps. The first step is the
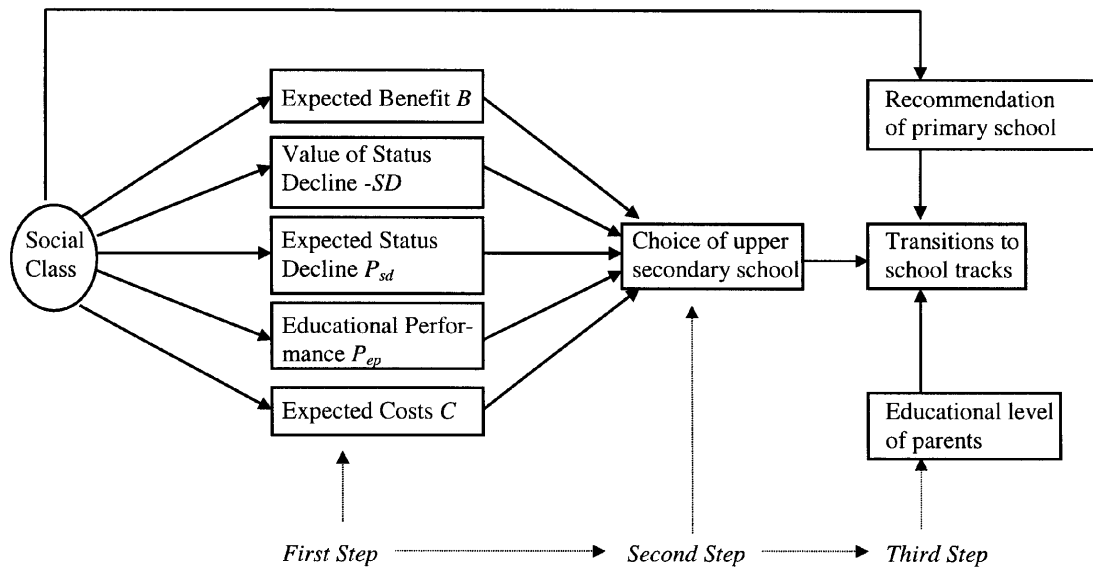
Figure 2. *Design of empirical analysis*

preparation of actual estimates of both the parental educational choice (second step) and the realized transition to the various tracks in the secondary school (third step). First, the impact of social class on each of the determinants of parental educational choice is estimated.[6] The class differences in the dependent dummy variables 'expected benefit', 'expected value of status decline', 'expected probability of status decline', 'expected probability of successfully completing of the educational choice', and 'expected costs' are estimated by probit regression (Aldrich and Nelson, 1984).[7] These estimates are documented in Tables A.1–1 to A.1–3 (presented in the Appendix). The estimated results of each of these variables are stored as the so-called inverse of Mill's ratios (IMR) (Greene, 1995: 640).[8] Thus the initial dummy variables such as the expected benefit of education, the expected value of status decline, the expected probability of status decline, and the expected probability of successfully completing the educational choice are transformed to metric instrumental variables (Heckman, 1997). They then indicate the class-specific determinants of educational choices.

Secondly, we investigate the impact of social class on the recommendation of the primary school for the tracks in the secondary school. The results of these estimations are also stored as instrumental variables. In the third step they will be used as independent variables, such as the class-specific recommendation for the estimations of the realized transitions to one of the three secondary school tracks. These estimates are documented in Tables A.2–1 to A.2–3 (presented in the Appendix).

In the second step we analyse the mechanisms of parental educational choice by utilizing the SEU model of parents' educational choice of upper secondary school. The dependent variable of the second step is the rational choice to continue on to the upper secondary school (*Gymnasium*). It is measured as a dummy variable (1=choice of upper secondary school and 0=choice of lower or intermediate secondary school). In this step the metric instrumental variables – the class-specific expected benefit of education, the expected value of status decline, the expected probability of status decline, and the expected probability of successfully completing of the educational choice – stored from the previous step, are integrated into the probit regression equation as independent variables (Heckman, 1979; Heckman, 1997). The result of the parental choice of upper secondary school estimated

in the second step will also be stored as an instrumental variable.

In the third step, the instrumental variable 'parental choice of upper secondary school' stored in the second step is included as the indicator of the class-specific educational choice. The dependent variable in the third step is the likelihood of the transition to one of the three secondary school tracks and it is coded as a categorical variable (0=transition to lower secondary school, 1=transition to intermediate secondary school, and 2=transition to upper secondary school). Multinomial logistic regression is used to investigate the actual educational transition. For the analysis of the realized educational choice the impact of the parents' former educational choice, their experience of the educational system, and the institutional effects – e.g. the class-specific recommendation of the primary school (see the first step) – were considered.

This applied complex procedure corresponds to the logic of the two-step procedure suggested by Heckman (1979) to control for sample selection bias (Winship and Mare, 1992). We take the view that this two-step design is an efficient procedure that reduces complexity and is appropriate to the causality and endogeneity of both the educational choice and the actual realization of the educational choice (Schömann and Becker, 2001).

Independent Variables

As is the case with many other secondary analyses, our databases do not provide for the optimal operationalization of the variables. Therefore, we make use of proxy variables that are coded as dummy variables. However, the operationalization of some of the explanatory variables is different for each of the points of time, thus the results of the historical comparison must be interpreted carefully.

One of the most important variables is the benefit of education. The benefit is coded '1' if it is assumed that the upper secondary school certificate (*Abitur*) or university study is necessary to realize occupational opportunities or status attainment in the future, and zero if this assumption is not made.

Another variable is the value of status maintenance. For the 1960s this variable is measured by the positive discrepancy between the occupation of the head of household and the occupation anticipated for the offspring. If the parents are interested in their children's upward mobility, the variable has the value '1'. For the 1970s it is indicated by the assessment of the educational affinity of the middle and upper classes. The variable is coded '1' when the parents share the higher social classes' educational affinity. For the 1980s the value of status reproduction is operationalized by the parental desire for an educational certificate for their children that is higher than the parents' education. When the parents desire a higher credential for their children, the variable is coded '1'.

The measure of the expected probability of status decline is different for each of the points in time because of the different aim of each of the surveys: the 1966–7 survey was a subjective assessment of the impact of education on social status; the 1970–1 survey measured attitudes to insurmountable barriers between social classes; and the 1982–3 survey attempted to show whether parental desire for an educational certificate for their offspring was lower than parental credentials.

Costs are measured differently in each of the three time periods. In the 1960s parents were asked if they often have to worry whether they would still have enough money at the end of the month (coded '1' for a positive response and '0' for a negative response). At the beginning of the 1970s the parents were asked if the transition to intermediate or upper secondary school would result in their having to make economies in their spending (coded '1' for the answer 'yes' and zero for 'no'). For the 1980s the expected costs were determined by the number of the children living in the household: families with two or more children at school were coded by '1' and families with one or no child of school age were coded zero.

The expectation of success in completing the educational choice (educational performance) is measured by the children's educational performance and academic ability. When possible, a subjective assessment of children's problems or performance in school has been used ('Yes, my child is a good pupil and could complete *Realschule* or *Gymnasium* successfully'). However, for the 1980s the offspring's actual performance is measured by their average academic ability in mathematics, grammar, and German language as assessed by the teacher. This

variable was measured by comparing the level of each pupil's performance to the average performance. For the analyses of the realized transition the recommendation of the primary school and the credentials of the parents are included as dummy variables.

Empirical Findings

The Change in Educational Choices of Upper Secondary School

The class-specific educational choice of parents at the end of primary schooling is the precondition for their children's educational participation in secondary school as well as an important cause of the inequalities of educational opportunities. The class-specific changes in parental choice of education result in variations of both participation rates and educational inequalities over time. Therefore, we investigate the determinants of the educational choice of upper secondary school and its changes across cohorts. Table 1 presents the empirical estimates of the mechanisms of parental choice of upper secondary school. These mechanisms are indicated by the expected benefits of education, the expected value of status decline, the expected probability of status decline, and the expected probability of successfully completing the educational choice specific for each of the social classes. The results confirm the basic SEU model of educational choices provided by Esser (1999).

The impact of the expected benefits B on educational choice has increased slightly across cohorts of pupils and parental generations. In accordance with the human-capital approach, the expected professional usability of continued education in upper secondary school (and then at university) might be becoming more important. However, this interpretation has to be limited due to additional analysis testing the statistical significance of the change in the expected benefits. On the one hand, the influence of the expected benefit on educational choice increased significantly between 1966 and 1977, but on the other hand this was not true for the period up to 1982. Such an evolution is plausible because of the deflation of human-capital investment during the educational expansion (Hannan, Schömann, and Blossfeld, 1990). Since the 1980s investment in

continued education has obviously been necessary, but not sufficient to realize the expected benefits of education. These findings do not provide strong confirmation of the thesis of the instrumentalization of continued education.

Because of this development it is assumed that the motive of status maintenance has become an increasingly important mechanism for educational choice. Indeed, the impact of the expected value of status decline (*SD*) on educational choice of the upper secondary school (*Gymnasium*) has increased over time.[9] This finding confirms the thesis of intergenerational status reproduction. It has been argued theoretically that the qualificational upgrading across generations has resulted in an increasing propensity towards upward mobility. Furthermore, the inflation of credentials has increased the likelihood of expected status decline when choosing the lower secondary school or intermediate secondary school. It has also forced the likelihood of optimal educational choices in securing social status. Therefore, with respect to intergenerational status reproduction, the instrumental value of education in upper secondary school has increased for families in the middle classes. It is assumed that the dynamics of the educational expansion itself has strengthened this remarkable evolutionary development. The increasing educational participation in the course of the educational expansion 'enforces' educational choices appropriate to maintain the social status across generations. For parents in higher social classes there is a commitment to continue traditions in their offspring's education, to maintain class-specific living standards, and to realize class-specific behaviour (see Tables A.1–1, A.1–2, and A.1–3 in the Appendix). These findings support the thesis of intergenerational status reproduction in favour of the thesis of the professional benefits of continued education. However, these mechanisms of educational choice improving over time might be one of the important causes of the persistent inequality of education among social classes.

The impact of the expected costs on educational choices has decreased significantly across cohorts. Such a change confirms the thesis of decreased educational costs. It is assumed that the impact of expected monetary and opportunity costs has declined because of the increased prosperity in all social classes, and the diffusion of knowledge

Table 1. *Estimates of the propensity to continue on to higher levels of education: the choice of upper secondary school* (Gymnasium)

	1966	1966	1970	1970	1982	1982
Constant	−0.720***	−0.672***	−0.636***	−0.614***	0.291***	0.368***
	(0.035)	(0.033)	(0.033)	(0.032)	(0.030)	(0.030)
Benefit B	0.093*		0.096*		0.111**	
	(0.046) [1.074]		(0.044) [1.072]		(0.038) [1.092]	
Value of status decline	0.306***		0.372***		0.649***	
$-SD$	(0.070) [1.482]		(0.043) [1.340]		(0.049) [1.220]	
Expected probability of	0.208***		0.153***		0.235***	
status decline P_{sd}	(0.049) [1.150]		(0.041) [1.119]		(0.060) [1.179]	
Expected educational	0.341***		0.485***		0.365***	
performance P_{ep}	(0.048) [1.302]		(0.064) [1.335]		(0.039) [1.330]	
Expected costs C	−0.197***		−0.165***		−0.092*	
	(0.054) [0.874]		(0.041) [0.877]		(0.040) [0.933]	
Educational motivation		0.093**		0.203***		0.316***
$B+P_{sd}SD$		(0.037) [1.087]		(0.035) [1.204]		(0.028) [1.414]
Investment risk		−0.053†		−0.031***		−0.176*
C/P_{ep}		(0.031) [0.943]		(0.007) [0.882]		(0.079) [0.936]
Pseudo-R^2	0.079	0.005	0.007	0.003	0.010	0.005
Degrees of freedom	5	2	5	2	5	2
Number of cases	1685	1685	1840	1840	1964	1964

Notes: The results reported are from a probit regression. Standard errors of non-standardized coefficients are presented in parentheses; the standardized effects coefficients are presented in square brackets.

p ⩽ 0.05; ** p ⩽ 0.01; *** p ⩽ 0.001; †p ⩽ 0.1

Sources: (1) 1966–7: ZA-Survey 893: *Elternhaus und Bildungschancen* − author's calculations;
  (2) 1970–71: ZA-Survey 819: *Chancenzuweisung durch Ausbildung* − author's calculations;
  (3) 1982–3: ZA-Survey 1611: *Bildungsverläufe in Arbeiterfamilien* − author's calculations.

about both the utilities of educational credentials and educational opportunities. Because of the decreased costs more and more parents tend to choose the higher school tracks for their children's education. This might also be true for the social classes that had reservations about the *Gymnasium* because of the expected cost.

Finally, we look at the relationship between benefits and costs and its change. The relationship between benefit B and cost C has remained quite constant across cohorts. However, the impacts of both the parental educational motivation $B+P_{sd}SD$ and the investment risk C/P_{ep} have increased significantly in the period between 1960 and 1980. These results also confirm the thesis of changes in the cost−benefit relationship and explain the increase in the choice of upper secondary school after primary school. However, how can we explain such a development? This development is an expression of persistent social inequality among social classes. It reflects variations in the class-specific expectations over time for each of the elements of the parental

educational motivation as well as the expected investment risk.

The estimates of the first analytical step presented in Appendix Tables A.1–1 to A.1–3 confirm the thesis of persistent inequalities of educational choice being one of the significant preconditions of inequalities of educational opportunity. In the course of educational expansion little change has occurred in the determinants of educational choices among social classes. For the desired educational career, the benefits, the status maintenance, and the division between the lower and higher social classes has shifted to the craftsmen, Polish, and unskilled white-collar employees. Differences among social classes with respect to both educational performance and the expected costs of education have also changed, but to a lesser degree. This means that the increase in educational choice of upper secondary school (*Gymnasium*) is, in particular, correlated with changes in the expectations of the middle and upper classes. The decrease in the educational inequality within the working class is an effect

Table 2. *Estimates of the determinants of the transition to the intermediate and upper secondary school tracks − multinomial logit regression*

	1967 *Gymnas.*	1967 *Realsch.*	1972 *Gymnas.*	1972 *Realsch.*	1983 *Gymnas.*	1983 *Realsch.*
Constant	0.323†	0.369*	− 1.489***	− 1.801***	0.984***	1.203***
	(0.187)	(0.164)	(0.084)	(0.100)	(0.145)	(0.143)
Parental decision						
Gymnasium	− 1.359***	3.184***	0.510***	2.092***	0.278*	1.754***
	(0.378)	(0.261) [9.57]	(0.120)	(0.109) [4.56]	(0.130)	(0.137) [3.76]
Socio-cultural background: education of parents						
Intermediate cert	− 0.034	0.853**	1.300***	1.592***	0.546*	0.968***
(*Mittlere Reife*)	(0.241)	(0.301) [1.36]	(0.247)	(0.253) [1.58]	(0.228)	(0.230) [1.53]
Upper sec. cert.	0.173	2.122***	0.888**	2.094***	0.554	2.196***
(*Abitur*)	(0.370)	(0.378) [2.01]	(0.326)	(0.272)[1.80]	(0.324)	(0.302) [2.57]
Recommendation of primary school for . . .						
Intermediate level	1.864***	0.423**			1.570***	0.4644***
(*Realschule*)	(0.106)	(0.183) [1.38]			(0.117)	(0.1352) [1.42]
Upper sec. level	1.244***	2.896***			1.212***	2.098***
(*Gymnasium*)	(0.159)	(0.179) [10.11]			(0.158)	(0.158) [5.10]
Intermediate/upper secondary level			0.919***	1.032***		
			(0.089)	(0.100)		
Pseudo-R^2	0.537		0.292		0.396	
Degrees of freedom	10		8		10	
Number of cases	1685		1840		1964	

Note: Standard errors of the coefficients are given in parentheses; standardized effects coefficients are given in square brackets.
p ⩽ 0.05; ** p ⩽ 0.01; *** p ⩽ 0.001; †p ⩽ 0.1.
Sources: (1) 1966–7: ZA-Survey 893: *Elternhaus und Bildungschancen* − author's calculations
   (2) 1970–1: ZA-Survey 819: *Chancenzuweisung durch Ausbildung* − author's calculations
   (3) 1982–3: ZA-Survey 1611: *Bildungsverläufe in Arbeiterfamilien* − author's calculations

of their increasing choice of the intermediate school track (*Realschule*).[10] These relationships explain the so-called 'elevator effect' of the educational expansion as well as the observed increase in social homogeneity of socially disadvantaged pupils in the lower secondary school (see Mayer and Blossfeld, 1990; Leschinsky and Mayer, 1990).

The Change of Educational Transitions to Upper Secondary School

There are often discrepancies between educational choices and the realization of educational decisions at the transition from primary school to upper secondary school tracks (Jürgens, 1989).[11] On the one hand, the realization of parental choices could be constrained by institutional rules, e.g. the recommendation of the primary school for one of the secondary school tracks. On the other hand, depending on their resources and abilities, some of

the parents are able to push through their educational choices. In particular, parents who themselves have higher educational qualifications seek to register their underachieving offspring at the *Gymnasium* against the primary school's unfavourable recommendation. Some of the parents with lower educational qualifications place their children in the lower secondary school in spite of their children's positive performance or the positive recommendation for the intermediate or upper secondary school. Therefore, it is necessary to compare the impact of both the parents' educational choice and the institutional rules on the actual transition to one of the school tracks.

On the one hand, the parental educational aspiration for the *Gymnasium* has increased across cohorts, but on the other hand, the impact of their educational choice of the highest school track (*Gymnasium*) on the realized transition to *Gymnasium* has decreased. This seems paradoxical. The influence of the educational intentions' threshold value

has obviously declined because the provision of upper secondary schools has increased greatly due to the building of new schools and employment of more teachers. Participation in upper secondary school has therefore become much easier. The reduction in regional inequalities in the demand for education has also motivated parents who previously held reservations about continued education to enrol their children in the *Gymnasium*. This means that parental educational intention is a necessary condition for the transition to higher school tracks, but it is not sufficient to explain the entire process of educational career choice, nor the persistent inequalities in education. Of course, alternative tracks must be offered by the educational system in order to provide choices to parents and their children. In sum, these findings support our hypothesis that the increase in educational participation rates is based on both exogenous and endogenous factors, as well as the institutional rules and structure of the education system (Allmendinger, 1989). Regarding the change of the sign of the coefficients of the educational intention across cohorts, it is assumed that some of the parents who prefer the *Gymnasium* consider the intermediate school track (*Realschule*) to be the second best option. However, parents with significant educational aspirations do not consider the lower secondary school (*Hauptschule*). Compared with the educational performance of their children it is possible that an increasing number of parents have had exaggerated aspirations. This could be another explanation of the 'paradox' described above.

The significant impact of the parents' education on the offspring's transition to the intermediate or upper secondary school has remained relatively constant in the course of the educational expansion (Blossfeld, 1993; Mayer and Blossfeld, 1990). Despite the educational expansion, children of parents with high qualifications still have favourable educational chances. According to the thesis of the boomerang effect of the educational expansion, pupils of parents who have profited from the educational expansion themselves are more likely to enter upper secondary school than children of parents with lower educational credentials (Mayer, 1991). However, these effects of intergenerational reproduction of education should not be over-estimated. The standardized odds ratios show that the primary and

secondary origin effects are more likely to be responsible for the parental choice of education and the realized transition to the tracks in secondary school.

Finally, the impact of the primary school's recommendation on the likelihood of entering upper secondary school has decreased. This means that the impact of both the secondary origin effect (parental choice of school track) and the primary origin effect (school performance evaluated by the primary school's recommendation) on the transition to the *Gymnasium* has weakened. However, when we distinguish between the types of recommendation, it is obvious that the impact of the recommendation for intermediate secondary school on the transition to this track has decreased, but it has increased for the transition to upper secondary school.

Some parents attempt to defend their educational choices of *Realschule* and *Gymnasium*, in particular, from actual upward mobility in the hierarchy of the educational system by correcting an unexpected recommendation. The empirical study by Jürgens (1989) shows that the qualified parents' assessments of their children's performance fit much better with the children's actual academic ability than do the assessments of the teachers in the primary school.[12] This corresponds with the boomerang effect thesis that parents who have profited from the educational expansion also have the strategic competence and knowledge to defend their aspirations and life-plans from unexpected constraints. It seems to be obvious that the dynamics of the educational expansion itself have had an impact on both the educational choices of individuals and the realization of anticipated educational participation.

Therefore, the thesis regarding the consequences of the dynamics of the educational expansion itself suggested by Goldthorpe (1996) is confirmed by our findings. Supporting evidence is provided by the standardized odds ratios. The quantitative ratio between the primary origin effects indicated by the recommendation by the primary school for *Gymnasium* and the secondary origin effect has increased, and the impact of the primary origin effect (the effect of the pupils' school performance depending on their social origin) on the realization of educational opportunities has become stronger than the secondary origin effect. The increasing disparities between the primary and secondary origin effects have resulted in the persistence of inequality

of educational opportunity on the one hand, as well as in the increasing differences between the lowest and the highest social classes on the other.

Conclusion

It was the aim of the paper to investigate the social mechanisms of the educational choice empirically in order to provide an explanation of educational expansion and the persistence of educational inequalities. The expanding educational participation rates in the upper secondary school in the Federal Republic of Germany required analysis in order to determine whether these were based on changes in parental educational choices. The persistence of educational inequalities among social classes also required examination through an analysis of both the educational choice and the realization of the educational choice. In the theoretical part of this paper, we argued that the increase in the supply of educational opportunities is a necessary condition for the increasing demand for education, but the change of parental calculations of cost and benefits of human-capital investment would be the decisive mechanism. Hypotheses were derived by applying the model of subjective expected utility (SEU) provided by Esser (1999). This SEU model incorporates the arguments of other rational-choice models into a coherent model explaining educational choices. According to the SEU theory, educational choices are based on utility-maximizing calculations of the costs and benefits of continued education. The assessment of alternative educational careers and the expectation of costs and the probability of successfully completing one of these alternatives are important mechanisms in the decision-making process of parents. Breen and Goldthorpe (1997) have argued that the persistent inequality of education can be explained by this approach. The assessment of the costs and benefits of human-capital investment differ for each of the social classes, resulting in the inequality of education. Because the relationship between the costs and benefits of education has remained constant among the social classes, the educational expansion and school reforms have not resulted in the decline of social inequality. In this paper Breen and Goldthorpe's argument has been tested empirically for

West Germany at three points in time in the 1960s, 1970s and 1980s in terms of the processes of educational choice and the realization of the chosen alternative taken from surveys in 1966–7, 1970–1 and 1982–3.

The applied SEU theory of educational choice explains sufficiently the change of educational participation rates in the post-war period as well as the persistence of educational inequality among social classes. However, more points in time are needed to substantiate our results as well as to be sure that we have not detected a historical coincidence but social regularities and patterns of social change. The neglect of additional points in time makes it risky to speak about causalities confirmed empirically.

There are additional reasons to collect data about other points of time. First, we have neglected many exogenous factors of the educational expansion possibly responsible for the changing educational participation. In our models there were societal changes at the macro level, such as demographic change, the demand for qualified workers, the extension and reform of the educational system, the increase of prosperity in the population, a publicity campaign by the state, the inflation of credentials and decreasing returns to human-capital investments, which, in our view, have not been controlled explicitly in our multivariate analysis. If we were not able to control the change of constraints and opportunities which influence the individuals' definition of their social situation and their selection of alternatives then we would face serious theoretical problems. In this case the rational-choice theory and the derived hypotheses remain rather tautological because empirical studies demonstrate that parents and their children observe changing labour markets carefully and react very sensitively to changes in the demand for educational credentials (see Blossfeld, 1996).

Secondly, in our investigation we found evidence that unobserved endogenous factors, as well as the structure of the educational expansion and its own dynamic, have to be considered when explaining the educational choices of individuals and individuals' educational participation. The analysis of these explanatory macro-variables would contribute to explaining changes in the expected costs and utilities of education. Therefore, in future we need

periodical collection of data regarding the mechanisms of individuals' educational choices.

Thirdly, we sought to answer the question about inequality of education, which persists despite educational expansion and other school reforms. To do this we made use of the explanation by Breen and Goldthorpe (1997). It is an intentional consequence of the educational expansion that educational opportunities have been improved for all of the social classes, but in spite of this development the class-specific balance of evaluated costs and benefits has remained constant across cohorts. Because the relationship between subjectively expected costs and benefit is still constant in all social classes, the so-called elevator effect of educational upgrading has resulted in a constant balance of primary and secondary effects of social origin (Goldthorpe, 1996: 492). Social inequality has been reproduced by both the rational adaptation of resources, opportunities, and constraints, and the intergenerational reproduction of educational chances. On the one hand, our empirical analyses demonstrate that the relationship between costs and benefits has changed across cohorts. In particular, offspring in the higher middle classes have profited from this evolution because the impact of the cost has decreased so much that the impact of the entire investment risk has also decreased for pupils with low educational performance. In the case of minor increases in educational motivation, the decrease in investment risk has resulted in a level of higher educational participation by the middle classes. Both the upper and middle classes have to invest in their children's education due to the inflation of credentials as well as the strengthened competition of qualified first-time employee at entry to the labour market. Therefore, human-capital investments certainly become sufficient to reproduce social status, but recently it has been necessary to invest in education to prevent downward mobility across generations.

On the other hand, we found some evidence for an increasing polarization of the cost–benefit relationship among social classes. The conditions for the lower working class have become worse for the following reasons: First, their educational aspirations have hardly increased. Secondly, their pessimistic evaluation of the costs of education has not changed. Thirdly, the primary effects of social origin still have negative impacts on their school performance. In terms of educational participation, the social distance between the working class and the service class has become greater since 1983.

Finally, analysing the realization of parental choice of education by the transition to different school tracks after primary school we found that the impact of mechanisms responsible for the inequalities of educational opportunity has changed across cohorts. On the one hand, there has been a decrease in the inequality of educational opportunity by both the parental choice of education (secondary effect of social origin) and the recommendation for the higher school tracks such as *Gymnasium* (primary effect of social origin). However, on the other hand, we found that in spite of this evolution during the educational expansion the recommendation for the higher school track, which indicates the teacher's evaluation of the pupil's prior and future school performance, has become more important for the realization of educational opportunities than parental choice. This might be a cause of the educational expansion in its initial period, as well as a self-strengthening effect of the dynamic of the educational expansion in later periods. More important is the empirical finding that the inequality of educational opportunity is persistent because the social inequality of receiving a favourable recommendation for the *Gymnasium* has increased across cohorts to the disadvantage of the lower working-class, while the quantitative role of educational choice for the transition has diminished over time. However, we have provided empirical evidence that the children's school performance affects parental choice significantly. In spite of, as well as because of, the educational expansion in West Germany, the change in the balance between the primary and secondary effects of social origin has contributed to the persistence of social inequality of education as well as to the increased polarization of educational opportunities among the higher social classes and the lower working-class.

Notes

1. The increased educational participation of girls could be explained by the following causes determining parental educational choices (see also Jonsson, 1999).

Because of growing prosperity the impact of costs on educational choices has diminished, but the relative opportunity costs of human-capital investments were constant due to women's relatively lower income. The comparison of the educational performance of both the girls and boys provides that the transaction costs are lower for girls due to their advanced academic ability. However, human-capital investments in girls become more important to secure their chances on the labour market as well as on the marriage market. The educational homogeneity in partnerships confirms this conclusion.

2. The increase in educational participation rates in all social classes was interrelated with the increasing opportunities to attend upper secondary school. This development has resulted in social homogeneity among pupils at the *Gymnasium*. However, at the same time social heterogeneity has increased in the Realschule and *Hauptschule* attended mainly by the lower classes (Leschinsky and Mayer, 1990: 26). An unintentional consequence of the educational expansion is the growing social distance between the social groups with higher and lower educational credentials.

3. Breen and Goldthorpe (1997) integrate theoretical arguments of the human-capital approach (Becker 1993), the model by Boudon (1974), as well as the explanation by Erikson and Jonsson (1996) into their sophisticated rational-choice model. For the explanation of class-specific educational choices they stress – like Boudon (1974) – the consequences of the primary and secondary effects of class of origin. With respect to educational choices the differences among social classes depend on three mechanisms. First, the role of risk aversion – the motive of status reproduction which varies among the social classes – has been stressed by Breen and Goldthorpe (1997). Higher social classes avoid educational choices that result in social downward mobility, while for lower classes the same choice could result in lateral or upward mobility. Secondly, educational choices depend on social class because of class-specific educational performance and the offspring's academic abilities (the primary effect of social origin). The higher the family's social status is the better their children's performance will be. Thirdly, class-specific educational choices correlate with parental resources (the secondary effect of social origin). In contrast to the model by Boudon (1974) or by Erikson and Jonsson (1996), Breen and Goldthorpe (1997) argue that class-specific risk aversion is the decisive mechanism which results in educational inequalities. This risk aversion will be modified by expected costs and the expected probability of successfully completing the educational choice.

4. In Germany students interested in participating in higher education must successfully finish the upper secondary school with the *Abitur*. Such a certificate entitles the students to further their studies at university.

5. Of course, there are several other reasons for the described development. They could be differentiated into exogenous and endogenous factors of educational expansion. Important exogenous factors are: demographic development of cohort size; the demand for manpower in several labour markets; the necessity of higher education to get a job; the increase in income among private households as well as in private welfare; and the extensions of the education system and its institutional reform. The most important endogenous factors are: the change in educational aspirations; the educational choices in the course of generations and the intergenerational reproduction of education; the social diffusion of knowledge about the instrumental significance of advanced education; and the increasing importance of education for parents' planning of their children's life courses (e.g. Diekmann, 1982). Finally, the dynamics of the educational expansion itself lead to the increase of both educational aspirations and participation in higher education. On the one hand, the state or the government itself, which has initiated the educational expansion, has absorbed the occupational beginners to solve its own demand for highly qualified manpower. On the other hand, there is an increasing demand for higher education because parents who have already profited themselves from the educational expansion want their children to also succeed in higher education. Therefore, it could be assumed that the increase in participation in higher education is the combined result of the increasing significance of status reproduction, status attainment, and educational aspiration across generations.

6. Social class is measured by the occupational status (*berufliche Stellung*) of the head of the household. Alternative operationalizations – e.g. the Erikson–Goldthorpe categories (Erikson and Goldthorpe, 1992) or schemes which differentiate between lower, middle, and upper class – result in reduced complexity but they do not consider social heterogeneity within these categories. Terms like 'the working class' or 'the service class' are too simple. Therefore, we use the occupational status scheme, which provides a comparison with other studies.

7. In addition to statistical distribution, there are also theoretical reasons to choose the probit or logistic regression (Urban, 1993: 108). As seen above, it is possible to describe the process of educational choice by theories of social action, rational choice, expected utility, or utility optimization. Our stochastic decision and action model can be combined with the logic and statistics of the probit or logit models (Urban, 1993: 119).

8. The inverse of Mill's ratio (IMR) is usually considered in multivariate analyses of income distribution. It is included as an independent variable to control for sample selection bias (Vella, 1998; Becker and Schömann, 1996; Angrist *et al.*, 1996; Dubin and Rivers, 1989). In our case we employ the Heckman procedure to control the class-specific selectivity of the explanatory variables. From a theoretical point of view, the IMR is a metric instrumental variable to indicate the causal impact of class-specific resources, conditions, and constraints on subjective expectations, assessments, rational choices, and life chances of children. This is rational because it is often impossible to observe the mechanisms directly (Hedström and Swedberg, 1996). We assume that social selectivity of the definition and evaluation of the social situation have an impact on the resulting educational choice (Becker, 1998). In this respect, by applying the stepwise Heckman procedure the probability of educational choice is 'weighted' by the social selectivity. From the methodological point of view the following aspects are considered separately: (1) the unobserved heterogeneity based on the interrelation between social class and social action; (2) the social selectivity of resources, educational preferences, and educational performance among social classes; (3) the social selectivity of the evaluation of the costs and benefits of continued education; and (4) the problem of causal inference in the decision process (see Manski, 1993).

9. While the increase in the amount of expected status decline is significant and linear from point in time to point in time, the impact of the expected probability of the status decline for sub-optimal educational choices on the parents' decision in favour of one of the school tracks (p_{sd}) has declined from 1966 to 1970 and then increased again up to 1982. Only the differences between the 1960s and the 1980s are statistically significant. The standardized effect coefficients indicate that the amount of status decline is more influential than the expected likelihood of status decline.

10. In the course of institutional reforms the equalization of the duration for obtaining the lower or intermediate secondary school certificate might lead to the unintentional effect that the significance of the lower secondary school level (*Hauptschule*) has declined dramatically. Because of the decline in the cost of attending *Haupt-* or *Realschule*, an increasing number of families in lower social classes have chosen the intermediate secondary school level (*Realschule*) (Müller and Haun, 1994).

11. Consider Tables A.2-1 to A.2-3 in the Appendix. The real transitions at the end of the primary school specific for each of the social classes confirm the following conclusion by Leschinsky and Mayer (1990). In the course of the educational expansion, educational opportunities have improved but the inequalities among the disadvantaged classes have strengthened. In 1967 the likelihood of changing to the *Gymnasium* was eight times higher for the children of managerial employees than for the children of unskilled workers (see Table A.2-1). This likelihood increased until the 1980s (1971: 14 times and 1983: 22 times). The same development of increasing inequality has occurred among the children of civil servants and professionals to the disadvantage of the children of unskilled workers (see Tables A.2-2 and A.2-3). Therefore, the social heterogeneity of pupils in the *Gymnasium* has decreased while it has increased in the lower secondary school (*Hauptschule*). The *Hauptschule* is attended mostly by the children of the lower working class. They were excluded from the benefits of the educational expansion (Solga and Wagner 2001). At the same time, the image of the *Hauptschule* has worsened and this type of school has been labelled as a 'ghetto school' which is attended by the 'losers' of the educational expansion in West Germany.

12. The social inequality of receiving a recommendation for the *Gymnasium* has decreased slightly (see the Tables A.2-1, A.2-2, and A.2-3). Compared with offspring in higher social classes, working-class children are still disadvantaged in their chances of receiving a recommendation for the upper secondary school. For example, in the 1960s the likelihood of receiving a recommendation for the *Gymnasium* was 1.9 times higher for the children of civil servants in higher career tracks than for the children of unskilled workers. Up to the 1980s the chances of these children of civil servants receiving a recommendation for the *Gymnasium* had increased to 4 times in contrast to the disadvantaged children of unskilled workers. In parallel to the transition processes there are tendencies towards polarization between the lower classes and the rest of the social classes. However,

when the individuals' school performances in mathematics, grammar, and orthography are taken into account, the primary effects of social origin dominate the potential social discrimination by teachers.

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Table A1–1. *Social class and propensity to continue on to upper secondary school level (Gymnasium) in 1966*

	Planned school track (*Gymnasium*)	Value of benefit B	Status maintenance –SD	Exp. status decline P_{sd}	Educ. performance P_{ep}	Exp. Costs C
Constant	−1.053*** (0.104)	0.296*** (0.087)	−1.390*** (0.122)	−1.053*** (0.104)	−0.144† (0.085)	−0.643*** (0.091)
Skilled worker	−0.044 (0.140)	0.025 (0.114)	0.174 (0.157)	0.062 (0.137)	0.223* (0.113)	−0.105 (0.123)
Farmer with less land	−0.102 (0.147)	0.086 (0.119)		−0.102 (0.147)	0.050 (0.117)	−0.250* (0.131)
Farmer with large land	0.317 (0.398)	0.206 (0.374)		0.317 (0.398)	0.880* (0.393)	−0.784 (0.520)
Farmer			0.243 (0.158)			
Unskilled employee	0.152 (0.238)	0.043 (0.202)	0.323 (0.253)	0.546* (0.215)	0.015 (0.199)	0.193 (0.207)
Skilled employee	0.455** (0.146)	0.087 (0.131)	0.387* (0.168)	0.165 (0.152)	0.268* (0.128)	−0.246† (0.144)
Managerial employee	1.110*** (0.151)	0.556*** (0.152)	0.565*** (0.174)	0.201 (0.163)	0.472*** (0.140)	−0.565*** (0.170)
Servant in lower civil service career	0.040 (0.249)	−0.156 (0.206)	0.170 (0.276)	0.129 (0.242)	0.171 (0.205)	0.086 (0.218)
Skilled civil servant in upper or intermed. career	0.493*** (0.148)	0.210 (0.135)	0.656*** (0.164)	0.277 (0.152)	0.253* (0.131)	−0.177 (0.145)
Skilled civil servant with academic certificate	1.812*** (0.211)	0.521** (0.205)	1.128*** (0.207)	0.351† (0.208)	0.543** (0.190)	−0.302 (0.215)
Small and intermediate entrepreneurs	0.277* (0.139)	0.142 (0.121)	0.409** (0.157)	−0.039 (0.146)	0.095 (0.118)	−0.599*** (0.143)
Entrepreneur or director of a large firm	1.619*** (0.308)	1.372** (0.476)	0.514 (0.338)	0.177 (0.332)	0.084 (0.287)	−0.425 (0.351)
Professional	1.372*** (0.281)	0.135 (0.278)	1.180*** (0.285)	−0.097 (0.344)	0.354 (0.272)	−0.508 (0.340)
Pensioner and other non-employed person	1.290*** (0.247)	0.378 (0.256)	0.811** (0.265)	1.132*** (0.245)	0.301 (0.238)	−1.220** (0.446)
Pseudo-R^2	0.122	0.017	0.039	0.025	0.011	0.027
Chi^2	234.03	36.37	58.37	39.68	26.8	44.46
Degrees of freedom	13	13	12	13	13	13
Number of cases	1685	1685	1685	1685	1685	1685

Notes: The results reported are from a probit regression. Standard errors of coefficients are presented in parentheses.
Unskilled worker is the reference category.
* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$; † $p \leq 0.1$
Source: ZA-Survey 893: *Elternhaus und Bildungschancen* (author's calculations).

Table A.1-2. *Social class and propensity to continue on to upper secondary school level (Gymnasium) in 1970*

	Planned school track (*Gymnasium*)	Value of benefit B	Status maintenance -SD	Exp. status decline P_{sd}	Educ. performance P_{ep}	Exp. Costs C
Constant	−0.700*** (0.065)	−0.708*** (0.065)	0.662*** (0.065)	−0.720*** (0.066)	1.220*** (0.079)	0.014 (0.060)
Skilled worker	0.231 (0.196)	−0.250 (0.197)	−0.153† (0.090)	−0.101 (0.095)	−0.011 (0.112)	0.008 (0.085)
Foreman	−0.064 (0.470)	−0.057 (0.470)	0.559 (0.557)	−0.045 (0.470)	−0.455 (0.472)	0.751 (0.469)
Farmer	−0.242 (0.215)	−0.162 (0.210)	−0.419* (0.187)	−0.706** (0.264)	0.355 (0.291)	−0.062 (0.184)
Unskilled employee	−0.169 (0.290)	−0.312 (0.306)	0.207 (0.290)	0.324 (0.261)	−0.022 (0.332)	−0.111 (0.253)
Skilled employee	0.818*** (0.159)	0.859*** (0.159)	0.449* (0.193)	0.137 (0.165)	0.393† (0.252)	−0.233 (0.158)
Managerial employee	1.206*** (0.165)	1.139*** (0.163)	0.583** (0.204)	0.214 (0.165)	0.531* (0.274)	0.036 (0.157)
Servant in lower civil service career	0.700* (0.303)	0.568† (0.304)	0.305 (0.357)	0.289 (0.313)	0.007 (0.399)	0.268 (0.306)
Skilled servant in intermediate service career	0.617** (0.238)	0.183 (0.249)	−0.138 (0.249)	0.636** (0.238)	0.062 (0.322)	0.154 (0.238)
Skilled civil servant in upper service career	0.604† (0.354)	1.001** (0.359)	−0.160 (0.370)	1.013** (0.359)	0.206 (0.518)	−0.111 (0.353)
Skilled civil servant with academic certificate	1.952*** (0.392)	1.342*** (0.316)	−0.028 (0.316)	0.654* (0.295)	0.399 (0.483)	−0.213 (0.296)
Entrepreneurs	0.523*** (0.128)	0.332* (0.130)	0.141 (0.140)	0.439*** (0.129)	0.355 (0.291)	−0.033 (0.125)
Self-employed or professional	0.841** (0.265)	0.939*** (0.262)	0.066 (0.285)	−0.080 (0.256)	0.467 (0.374)	0.058 (0.249)
Pensioner and other non-employed person	−0.172† (0.092)	−0.266** (0.094)	−0.082 (0.088)	−0.116 (0.092)	−0.046 (0.108)	0.070 (0.082)
Pseudo-R^2	0.099	0.094	0.016	0.028	0.011	0.004
Chi^2	216.46	196.23	34.55	57.74	14.43	9.25
Degrees of freedom	13	13	13	13	13	13
Number of cases	1840	1840	1840	1840	1840	1840

Notes: The results reported are from a probit regression. Standard errors of the coefficients are presented in parentheses.
Unskilled workers is the reference category.
* $p \leqslant 0.05$; ** $p \leqslant 0.01$; *** $p \leqslant 0.001$; † $p \leqslant 0.1$

Source: ZA-Survey 819: *Chancenzuweisung durch Ausbildung* (author's calculations)

Table A.1–3. *Social class and propensity to continue on to upper secondary school level (Gymnasium) in 1982*

	Planned school track (Gymnasium)	Value of benefit B	Status maintenance -SD	Exp. status decline P_{sd}	Educ. performance P_{ep}	Exp. Costs C
Constant	−0.736*** (0.172)	−0.687*** (0.170)	0.736*** (0.172)	−0.736*** (0.172)	−0.502** (0.163)	0.375* (0.159)
Skilled worker	0.255 (0.190)	0.076 (0.189)	0.271 (0.196)	−0.255 (0.196)	0.125 (0.182)	−0.311 (0.178)
Foreman	0.257 (0.244)	0.368 (0.241)	−0.005 (0.252)	0.005 (0.254)	0.088 (0.237)	−0.240 (0.232)
Craftsman and Polish	0.675** (0.235)	0.286 (0.237)	0.242 (0.257)	−0.178 (0.254)	0.441* (0.229)	−0.062 (0.228)
Farmer	0.219 (0.223)	0.169 (0.221)	−0.185 (0.223)	0.284 (0.222)	0.145 (0.214)	0.947*** (0.247)
Unskilled employee	0.714** (0.239)	0.487* (0.238)	0.342 (0.268)	−0.267 (0.264)	0.303 (0.233)	−0.039 (0.233)
Skilled employee	1.172*** (0.184)	1.023*** (0.182)	0.580** (0.194)	−0.286 (0.189)	0.550** (0.175)	−0.010 (0.173)
Managerial employee	1.488*** (0.191)	1.436*** (0.189)	0.658** (0.203)	0.335† (0.188)	0.791*** (0.180)	0.156 (0.178)
Servant in lower or intermediate civil service	0.887*** (0.203)	0.894*** (0.202)	0.480* (0.224)	−0.442* (0.222)	0.179 (0.197)	0.029 (0.1946)
Skilled civil servant in upper civil service	1.739*** (0.207)	1.620*** (0.204)	0.516* (0.215)	0.385* (0.198)	1.049*** (0.192)	0.259 (0.190)
Skilled civil servant with academic certificate	2.147*** (0.232)	2.148*** (0.233)	0.839*** (0.243)	1.573*** (0.210)	0.960*** (0.197)	0.462* (0.200)
Small entrepreneurs	0.976*** (0.194)	0.757*** (0.192)	0.475* (0.209)	−0.328 (0.204)	0.599** (0.186)	0.127 (0.185)
Self employed or professional	2.531*** (0.360)	2.779*** (0.438)	1.356*** (0.439)	1.645*** (0.261)	1.107*** (0.243)	0.764** (0.268)
Pensioner and other non-employed person	0.526† (0.272)	0.404 (0.271)	0.125 (0.295)	0.306 (0.276)	−0.087 (0.276)	−0.093 (0.265)
Pseudo-R^2	0.148	0.160	0.039	0.149	0.051	0.034
Chi^2	391.53	427.34	57.04	346.40	138.17	84.59
Degrees of freedom	13	13	13	13	13	13
Number of cases	1964	1964	1964	1964	1964	1964

Notes: The results reported are from a probit regression. Standard errors of the coefficients are presented in parentheses.
Unskilled workers is the reference category.
$p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$; † $p \leq 0.1$.
Source: ZA-Survey 1611: *Bildungsverläufe in Arbeiterfamilien* (author's calculations).

Table A.2–1. *Social class and determinants of the transition to upper school tracks in 1967*

	Transition *Realschule*	Transition *Gymnasium*	Recommendation *Realschule*	Recommendation *Gymnasium*
Constant	0.416** (0.159)	−0.220 (0.184)	−0.202* (0.085)	−0.560*** (0.090)
Foreman	0.026 (0.213)	0.194 (0.243)	−0.213† (0.115)	0.126 (0.118)
Farmer with less land	−0.394† (0.217)	−0.231 (0.249)	−0.203† (0.119)	−0.057 (0.125)
Farmer with huge land	0.432 (0.708)	0.219 (0.837)	−0.092 (0.363)	0.267 (0.364)
Unskilled employee	−0.942* (0.384)	−0.233 (0.388)	−0.192 (0.203)	0.053 (0.208)
Skilled employee	0.250 (0.257)	0.736** (0.278)	0.043 (0.129)	0.331* (0.132)
Managerial employee	0.313 (0.362)	2.069*** (0.342)	−0.546*** (0.148)	0.617*** (0.141)
Servant in lower civil service career	−0.416 (0.369)	−0.474 (0.448)	0.118 (0.206)	0.004 (0.217)
Servant in intermed. civil service or skilled civil servant	0.593* (0.275)	1.001*** (0.297)	0.108 (0.131)	0.141 (0.136)
Civil servant with academic certificate	−0.010 (0.665)	2.704*** (0.552)	−1.060*** (0.238)	0.647*** (0.188)
Small entrepreneur	−0.139 (0.225)	0.276 (0.249)	−0.087 (0.119)	0.037 (0.124)
Entrepreneur or director of large firm	0.010 (0.927)	2.299*** (0.772)	−0.866* (0.349)	0.740* (0.289)
Professional	−0.128 (0.780)	1.954** (0.653)	−0.949** (0.339)	0.242 (0.276)
Pensioner and other non-employed person	−0.128 (0.780)	2.340*** (0.638)	−1.116*** (0.319)	0.715** (0.240)
Pseudo-R^2	0.064		0.032	0.024
Chi^2	233.57		69.88	53.13
Degrees of freedom	26		13	13
Number of cases	1685		1685	1685

Notes: The results are from a multinomial regression model and a probit regression; standard errors of the coefficients are given in parentheses. Unskilled workers is the reference category.

p ≤ 0.05; ** p ≤ 0.01; *** p ≤ 0.001; †p ≤ 0.1.

Source: ZA-Survey 893: *Elternhaus und Bildungschancen* (author's calculations).

Table A.2–2. *Social class and determinants of the transition to upper school tracks in 1971*

	Transition *Realschule*	Transition *Gymnasium*	Recommendation of primary school
Constant	−1.576*** (0.141)	−1.250*** (0.123)	−0.513*** (0.063)
Skilled worker	−0.120 (0.200)	−0.446* (0.189)	0.051 (0.089)
Foreman	0.659 (0.848)	0.333 (0.846)	0.653 (0.424)
Farmer	−0.553 (0.494)	−0.879[†] (0.489)	−0.356[†] (0.209)
Unskilled employee	0.352 (0.528)	−0.197 (0.569)	0.011 (0.265)
Skilled employee	1.738*** (0.359)	2.054*** (0.317)	0.396* (0.158)
Managerial employee	1.208** (0.456)	2.656*** (0.333)	0.463** (0.158)
Servant in lower civil service	0.595 (0.691)	1.116* (0.532)	0.513[†] (0.302)
Servant in interm. civil service	0.787 (0.557)	1.491*** (0.421)	−0.011 (0.249)
Skilled civil servant in upper civil service			0.417 (0.354)
Civil servant with acad. cert.			0.177 (0.300)
Skilled civil servant in upper civil service	0.882 (0.721)	2.593*** (0.475)	
Entrepreneur	0.421 (0.298)	1.052*** (0.227)	0.275* (0.127)
Professional	−0.615 (1.109)	1.627*** (0.493)	0.043 (0.252)
Pensioner and other non-employed person	0.177 (0.187)	−0.212 (0.177)	0.156 (0.085)
Pseudo-R2	0.087	1.17	
Chi^2	295.80	27.85	
Degrees of freedom	24	13	
Number of cases	1840	1840	

Notes: The results are from a multinomial regression model and a probit regression; standard errors of the coefficients are given in parentheses. Unskilled workers is the reference category.

p ≤ 0.05; ** p ≤ 0.01; *** p ≤ 0.001; [†]p ≤ 0.1.

Source: ZA-Survey 819: *Chancenzuweisung durch Ausbildung* (author's calculations)

Table A.2–3. *Social class and determinants of the transition to upper school tracks in 1983*

	Transition *Realschule*	Transition *Gymnasium*	Recommendation *Realschule*	Recommendation *Gymnasium*
Constant	0.233 (0.274)	-0.780^* (0.364)	-0.375^* (0.159)	-0.788^{***} (0.174)
Skilled worker	0.430 (0.314)	0.870^* (0.403)	0.050 (0.178)	0.235 (0.193)
Foreman	0.357 (0.432)	1.031^* (0.509)	0.240 (0.232)	0.113 (0.252)
Craftsman and Polish	0.659 (0.439)	1.291^* (0.516)	0.189 (0.227)	0.342 (0.241)
Farmer	-0.454 (0.376)	0.473 (0.449)	0.139 (0.210)	0.303 (0.224)
Unskilled employee	0.383 (0.451)	1.431^{**} (0.509)	0.131 (0.2315)	0.498^* (0.242)
Skilled employee	1.395^{***} (0.353)	3.036^{***} (0.423)	-0.101 (0.173)	0.714^{***} (0.186)
Managerial employee	0.875^* (0.376)	3.098^{***} (0.433)	-0.351^* (0.179)	0.815^{***} (0.190)
Servant in lower or intermediate civil service	$0.644^{\dagger}$ (0.378)	1.879^{***} (0.443)	-0.069 (0.195)	0.503^* (0.206)
Skilled civil servant in upper civil service	1.386^{**} (0.524)	3.894^{***} (0.554)	-0.450^* (0.193)	1.203^{***} (0.200)
Civil servant with academic certificate	0.693 (0.652)	4.222^{***} (0.625)	-0.903^{***} (0.215)	1.2855^{***} (0.207)
Entrepreneur			-0.056 (0.185)	0.626^{**} (0.196)
Self employed and professional			-0.764^{**} (0.268)	1.392^{***} (0.251)
Entrepreneur, self-employed, and professional	0.990^{**} (0.366)	2.726^{***} (0.430)		
Pensioner and other non-employed person	0.604 (0.529)	1.399^* (0.594)	0.093 (0.265)	0.113 (0.286)
Pseudo-R^2	0.105		0.034	0.058
Chi^2	397.18		82.51	158.09
Degrees of freedom	24		13	13
Number of cases	1964		1964	1964

Notes: The results are from a multinomial regression model and a probit regression; standard errors of the coefficients are given in parentheses. Unskilled workers is the reference category.