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Family Processes and Socioeconomic Outcomes

Educational Opportunities of Children in Poverty*

By Anke Schöb**

Summary

In this paper, I use data from the German Socio-Economic Panel (GSOEP) to investigate whether and how a German youth's choice of secondary school (Hauptschule, Realschule, Gymnasium) varies with the timing and duration of poverty experienced in childhood. To investigate what role the timing of poverty plays, I examine the correlation between educational choices and the poverty status of each child's household in the three years preceding the educational decision to be analysed. Not surprisingly, persistently poor youth are less likely to choose higher educational trajectories.

1. Introduction

Research on childhood poverty in Germany is, as in most other industrial countries, still in its infancy. As an exception, there is quite a bit of child poverty research in the United States, perhaps because the child poverty rate in the U.S. has been 1.5 to 4 times higher than rates in other industrial countries (Duncan et al. 1998: 406). In the last decade, however, poverty rates in Germany have begun to show similar structural patterns as rates in the U.S. Over time Germany has witnessed a structural shift in the risk of becoming poor and dependent on social assistance. In the early 1960's elderly people, especially elderly woman, faced the highest risk of becoming poor. By the 1990's, children and young people were most at risk (Buhr and Weber 1999). In addition to these demographic shifts, the understanding of the dynamics of poverty has changed over time. Empirical studies of poverty in postwar Western industrial countries show that, for most people, poverty is short-term rather than a lifelong situation. As a result, poverty is now more often conceptualized and investigated as part of a dynamic process than as a static state.

2. Childhood Poverty and Educational Chances — A Review

Several hypotheses have been advanced in the literature to explain the lower educational achievement of children who grow up in poverty. These explanations are based on more general models of status attainment, early socialization, and family stress. The economic perspective of the human capital model emphasizes the allocation of resources within the family (Schultz 1961; Becker 1993). In that model, parents allocate income between current consumption and investment in childrens' human capital, usually measured by years of schooling. The model implies that, when resources increase, parents invest more in their childrens' human capital. Since poor families are constantly in economic crisis, these families are less likely to invest in their children. Socialization-based explanations stress the possible effect of parental attainment and behavior on their childrens' educational and labor market aspirations and performance. Corcoran et al. (1985: 520) note: "In general it was suggested that (1) the poor have distinct values, aspirations, and psychological characteristics, which (2) inhibit their achievement and produce behavioral deviancies likely to keep them poor and (3) persist not only within but across generations through socialization of the young." Family-stress models emphasize the relevance of coping processes within families for stressful events such as separation, divorce or unemployment of parents. In this case it is the *event* that caused the income loss rather than the *state* of poverty that leads to negative consequences for offspring. Some empirical evidence supports this hypothesis. McLoyd

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(1989: 299) finds that parents who experience economic hardship are more pessimistic about their lives and the future of their children and more frequently report negative changes in educational plans for their children. Walper (1988: 267) finds that poorly educated parents, in particular, are found to reduce their educational aspirations and refrain from long-lasting educational tracks after having experienced a loss in income.

To understand fully how poverty might affect educational attainment, it is important to consider both the severity and duration of poverty. Consider the different dimensions of poverty tabulated by Ashworth et al. (1994):

- *Prevalence* can be defined as the share of people within one group experiencing poverty during a given period of time,[1]
- *Duration of poverty*, refers to the length of poverty spells (distribution of poverty spells by length) and to the total duration of poverty experienced over a given period (distribution of poverty across people)
- *Repetition* is defined as the extent to which poverty repeats itself, and
- *Severity* represents the amount of shortfall in economic resources.

Ashworth et al. (1994) distinguish six patterns of childhood poverty based on the number, duration, and spacing of poverty and non-poverty spells. They label these as transient, persistent, permanent, occasional, recurrent, and chronic. Recurrent poverty, the most common type experienced by American children, is defined as repeated spells of poverty, some lasting over one year with at least one period of relative prosperity of more than a year.

Time-related dimensions of poverty have received attention in the literature as potentially important determinants of later outcomes. Researchers have noted the need to distinguish between single and repeated spells of poverty and the length of those spells. They argue that repeated spells may not constitute the same experience of hardship as a single spell, and that the effects of poverty may compound if it persists. At the same time duration effects may be masked if one fails to account for the amount by which resources exceed the poverty level. For example, a family whose resources only barely place them above the poverty line in one year would empirically not be in poverty but their child is unlikely to receive much additional investment in his or her human capital.

These patterns of childhood poverty have been used in empirical research in various combinations. Lauterbach and Lange (1998) study how poverty and parental anxiety relate to childrens' participation in higher education. While they find that children who experience poverty attain less education, their study does not account for dynamic aspects of poverty. Corcoran et al. (1992) present evidence that the duration of poverty matters empirically. Corcoran et al. (1992) find that adolescents living longer in poverty were significantly less successful in school and had worse early career outcomes even controlling for the average level of family income over the period the adolscents were observed. Similarly, Duncan et al. (1994) find that cognitive development and behavior of children varies with how long they experienced poverty. Haveman et al. (1991: 144) show that the timing of a poverty spell matters. They find that a youth was significantly less likely to complete high school if his family experienced poverty and received welfare when he was an adolescent than youth who experienced poverty at a younger age.

3. Data and Measurement

Data

Data are drawn from eleven waves of the German Socio-Economic Panel (GSOEP) 1984-1995. In this household-based survey, information is collected directly from all members aged 16 and older. Information on younger children is collected from a proxy respondent. The head of household (or main respondent) provides information on the sex, age and attendance at institutions (kindergarten, primary school, etc.) for all children under the age of 16. To preserve as long a sample as possible, I use data from the two subsamples of the GSOEP that have the longest panel. These samples, known as sample A and sample B, are defined as those households headed by a German national or foreigner respectively. Although GSOEP households with a foreign household head are over-sampled, I use sample weights in all descriptive analyses to correct for their overrepresentation (cf. Pannenberg and Rendtel 1996). These data are not ideal because low-income households and recipients of social assistance in particular are underrepresented (partly by sample design).[2] In spite of these drawbacks, the GSOEP provides the best available German data for this study.

Educational decisions

German children enter primary school when they are six years old. Typically primary school lasts four years but some states in Germany extend primary school attendance to six years and this extension has been adopted in recent years in other states. At the end of primary school, a child and his or her parents must select one of three

[1] Prevalence is the longitudinal equivalent of the cross-sectional poverty rate and the two values are equivalent where all the poor are always poor; thus there is no movement across the poverty line.

[2] Homeless people or people living in common lodging-houses are explicitly excluded from the sample design.

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types of secondary school he or she will attend.[3] The *Hauptschule* involves the least amount of schooling. It prepares children to enter enterprise-based vocational training (apprenticeship). *Realschule* involves slightly more schooling and prepares children to pursue further training or to enter vocational schools. Graduates from the highest level of secondary education, the *Gymnasium*, are allowed to enter university and university-like forms of professional training. Although not final, this first educational choice can be revised only with major effort and thus it largely determines a child's future educational trajectory.

In order to identify the type of secondary school a child chooses, I compare the type of school he or she attended across adjacent waves of data. A transition from primary to secondary school is defined to have occurred if the following conditions hold:

- In one of the panel waves between 1984 and 1995 the main respondent stated that the child attends primary school (*Grundschule*) and in the consecutive wave the child's school attendance question was responded with a secondary school category (*Hauptschule*, *Realschule*, *Gymnasium*, *Integrierte Gesamtschule*, *Sonderschule*).[4]
- The transition takes place between the ages of 9 and 12 and the child is born between 1975 and 1982.

The last restriction eliminates children who move from primary to secondary school at older ages, either because they repeated one or more grades or for state-specific institutional reasons. The school years covered in the sample period are 1984/85 to 1994/95. The earliest transitions observed in the sample are those of youth who were born in 1975 (who are 9 in the 1984/85 school year) while latest transitions are those of youth born in 1982 (who are 12 in the 1994/95 school year).

Note that children in the German states of Bavaria and Hamburg who wish to attend *Realschule* (the middle-level secondary school track) do not move directly there from primary school. Instead they must first spend two years in *Hauptschule* (the lowest-level track). On successful completion of *Hauptschule* they then start their career at *Realschule* (entering in the same grade as attended by children in other states who proceeded directly from primary school to *Realschule*). Consequently, in the sample, analysis of the first transition is likely to overestimate transition rates into *Hauptschule* but underestimate transition rates into *Realschule*.[5]

Independent variables

The theoretical literature and previous empirical work suggests that family characteristics surrounding early educational decisions will determine the choices taken (Schöb 1997). In the empirical analysis I focus on family characteristics in the three-year period immediately preceding the transition from primary to secondary school. To avoid mixing the disruptive influence of family dissolution with effects of resource changes, the sample is further restricted to children living with both parents. Finally, children who attend *Integrierte Gesamtschule* or *Sonderschule* are dropped from the sample.

Poverty measured by relative income. Families with net household income less than 60 percent of the median net household income are regarded as poor. In the GSOEP surveys, the head of household reports total monthly household income after taxes including government transfers and subsidies. To account for economies of scale that enable bigger households to be more efficient in the use of their resources, household income is adjusted to account for differences in family size. The adjustment factor is a weight that indicates the amount of income (consumption) needed by individuals of different age as a fraction of the amount needed by a fully-grown adult. This income corresponds to regulations of the federal social assistance law [Bundessozialhilfegesetz (BSHG)].[6] Each household member is assigned his or her per capita equivalized household income and coded as either living in or out of poverty. To capture the severity and duration of poverty, two indicators are used:

- The duration of poverty is measured by three dummy variables: whether the family was poor in (1) one, (2) two or (3) all three years preceeding a child's educational choice.
- The measure of long-term economic family status is based on the income-to-needs-ratio averaged over the three years preceding educational decisions (relative income position).[7]

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[3] Two other types of schooling exist. *Integrierte Gesamtschule* include grades from traditional primary and secondary schools and schools educating special populations known as *Sonderschule*. Individuals in both types of schools are excluded from the analysis.

[4] If there is more than one change, the first transition is used. I also exclude children who, in 1984, are already attending secondary school or are in their last year of primary school.

[5] The selection rule defined above yields a basic sample of 1130 children with (weighted) first transitions from primary to secondary school as follows: 44% Hauptschule, 17% Realschule, 31% Gymnasium, 7% Integrierte Gesamtschule and 1% Sonderschule. Taking into account the institutional settings, this sample distribution approximates the distribution of seventh class pupils across the five categories of secondary schools in Germany (Geißler 1996).

[6] The head of a household is assigned a weight of 1.0. All other adults (aged 19 or older) get a weight of 0.8. Children aged 0 to 7 are assigned a weight of 0.5, children 0 to 7 with only a single parent present are assigned a weight of 0.55, children aged 7 to 14 are assigned a weight of 0.65, and persons aged 15 to 18 get a weight of 0.9.

[7] The estimation includes the income-to-need-ratios and not the total amount of income; if income and needs are entered separately in an estimation Blau (1999) finds that the negative effect of needs is much larger in absolute value than the positive effect of income. He concludes that the income-to-need-ratio might not be useful because it combines the effects of two variables that have a very

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Demographic characteristics and institutional variation. The model includes both the nationality of the head of household in the year of transition (German/non-German) and the child's sex. To account for institutional differences in school transitions in Bavaria and Hamburg, a dummy variable is included to indicate individuals living in those states.

Non-material resources and constraints. The education and employment status (in the year of the child's school transition) of each child's father and mother are (separately) included to control for available resources and constraints on the parents' ability to invest in their child's education. Following the human capital literature, the level of education of each parent is measured in terms of years. Because no variable in the survey instrument collects the years of education of respondents, I use the measure of education generated by survey staff (Haisken-De New and Frick 1996: 39). That measure adds years of schooling in the various types of German school systems (e.g. vocational and college preparatory) using weights for each type of schooling. The employment status variables only measure whether the father (mother) was employed or not in the year of the transition from primary to secondary school. Finally, the number of other children in the household aged 0 to 16 is included to account for other demands on parental time and resources.

Statistical model

Empirical studies of educational decisions have frequently made use of the ordered logit model. That model imposes the assumption that different types of secondary schools impart a similar type but different levels of education. Ignoring the *Integrierte Gesamtschule* and the *Sonderschule*, the three categories of *Hauptschule*, *Realschule* and *Gymnasium* can be considered as ranked, e.g., with respect to years of education or the formal status of their grades. The ordered logit model, however, assumes that the association between the independent variables and choice of outcome is similar in nature and only differs proportionally. The association between covariates and dependent variable is estimated using a single regression coefficient. In most cases, the assumption of proportionality is imposed *post hoc* rather than motivated by theory *a priori*. Such an assumption may not be justified. In this study, for example, the peculiarity of the Bavarian and Hamburg schooling system is expected to affect the transition to *Hauptschule* and *Realschule* but not to *Gymnasium*.

For this reason a multinomial logit model is used. The multinomial logit model allows one to analyze the determinants of the choice of secondary school type without assuming there are ordered categories differentiated only by the level of human capital. The association between a given factor and the probability of choosing a particular school type (relative to all others) is estimated with maximum likelihood methods. Given parameter estimates, one can easily calculate the marginal effect of a given regressor on relative choices. Marginal effects are frequently presented in terms of the log-odds ratio. Using subscripts HS, RS, and GS to designate respectively the choice of *Hauptschule*, *Realschule*, and *Gymnasium*, the marginal impact of a change in a given covariate x on the log-odds that an individual chooses *Realschule* over *Hauptschule* is given by: $\ln(P_{RS}/P_{HS}) = \zeta_{RS} x$.

Where ζ_{RS} is the coefficient estimate on characteristic x among those who chose to attend *Realschule*. One can also calculate the marginal effect of x on the log-odds of a choice relative to a different base by taking the difference in the log-odds yielded by the model. Using *Hauptschule* as base category, the marginal effect of x on the log-odds of choosing *Realschule* over *Gymnasium* is given by:

$$\ln\left(\frac{P_{RS}}{P_{GY}}\right) = \ln\left(\frac{P_{RS}}{P_{HS}}\right) - \ln\left(\frac{P_{GY}}{P_{HS}}\right).$$

4. Empirical Results

Table 1 summarizes descriptive statistics on children with transitions to one of the three types of secondary schools considered. Table 1 reproduces well-known stylized facts: girls are more likely to choose *Realschule* and *Gymnasium*, children living in families with a foreign-born head of household are more likely to enroll in *Hauptschule* and a child's educational choice is correlated with each parent's years of education. These unconditional means suggest that children whose fathers are not working in the year of transition are more likely to enroll in *Hauptschule*. Finally, children from poor families are more likely to choose school types involving less ultimate education.

Table 2 presents descriptive statistics relating choice of school type to the poverty status of the child's family. Recall that income status is measured over the three years prior to the year the child entered secondary school. Relative income is measured as an average of household income over the three years, relative to 60 percent of median household income. Table 2 shows that the relative income position of children going to *Hauptschule* or *Realschule* is below the sample average of 1.51. The standard deviation of relative income across the set of children who enrolled in *Hauptschule* and *Realschule* suggests that these groups are much more homogeneous with respect to relative income than the group of pupils

different effect on the outcomes. The negative effect of needs reflects the well-known fact that children from larger families have lower achievement than other children.

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Table 1

Descriptive Statistics

	All	Hauptschule	Realschule	Gymnasium
Percent of Sample[1]	100	47.3	18.0	34.7
Demographic characteristics				
Child's Gender[1]				
male	48.4	51.8	16.0	32.2
female	51.6	43.0	19.9	37.1
National Origin of Head[1]				
foreign-born	13.1	69.6	17.1	13.3
german	86.9	44.0	17.9	38.1
Non-material resources and constraints				
Mother's Education (years)[2]	10.9	10.1	10.8	12.2
	(2.24)	(1.52)	(2.19)	(2.49)
Father's Education (years)[2]	11.9	10.6	11.4	13.9
	(2.76)	(1.70)	(2.13)	(3.09)
Number of children under 16[2]	2.1	2.1	1.9	2.1
	(0.89)	(0.99)	(0.79)	(0.77)
Mother's Employment Status[1]				
working	49.6	47.5	15.2	37.3
non-working	50.4	46.6	20.4	33.0
Father's Employment Status[1]				
working	96.3	46.8	17.8	35.5
non-working	3.7	61.2	19.8	19.1
Family Economic Situation (t_0)[3]				
Relative Income Position (t_0)[2]	1.50	1.33	1.37	1.83
	(0.74)	(0.63)	(0.50)	(0.88)
Poor (t_0)[1]	17.9	69.0	20.5	10.5
Non-Poor (t_0)[1]	82.1	43.4	17.4	39.1

1) Share in percent. — 2) Mean and standard deviation (in parentheses). — 3) t_0 is defined as the last year of primary school attendance. — N = 949. Data are weighted.

Table 2

Characteristics of Poverty and Choice of School Type

	Hauptschule	Realschule	Gymnasium	All
Relative Income Position (t_{-2}–t_0)[1]	1.30	1.33	1.85	1.51
	(0.44)	(0.43)	(1.03)	(0.76)
Time in Poverty (t_{-2}–t_0)[1]	0.85	0.58	0.11	0.50
	(1.19)	(0.98)	(0.39)	(0.53)
Duration of poverty (t_{-2}–t_0)[2]				
Never	60.3	70.3	91.2	73.7
1 time	13.1	9.5	6.9	10.1
2 times	7.6	12.3	1.4	6.2
3 times	18.9	7.9	0.5	10.0

1) Mean and standard deviation in parentheses. — 2) Share in percent. — N = 776. Data are weighted.

Source: GSOEP. Author's calculations.

attending *Gymnasium*. In this sample, the average child is in relative poverty six months of the three years preceding his secondary school transition. Time in poverty appears to be correlated with the years of education implied by these three choices. Those who spend the least time in poverty are more likely to attend *Gymnasium* while those spending the most time in poverty are more likely to enroll in *Hauptschule*. The bottom half of Table 2 shows that this apparently monotonic relationship varies in interesting ways when one considers the measures of the persistence of poverty. Those children never or seldom (1 year only) in poverty were more likely to choose a school type leading to more rather than less education. Those children whose families were in relative poverty in at least two of

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three years were more likely to choose *Realschule*. Almost no children chose to attend *Gymnasium* if they lived in families that were relatively poor over all three years.

Table 3 presents coefficient estimates from multinomial logit regression models where *Hauptschule* is defined as the base category. Three models were specified and estimated. Models 1 and 2 exclude from the preferred specification (Model 3) subsets of regressors related to poverty.[8] Model 1 excludes characteristics related indirectly to resources. Model 2 excludes all measures of poverty.

Interestingly, while the unconditional means in Table 1 suggested that children in households with a foreign-born head predominantly chose to attend *Hauptschule* over *Realschule* or *Gymnasium*, the results in Table 3 show that, once one controls for poverty status and other types of resources, this is no longer true. Controlling for poverty status, parental and family characteristics, the choice of secondary school type does not statistically differ by the national origin of the household head. There is weak evidence that boys are less likely to choose *Realschule* over *Hauptschule*. Not surprisingly, parental education is strongly correlated in the expected manner with the choice of school type. Note also that simple specifications that exclude measures of parental resources and constraints (Model 1) will likely lead researchers to infer that school choice is positively associated with a household's relative income position. This inference is not supported, however, in a more completely specified model (Model 3).

[8] Log-likelihood tests on hierarchical nested models 3 and 1 as well as 3 and 2 reject the hypothesis that the log-likelihood is invariant to the addition of the relevant variables.

Table 3

Multinomial Logit Regression Coefficients: Model of Choice of School Type[1)]

	Model 1		Model 2		Model 3	
	RS	GY	RS	GY	RS	GY
Constant	–.101	–2.058**	–1.890*	–7.698**	–1.378	–6.525**
	(.567)	(.473)	(.903)	(1.010)	(1.019)	(1.126)
Demographic characteristics						
Child's Gender						
Male	–.424*	–.211	–.435*	–.289	–.462*	–.310
	(.204)	(.194)	(.209)	(.208)	(.211)	(.213)
National Origin of Head						
Foreign-born	–.856**	–1.293**	–.304	–.699**	–.360	–.450
	(.221)	(.233)	(.236)	(.247)	(.244)	(.259)
Non-material resources and constraints						
Mother's Education (years)			.200**	.336**	.217**	.293**
			(.067)	(.063)	(.069)	(.065)
Father's Education (years)			.131*	.388**	.156**	.322**
			(.057)	(.053)	(.060)	(.056)
Children under 16 years (number)			–.307**	–.160	–.364**	.041
			(.114)	(.119)	(.122)	(.131)
Mother employed			–.315	–.061	–.256	–.380
			(.213)	(.213)	(.226)	(.228)
Father employed			–1.129**	–.174	–1.021*	–1.071
			(.427)	(.572)	(.462)	(.651)
Family Economic Situation						
Relative Income Position	–.035	1.434**			–.623	.528
	(.352)	(.271)			(.383)	(.313)
Duration of Poverty						
1 time poor	–.457	–.322			–.685	–.574
	(.376)	(.352)			(.389)	(.376)
2 times poor	.247	–.442			.040	–.767
	(.362)	(.460)			(.380)	(.483)
3 times poor	–.049	–1.157*			–.262	–1.688**
	(.385)	(.574)			(.423)	(.619)
Log-Likelihood	–640.1		–596.4		–576.7	
Chi2	231.4**		318.7**		358.1**	
N (unweighted)	753		753		753	

1) Standard errors in parentheses. — Hauptschule is the base category. RS – Realschule. GY – Gymnasium. — ** p < 0.01. — * p < 0.05. — All models include a dummy for individuals living in Bavaria or Hamburg.

Source: GSOEP. Author's calculations.

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The results in Table 3 provide some evidence that there are insights to be gained by more detailed measures of poverty. Even controlling for other factors, children from persistently poor families are less likely to pursue university-oriented education (*Gymnasium*) relative to *Hauptschule*. This association is even stronger when other parental characteristics are held constant, such as parental education and employment status. The results suggest that enduring long-term poverty may alter secondary school choices in ways that periodic episodes of poverty do not.

5. Concluding Remarks

Little is known about whether educational outcomes vary with the *timing* of poverty spells during childhood. Duncan et al. (1998) show that family economic conditions in early childhood had a bigger impact on completed schooling than did income changes during middle childhood. Our results, based on the three year period preceding early educational decisions of German children underline this dynamic perspective on poverty. Using measures of the duration of poverty, we find that the persistently poor are much less likely to pursue secondary school education leading to a university degree.

Like most research in this area, we are not able to draw any conclusions about the causal nature of persistent poverty. Numerous social scientists have observed that, though exogenous events do impoverish families, many families become poor through choices they have made. Until we can separately identify those children who were randomly assigned to poor families, our empirical evidence can only point to statistical, not causal, associations.

In this study I measured poverty status over only three years. With a longer perspective it will become possible to measure family circumstances faced by a child when very young. With more years of data it will also be possible to more precisely estimate the association between school choices and the timing of poverty spells.

In the wider framework of the literature on the intergenerational transmission of poverty, there are theoretical arguments that suggest that parental poverty and low parental education do *cause* children to be poor. However, until social scientists are able to use longer panels of longitudinal data, those hypotheses cannot be tested empirically for German youth.

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