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Educational Expansion and Educational Reproduction in Eastern Europe, 1940-1979*

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Abstract: This paper considers changes in the effects of parental background on educational attainment in five Eastern European nations (Bulgaria, Czech Republic, Hungary, Poland, and Slovakia) over the 1940-1979 period. Data of male respondents (N = 13,997) from Treiman and Szeleny's 'Social Stratification in Eastern European' surveys held in these countries are analysed. The paper shows slight but consistent decreases in the effects of parents' education, status and political party-membership on final educational attainment (measured in years of schooling). On the other hand, it demonstrates stability or increases in the effects of parental background on the continuation probabilities at schooling transitions. Applying a method developed by Mare (ASR 1981), the paper reveals that the slight decreases in the effects of parental background on final educational attainment result from two offsetting influences. Stability or slight increases in the effects of parental background on school continuation probabilities in schooling transitions resulted in the stability of increase in these effects, whereas the substantial educational expansion that occurred in these nations resulted in their decrease.

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Introduction

The role of education in the process of status attainment has become increasingly important in modern industrialised societies. Social stratification researchers have therefore paid much attention to the determinants and consequences of educational attainment. Studies on this topic were primarily focused on Western industrialised nations, whereas the social inequalities in Eastern Europe have relatively scarcely been documented. In most communist nations under Communism (especially in Bulgaria and Russia) the totalitarian governments did not allow to hold empirical stratification surveys or to publish their factual results. This despite the fact that in the former Communist nations forceful attempts were made to create more equalitarian societies for more than forty years, and it is clearly of interest to know to what extent these attempts have been successful.

The breakdown of Communism in Central and Eastern European nations at the end of the 80's improved the possibilities for social stratification researchers to hold new cross-national surveys in these nations [e.g. Treiman and Szelenyi 1993a, 1993b]. These

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surveys do not only provide us with information about stratification patterns after the breakdown of Communism, but also about these patterns during the Stalinist and neo-Stalinist regimes, since the surveys also collect retrospective data. This paper uses such retrospective data and aims to examine the changes in the effects of parental background on educational attainment in five Eastern European nations (Bulgaria, Czech Republic, Hungary, Poland and Slovakia) over the 1940-1979 period. In addition, the paper aims to examine why earlier studies on educational reproduction in Eastern Europe came up with contradictory conclusions.

In earlier studies the conclusions on changes in the effects of parental background on school success in Eastern Europe were not univocal [Shavit and Blossfeld 1993, Gerber and Hout 1996]. The divergent outcomes seem to be related to the different methods of analyses employed in the studies. Traditionally, studies focused on the (overall) effects of parental background on people's final attained level of education, commonly measured in total years of schooling, and using linear regression techniques [Blau and Duncan 1967]. This method results in a single indicator of the effect of social origin on the final level of education, and it can easily be examined whether this indicator has changed over time. The results of most of the studies employing this linear regression method indicated a decline in the effects of parental background over the past decades in Eastern European nations.

More recently, studies considered educational attainment as a sequence of transitions within an educational career, and examined the effects of parental background on school continuation probabilities in each of these transitions [Mare 1980, 1981; Simkus and Andorka 1982]. These studies do so, since the linear regression method obscures that effects of parental background can differ across schooling transitions. Consequently, the indicators for the effect of parental background on final educational attainment obtained by applying the linear regression method are biased by the distribution of education in a society [Shavit and Blossfeld 1993]. This bias is relevant in Eastern European nations, since their educational systems have shown a rapid and substantial growth in attained levels of education. The more recent studies, employing the school continuation probabilities in different transitions, hardly revealed a decline in the effects of parental background over the past decades in Eastern European nations.

In this paper we therefore re-examine the changes in the effects of parental background on school success in Eastern Europe by employing both mentioned methods of analyses, and comparing their results. To do this, data are analysed from large-scale cross-nationally comparable surveys held in these nations in 1993 within the international project 'Social Stratification in Eastern Europe after 1989' [Treiman and Szelenyi 1993a, 1993b], while applying a research design using cohorts as baseline units of historical comparison. In addition a procedure developed by Mare [1981] is employed to connect directly the outcomes of both methods. This procedure makes it possible to get a precise idea of the consequences of changes in the educational distributions in Eastern European countries on the (overall) effects of parental background on final educational attainment in these nations.

Summarising, in order to examine possible changes in the effects of parental background on their children's educational attainment in Bulgaria, Czech Republic, Hungary, Poland and Slovakia, the following questions will be addressed:

1. *To what extent did the distributions of education change in Eastern European nations over the 1940-1979 period?*
2. *To what extent did the effects of parental background on final educational attainment vary between these Eastern European nations and over time over the same period?*
3. *To what extent did the effects of parental background on school continuation probabilities at different transitions in these countries change over the studied period?* and
4. *What were the consequences of (1) changes in the distribution of education and (2) changes in the effects of parental background on school continuation probabilities at different school transitions on the effects of parental background on final educational attainment in Eastern European nations?*

Theories of variation in educational stratification

The effects of parental background on educational attainment are strong and consistent in all industrial societies. It is also true for Central and Eastern European countries where strong effects are found [Shavit and Blossfeld 1993; Peschar 1990, 1993; Matějů 1990; Simkus and Andorka 1982; Robert 1991a, 1991b; Ganzeboom and Nieuwebeerta 1996]. However, many scholars argued that the effects of parental background have changed with time and differed between nations, and discussed several theories explaining these variations. In this paper we give a brief overview of four main explanations and refer to Shavit and Blossfeld [1993] and De Graaf and Luijkx [1995] for more extended discussions. The theories concern explanatory factors ranging from increasing industrialisation and modernisation, to policy measures taken to create more equalitarian educational systems.

The first theory to be discussed is the modernisation theory. The arguments of this (functionalist) theory, already given by several sociologists, were actually systemised by Blau and Duncan [1967]. The basis of this theory is that the more modern and industrialised societies become, the more efficient labour has to be carried out, that is by the best available workers. Here 'best available' means with respect to talent and effort, and not with respect to their ascribed characteristics that were from their social background. Thus, according to this theory the modernisation and industrialisation of a given society goes together with a process from 'ascription' to 'achievement'. This general notion of the modernisation theory is supplemented by Parsons [1970], when he argued that the modernisation of a society goes together with an accompanying change in value systems. The value patterns change towards more equalitarian political values. Furthermore, others have claimed that changes towards more equalitarian political values and more objective needs for equalitarian opportunities are reflected in governmental policies. By means of scholarships and other measures, the governments of most industrial nations have lowered the financial and social thresholds in the educational system. All these arguments therefore suggest that according to the modernisation theory, the influences of (ascribed) family characteristics on educational attainment decline along with modernisation.

The cultural reproduction (conflict) theory, however, suggests that the influence of the social background will not decline with modernisation. This theory points to the enduring influence of cultural status in education, particularly in secondary and tertiary schooling [Bourdieu and Passeron 1994]. According to this theory, the educational system is in favour of children who bring with them cultural preferences and competence from home and are subsequently rewarded at school. This argument seems strong, since

several studies have shown that the association between people's social background and their educational attainment can be explained by their parents' cultural resources. Therefore, this theory predicts that also in (modernised) societies where there are no financial constraints to participate in the educational system, an effect of people's social background will exist and is possibly even greater than in less modernised nations. Thus, based on this theory it can be predicted that – certainly in later transitions – the effects of parental background have remained stable or increased over time.

The third theory we will discuss the socialist transformation theory. This theory assumes that certainly in their beginning the socialist regimes in the Eastern European nations studied carried out policies aimed to create more equalitarian societies. These policies therefore can be expected to have reduced the effects of parents' resources on their children's education. After some years, however, the ruling (Communist) elite tried to preserve their status quo for themselves and for their children [Matějů 1990]. Consequently, the effects of parental background on education will eventually become stronger.

The fourth theory, the differentiated selectivity/educational expansion theory, predicts that, under the conditions of rising levels of education in a society, the effects of parental background on continuation probabilities in transitions will increase. This prediction is based on the assumption that later schooling transitions are in general less selective on parental background, since students at later transitions are more homogeneous with respect to intermediate factors between parental background and educational attainment, e.g. talent and motivation [Shavit and Blossfeld 1993]. If due to educational expansion growing proportions of all social groups reach higher levels of schooling, then the higher transitions become more heterogeneous with respect to factors like talent and motivation, and larger effects of parental background on school continuation probabilities can be expected. However, whether the total effect of parental background on final educational attainment will also increase is less clear, since with educational expansion an increasing number of people reach higher transitions where the effects of parental background are relatively smaller, which result in a downward pressure on the total effect of parental background in that country.

Educational systems in Eastern European nations

The history of the educational systems in most Eastern European countries can be divided in two periods – before and after 1948. In the earlier period, i.e. also before World War II, primary education and secondary education took, on average, about thirteen years – age 6 to 19 – whereas most nations recognised three stages. The first five to six years consisted of basic elementary education. This could be continued with three to four years of upper elementary education or lower secondary education on the one hand, or lower vocational education or middle schools on the other hand. After completion of lower vocational education, the end of the schooling career was reached. Middle schools led to secondary vocational schools, and upper elementary or lower secondary prepared for general, higher or academic secondary education (gymnasium). General secondary schooling took about four years of education. Higher education took four to five years to complete. For all countries, higher education was restrictive, costly and highly exclusive in the period preceding W. W. II.

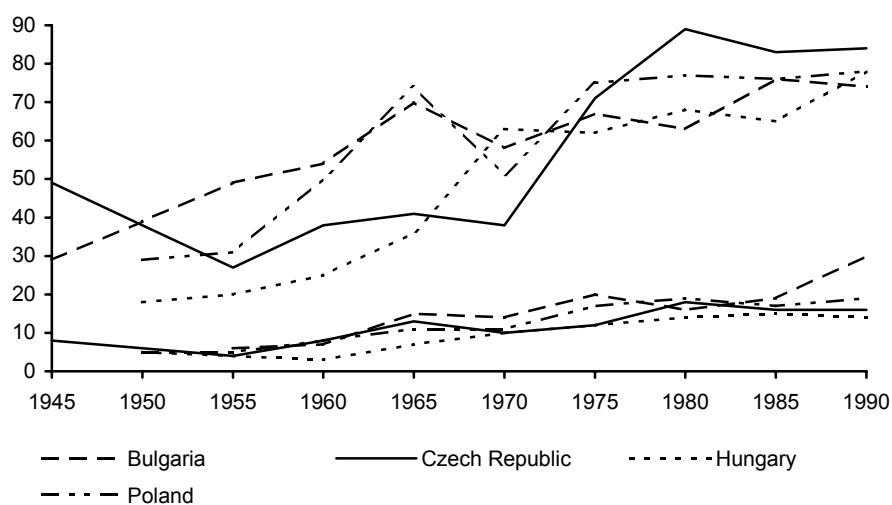
Around 1948, after World War II and the take-over of Communism in Eastern European nations, the school systems in these countries were nationalised and most set the Russian system as an example [Husén and Postlethwaite 1994]. One of the aims of

these reforms was to create a comprehensive school system which could provide every citizen with a complete elementary general education. These new established national educational systems, although with several nations specific characteristics, had a comparable structure over the Eastern European nations [Kurian 1988, Apanasewicz and Rosen 1963, Braham 1970, Wulff 1992, *International...* 1984]. Primary education in all nations took around 7 to 9 years. In Czechoslovakia and Hungary people stayed in school from the age of 6 to 14-15, and in Poland and Bulgaria from 7 to 14-16. Completion of primary school gave access to vocational schools or entrance to examinations of general secondary schools (technical or gymnasium). General secondary education in Eastern European nations took about 4 years (gymnasium or technical secondary education) and after completion a state examination was requested to apply for university. The vocational schooling channel or apprenticeship training channel took on average between 2 to 4 years. These vocational channels gave in principle the possibility to enter university, however these kind of educational careers proved to be rare. Most students registered at university came from a form of general secondary education. Their higher education subsequently took 2 to 4 years (college) or 4 to 6 years (university).

During the post-war period the educational systems in all Eastern European nations showed major developments. One of the most striking was the increase in the number of people enrolled in educational institutions. To a large extent this was due to the growing size of birth cohorts. However the expansion of the educational system was also caused by a considerable rise in the proportions of people from the birth cohorts that went to school. This growth in proportions did not occur as much in primary education, since the proportions were already around 100% at the beginning of the post-war period. The major growth in the proportions of people registered in schools occurred in higher education institutions. As is clear from Figure 1, based on data from the United Nation's statistical yearbook (UN several years), the percentages enrolled in general secondary education increased from around 35 % to around 70% in the five nations over the post-war period. Furthermore, the proportion of people in a certain cohort that were enrolled in a institute for tertiary education has risen from around 8 to 15 percent.

Since 1948 the state socialist regimes in Eastern European countries studied made serious attempts to reduce social reproduction. Among other approaches, they tried to do this by actively increasing schooling opportunities for the children of families in lower social positions and decreasing these opportunities for children of families in higher positions. For example, primary and secondary education was normally free for everyone and scholarships were established for low income class children. In addition, the length of compulsory education in these nations was extended from a 7 year average around 1950 to about 10 years around 1980 [Apanasewicz and Rosen 1963, Buti 1967, Wulff 1992, *International...* 1984, Deighton 1971]. Furthermore, especially in the 1950s, admission to secondary and higher education was based on social class quota. For example, in Poland special higher education entry courses were established for students of manual background who did not complete secondary education. Together the educational policies, led a much higher participation of pupils with a manual origin in the institutes for higher education [Archer 1972, Apanasewicz and Rosen 1963, Braham 1970, *International...* 1984]. However, the policy measures on education taken by the Communist regimes were not always as severe as suggested. In most countries the policies were particularly upheld in the 1950s, the period of orthodox Communism, but much weaker in later decades [Gerber and Hout 1996].

Figure 1. Enrollment in secondary (above) and tertiary (below) education in five East European nations



Data and operationalisations

In order to examine the mechanisms of educational reproduction in Eastern nations, data from respondents (N = 13,997) are to be analysed from a large-scale survey held in five countries, namely Bulgaria (N = 2,898), the Czech Republic (N = 3,168), Hungary (N = 2,785), Poland (N = 2,072) and Slovakia (N = 3,074),¹ and a research design is applied that uses cohorts as baseline units of historical comparison. The survey data analysed consist of rather large-scale samples (about 5,000 respondents in each nation) of the general population in 1993. The data are collected within the project 'Social Stratification in Eastern Europe after 1989', directed by Ivan Szelenyi and Donald J. Treiman [Treiman and Szelenyi 1993a, 1993b], in collaboration with researchers from the nations surveyed, the United States and the Netherlands. When collecting the data similar sampling designs and questionnaires were used, and internationally comparable coding schemes applied. So, the data are highly comparable across the nations.

The surveys of the different nations differ somewhat in the age restrictions of the selected respondents. To make the data as comparable as possible, and to be sure that (almost) all respondents had finished their educational careers, we selected in all nations respondents being between 28 and 67 years of age at the time they were interviewed, and thus excluded the youngest and eldest respondents. Since the data were collected in 1993, these age restrictions provide us with information on the process of educational attainment for the cohorts which attended school around 1940 (our oldest respondents) to the cohorts that attended school around 1979 (our youngest respondents). Consequently, a cohort design offers a unique opportunity to examine long-term historical trends in educational reproduction.

¹) Within the Szelenyi and Treiman project a survey was also held in Russia, but the educational data from this survey were not adequately available to us.

In the analysis the data are divided into four ten-year wide cohorts, which constitute the baseline units of our historical comparison. These cohorts have a value for their midpoints which corresponds to the year when the members of the cohort were on average 14 years of age (i.e. we coded cohort as: cohort = year of birth + 14). We take this value, as it is around this age that major decisions on educational careers are taken and that particular year is the best approximation to historical contexts (such as war and revolution) associated with educational careers.

For respondent's education we use the CASMIN classification schema of qualification levels as first given by Koenig et al. [1988]. In this classification schema the different educational categories were defined as to reflect to the greatest extent possible the typical, class-specific barriers in the educational system and grasp the differentiations in the educational courses and certificates that are relevant in the labour market [Müller and Karle 1993]. In this paper we combined some of the nine original educational levels in line with Matějů [1990] and distinguished between the four levels that are given in Table 1. In order to create a variable that measures respondent's final level of education attained, i.e. the highest level completed, we recoded our educational categories into the approximate years of schooling it took for them to complete that level. Doing this, we made use of the information provided by the original investigators of the dataset.

Table 1. Description of Educational Qualification Variables for five Eastern European Nations

Level of Education	Casmin categories	Description
1. Less than lower secondary	0	No Schooling
	1a	Incomplete primary education
	1b	Completed (compulsory) primary education
2. Lower secondary	1c	Completed primary education and basic vocational training
	2a	Secondary, incomplete, no certificate
3. Complete general secondary	2b	Secondary vocational qualification
	2c	Secondary academic certificate (e.g. matura)
	2c	Higher education, incomplete, no certificate/degree
4. Tertiary	3a	Higher education, tertiary certificate/degree
	3b	Higher education, post-graduate study

As discussed above, people's final level of education can also be considered as a series of grade progression through they move. At all successive transitions a proportion of respondents have success, whereas the remaining proportion of others fail. Using our educational classification the first transition can be considered as a failure for those who finished only primary education or less, whereas those who continued towards a specific qualification level beyond primary education are considered successful. In the second transition, those who were successful at the first transition are divided into two groups – people who only get a basic level of secondary education (failure) and persons who get entrance into complete secondary education (success). Finally, at the third transition among those who reached full secondary education, those who finish some form of terti-

ary education are considered as successes and those who leave school with only full secondary education are regarded as failures.

Parental background enters the analysis as three variables. We first measure parental background by the parents' level of education (measured in years of schooling), i.e. as the average number of years it took the mother and father to complete their highest level (min-max: 0-20). This highest level of schooling completed was recoded into the approximate years of education using expert judgements. Secondly, the parental background is indicated by the parents' social economic status measured by the International Socio-Economic Status Index [Ganzeboom, De Graaf and Treiman 1992] (min-max: 1.6-9.0). Thirdly, in order to assess the value of the parents' political resources allocated for their children's educational career, a dummy variable for the parents' membership of the Communist political party membership was constructed. In our dataset, an average of 33 percent of the respondents in the Czech Republic, and between 18 to 21 percent in the remaining countries indicated that one (or both) parents had been a member of a Communist political party.

In order to control differences in educational attainment between men and women, in our analyses we use a dummy variable (1 = woman, 0 = man). Furthermore, differences in processes of educational attainment between people from rural and urban areas are taken into account by using an ordinal variable for degree of urbanisation (1 = low, 5 = high).

Table 2 shows that our survey data captures long-term social demographic and modernisation trends in Eastern Europe. Structural occupational mobility decreased the size of the farming class and increases the size of the professionals and industrial labourers. This resulted in an increase in parents' ISEI. Besides, the level of education of people and their parents' increased significantly over the distinguished period. In addition, more and more people live in urbanised areas, especially after the fifties. Parents' partymembership was rare among the first cohort and increased over time; possible simply because parents of older respondents had less time to become a member of a Communist party during their lives.

Models of educational stratification

Linear Model of Highest Level Completed

Two types of models have been applied to model the relationship between social background and educational attainment for the research on social stratification. The first model is the 'Linear model of highest level completed'. This model was introduced by Blau and Duncan [1967] and assumes that educational attainment, as a dependent variable, can be represented adequately by a metric variable (for example years of schooling) and that the relation between social background variables and successive levels of educa-

Table 2. Means and Standard Deviations (between brackets) for Variables in the Educational Attainment Model in five Eastern European countries by cohort, 1940-1979

	All	Cohort			
		1940-49	1950-59	1960-69	1970-79
<i>Bulgaria</i>					
Parent's education	5.6 (3.9)	3.5 (3.1)	4.7 (3.4)	6.1 (3.8)	7.4 (4.0)
Parent's ISEI	3.2 (1.4)	2.7 (1.1)	2.9 (1.2)	3.4 (1.5)	3.7 (1.6)
Parents partymember	0.2 (0.4)	0.1 (0.4)	0.2 (0.2)	0.2 (0.4)	0.3 (0.4)
Female	0.5 (0.5)	0.5 (0.5)	0.5 (0.5)	0.5 (0.5)	0.5 (0.5)
Urban (at 16)	2.7 (1.4)	2.5 (1.4)	2.5 (1.4)	2.9 (1.4)	2.9 (1.4)
N (listwise deletion)	2,898	608	683	850	757
<i>Czech Republic</i>					
Parent's education	9.6 (1.9)	8.7 (1.7)	9.1 (1.7)	9.9 (1.9)	10.4 (1.9)
Parent's ISEI	3.7 (1.4)	3.3 (1.2)	3.5 (1.3)	3.9 (1.5)	4.2 (1.4)
Parents partymember	0.3 (0.5)	0.2 (0.4)	0.3 (0.5)	0.4 (0.5)	0.3 (0.5)
Female	0.5 (0.5)	0.6 (0.5)	0.5 (0.5)	0.5 (0.5)	0.5 (0.5)
Urban (at 16)	2.5 (1.4)	2.4 (1.5)	2.4 (1.4)	2.5 (1.4)	2.5 (1.4)
N (listwise deletion)	3,168	755	646	932	835
<i>Hungary</i>					
Parent's education	7.2 (3.0)	5.5 (2.5)	6.5 (2.9)	7.6 (2.9)	8.4 (2.9)
Parent's ISEI	3.4 (1.4)	2.8 (1.2)	3.1 (1.4)	3.5 (1.4)	3.7 (1.5)
Parents partymember	0.2 (0.4)	0.1 (0.3)	0.2 (0.4)	0.2 (0.4)	0.2 (0.4)
Female	0.5 (0.5)	0.6 (0.5)	0.6 (0.5)	0.5 (0.5)	0.5 (0.5)
Urban (at 16)	2.8 (1.5)	2.7 (1.5)	2.8 (1.4)	2.9 (1.5)	2.7 (1.4)
N (listwise deletion)	2,785	564	612	814	795
<i>Poland</i>					
Parent's education	7.5 (3.2)	5.6 (3.7)	6.5 (3.1)	7.5 (2.9)	8.7 (2.7)
Parent's ISEI	3.3 (1.3)	2.8 (1.1)	3.1 (1.3)	3.3 (1.4)	3.5 (1.4)
Parents partymember	0.2 (0.4)	0.1 (0.2)	0.1 (0.3)	0.2 (0.4)	0.2 (0.4)
Female	0.5 (0.5)	0.6 (0.5)	0.5 (0.5)	0.5 (0.5)	0.5 (0.5)
Urban (at 16)	2.5 (1.3)	2.5 (1.4)	2.5 (1.4)	2.6 (1.3)	2.5 (1.3)
N (listwise deletion)	2,072	299	403	600	770
<i>Slovakia</i>					
Parent's education	8.7 (2.1)	7.4 (1.6)	8.0 (1.8)	8.7 (1.9)	9.6 (2.1)
Parent's ISEI	3.4 (1.4)	2.8 (1.2)	3.1 (1.3)	3.5 (1.4)	3.9 (1.4)
Parents partymember	0.2 (0.4)	0.1 (0.3)	0.1 (0.3)	0.2 (0.4)	0.2 (0.4)
Female	0.5 (0.5)	0.6 (0.5)	0.5 (0.5)	0.5 (0.5)	0.5 (0.5)
Urban (at 16)	1.9 (1.2)	1.8 (1.2)	1.8 (1.2)	1.9 (1.2)	2.0 (1.3)
N (listwise deletion)	3,074	509	580	969	1,016
<i>All Nations</i>					
Parent's education	7.8 (3.2)	6.3 (3.1)	7.0 (3.1)	8.0 (3.0)	9.0 (2.9)
Parent's ISEI	3.4 (1.4)	2.9 (1.2)	3.1 (1.3)	3.5 (1.4)	3.8 (3.8)
Parents partymember	0.2 (0.4)	0.1 (0.3)	0.2 (0.4)	0.2 (0.4)	0.2 (0.4)
Female	0.5 (0.5)	0.6 (0.5)	0.5 (0.5)	0.5 (0.5)	0.5 (0.5)
Urban (at 16)	2.5 (1.4)	2.4 (1.5)	2.4 (1.4)	2.5 (1.4)	2.5 (1.4)
N (listwise deletion)	13,997	2,735	2,924	4,165	4,173

Note: For descriptions of variable codings, see text.

tional attainment is linear [see also Blau and Duncan 1967, Ganzeboom and Nieuwebeerta 1996]. In this model, the highest level of schooling (measured in number of years of schooling) for individual i in cohort c (Y_{ic}) is taken as dependent variable, and social origin variables (X_{oic}) as independent explanatory variables:

$$Y_{ic} = \beta_{oc} + \sum \beta_{oic} X_{oic} + \varepsilon_i \quad (1)$$

This implies that in each cohort c the effect of a certain social origin variable on the highest level completed – i.e. the effect of a unit shift in X_{oic} on Y_{ic} – equals to the value of the β_{oc} -parameter in that cohort. Changes in the β_{oc} -parameter over cohorts, therefore, represent changes in inequality of educational opportunity in a society [see e.g. Hauser and Featherman 1976].

Logistic Response Model of School Continuation

The second model is a ‘logistic response model of school continuation’. This model, that was introduced by Mare [1980, 1981] and – for example – applied in the volume edited by Shavit and Blossfeld [1993], separates the educational career into a set of successive transitions between levels of education. At each transition, people having made all the preceding transition, have a probability to be successful in that transition. In the ‘logistic response model of school continuation’ the log odds of being successful in a transition is regressed on social background variables:

$$\log_e (p_{itc}/(1 - p_{itc})) = \lambda_{0tc} + \sum \lambda_{oic} X_{oic} \quad (2)$$

where p_{itc} is the probability of the i th individual in the c th cohort of continuing from the $(t - 1)$ st to the t th schooling level, and X_{oic} the value of the o th social background variable for that individual in that cohort. Here, the λ_{0tc} is a constant and gives the mean log odds of grade progression in the reference category; and the λ_{oic} denotes the effect of a unit change in X_{oic} on the log odds of grade progression. Changes in the λ_{oic} -parameter thus represent changes in the effects of social background on educational opportunities. If the logistic model is properly specified and fits the data reasonably well, estimates of the parameters of this model are invariant under changes in the marginal distributions of the variables in the model. In other words, the effects of social origin on school continuation probabilities of a country are independent from changes in the educational distribution of that country.

The two models combined

At first sight the two models above discussed might seem totally different and unrelated. However, Mare [1981] showed that there is a direct link between the two models. He demonstrated that the ‘logistic response model of school continuation’, provides a specification of the proportions of people who are successful in making the distinguished educational transition (p_{itc}), and that the effect of a unit change in background variable X_{oic} on the final level of education completed (measured in years of schooling) (Y_{ic}), can be expressed as follows:

$$\delta Y_{ic} / \delta X_{oic} = \beta_{oc} = \sum_{k=1}^K [\sum_{j=1}^k \lambda_{oic} p_{itc} (1 - p_{itc}) \prod_{l=t}^k p_{lkc}] \quad (3)$$

where λ_{oic} represents the effect of background variable X_{oic} in the c th cohort on log odds of grade progression from level of schooling $t-1$ to level of schooling t ; and p_{itc} stands for

the proportion of people – out of those who completed at least $t-1$ levels – who are successful in making the educational transitions from level $t-1$ to level t ; and p_{lc} represents the proportion of people – out of those who completed at least $l-1$ levels – who are successful in making the other (non- t) educational transitions from level $l-1$ to level l , when the immediately progressing level is finished (i.e. school continuation probabilities). Thus, this equation shows that the values of the β_{oc} -parameters depend both upon the marginal distribution of education in a cohort (i.e. the p_{lc} and p_{tc} parameters), and the effects of the social background variables on school continuation probabilities in that cohort (i.e. the λ_{otc} parameters) [see also Smith and Cheung 1986].

The properties of equation (3) therefore enable us to address our last research question, i.e. to examine (1) what the consequences of changes in the educational distribution are and (2) what consequences the changes in the effects of parental background on school continuation probabilities at different school transitions have on the effects of parental background on final educational attainment in Eastern European nations.

Educational expansion

The central aim of this paper is to examine trends in intergenerational transmission of education in Eastern Europe. However, we address our first question and describe changes in the educational distributions in Eastern European nations over the 1940-1979 period. In general, the conclusions of our description of educational expansion patterns in these nations are in accordance with earlier descriptions [see e.g. Shavit and Blossfeld 1993].

In the beginning of the 1940-1979 period significant differences between the nations existed in the average number of years of schooling and in the distribution of the levels of schooling. Around 1940 the mean level of education in the Czech Republic was the highest (about eleven years) and in Poland the lowest (about nine years). The figures in Table 3 show that around 1945 in general in all socialist nations (except Czechoslovakia) more than thirty percent of the people finished no more than primary school, about sixty percent finished some kind of secondary education, and about ten percent finished some tertiary education. However, significant differences in the educational distributions obviously existed between the nations. For example, in the Czech Republic only about twenty percent finished no more than primary school, whereas more than thirty percent did in the other countries.

The figures also show that educational expansion occurred in all nations. This expansion is characterised by a decrease in the proportion of people having finished only primary education, and a significant increase in the proportion of persons having completed some kind of secondary education. On average, the proportion of people finishing some type of secondary education around 1975 had risen to about seventy-five percent, whereas the proportion of people having finished only primary education had decreased to about ten or twenty percent. It is to be noted, however, that rising levels of education in the socialist nations did not imply fast growing proportions of people having finished some kind of tertiary education. This proportion remained fairly stable and had increased only from about ten percent to about fifteen percent over the 1945-1975 period.

The patterns of educational expansion have important consequences on people's chances to be successful in continuing their educational career in distinguished school transitions, i.e. the p_{tc} parameters in equation (3). For example, the increase of the per-

centage of people having secondary education implied a large increase in the proportions of people successful in the first transition. Around 1945, the chances to finish at least some kind of lower secondary education differed between forty percent in some nations and eighty percent in others, whereas around 1975 these chances were about eighty percent in all nations. For instance, in Bulgaria and Poland the chances to complete some additional defined qualification rose from about fifty to eighty percent. For Hungarian people these chances rose over the same period from about seventy to eighty percent, and for Czech and Slovak people from eighty to ninety percent. At the second transition people are divided into those who only get a basic level of secondary education and those who enter complete secondary education. The chances of success in this transition in the socialist nations (but Bulgaria) have remained rather stable over the period under investigation. The chance to be successful in this transition was about fifty in most countries and about ninety in Bulgaria. Furthermore, at the third transition those who reached full secondary education, had on average a chance of around forty percent to finish some form of tertiary education. The data show that again these chances were rather stable at about forty percent over the period under investigation, although in Hungary this chance was somewhat higher in the first cohorts (i.e. around fifty percent), and lower in Bulgaria in the more recent cohorts.

Table 3. Educational distribution in five Eastern European countries by cohort, 1940-1979

	All	Cohort			
		1940-49	1950-59	1960-69	1970-79
<i>Bulgaria</i>					
Less than lower secondary	39	63	49	32	19
Lower secondary	6	6	7	7	5
Complete general secondary	44	24	35	49	62
Tertiary education	11	7	9	12	14
<i>Czech Republic</i>					
Less than lower secondary	20	33	24	14	10
Lower secondary	43	42	41	45	44
Complete general secondary	27	18	25	31	33
Tertiary education	10	7	9	10	13
<i>Hungary</i>					
Less than lower secondary	37	66	48	26	20
Lower secondary	25	14	20	28	34
Complete general secondary	24	12	20	31	30
Tertiary education	13	8	12	15	16
<i>Poland</i>					
Less than lower secondary	31	63	47	25	14
Lower secondary	28	11	17	30	39
Complete general secondary	31	19	25	34	38
Tertiary education	10	7	12	11	10
<i>Slovakia</i>					
Less than lower secondary	24	52	34	18	11
Lower secondary	34	23	31	36	38
Complete general secondary	31	17	26	34	37
Tertiary education	12	8	9	12	15

Effects of parental background on final educational attainment

The second question concerns the descriptive issue of whether the patterns of educational inequality have changed over the 1940-1979 period in Eastern Europe. To begin with, we examined the changes in the effects of parental background on final educational attainment employing the 'Linear Model of Highest Level Completed'. In this model, respondent's final educational attainment, measured in years of schooling, was regressed on parental background variables. In our analyses the data were pooled over the nations.² In order to control in our models for the sex- and nation-specific growth in the average years of schooling, in addition to the model's intercept, dummy variables were included in the model for the distinguished sex-nation-cohort combinations. Furthermore, a measure of the degree of urbanisation was included to take account of differences in educational attainment between urban and rural areas. To examine how the effects of parental background changed over the cohorts, two versions of the 'Linear Model of Highest Level Completed' were applied. The first version allows for non-linear trends by using dummies for the distinguished cohorts. In the second version of the model the cohort variable was included as ordinal variable, and thus this model tests for linear trends.

The parameter estimates of both versions of the 'Linear Model of Highest Level Completed' are presented in Table 4. These figures give a precise picture of the effects of parents' education, occupational status and partymembership on final educational attainment in Eastern Europe in the 1940-1979 period. Due to our coding procedure, in the 'Non-linear Trend Model' the parameters for the effects of parental background variables represent these effects in each of the distinguished cohorts, and in the 'Linear Trend Model' the parameters refer to these effects around 1945. The coefficients for the various variables are significant and differ between the nations. The coefficients for the effects of parents' education vary between 0.333 in the Czech Republic and 0.598 in Slovakia. Furthermore, the coefficients for the effects of parents' social economic status vary between 0.238 in Bulgaria and 0.551 in Poland. In the international perspective these effects can be regarded as rather large [cf. Ganzeboom and Treiman 1993]. On average these results square with conclusions drawn in earlier studies that Communist regimes have not totally succeeded in diminishing the intergenerational transmission of status in education.

However, in all nations the effects of parental background have decreased over the 1940-1979 period. The linear trend parameters, representing the change in the effects of parental background variables per 10 years, have for all nations and variables (with the exception of the trend parameter for parents' partymembership in Poland) a negative value. These imply that in the first cohort (people who entered the educational system around 1940) the social origin effects were larger than for people in the last cohort (who entered around 1975). Thus, in all these nations the advantages for children from higher social background have gradually diminished over that period. The trends are not linear in all nations, but in general the decline is systematic in all.

²) All analyses in this paper were also done using separate datasets for each nation. However, since these analyses yielded similar results, it was decided not to present them in the text.

Table 4. Selected parameters of 'Linear model of highest level completed': five Eastern European countries by cohort, 1940-1979

	Nonlinear Trend Model				Linear Trend Model	
	Effect of Origin				Effect of Origin	Linear Trend
	1940-49	1950-59	1960-69	1970-79	in 1945	Change/10 years
<i>Parent's education</i>						
Bulgaria	0.47**	0.43**	0.43**	0.31**	0.482**	-0.047**
Czech Republic	0.37**	0.31**	0.26**	0.37**	0.333**	-0.002
Hungary	0.48**	0.48**	0.44**	0.40**	0.493**	-0.028
Poland	0.34**	0.31**	0.30**	0.28**	0.333**	-0.018
Slovakia	0.63**	0.47**	0.33**	0.23**	0.598**	-0.124**
<i>Parent's ISEI</i>						
Bulgaria	0.31**	0.16	0.04	0.14*	0.238**	-0.056
Czech Republic	0.49**	0.41**	0.38**	0.20**	0.494**	-0.086**
Hungary	0.47**	0.37**	0.27**	0.28**	0.437**	-0.062**
Poland	0.42**	0.58**	0.36**	0.27**	0.551**	-0.090
Slovakia	0.59**	0.34**	0.38**	0.42**	0.479**	-0.035
<i>Parents partymember</i>						
Bulgaria	1.38	0.71**	0.90**	0.30	1.281**	-0.304**
Czech Republic	0.68**	0.05	-0.27	0.29	0.326	-0.114
Hungary	0.54	0.35**	0.01	0.15	0.418	-0.126
Poland	0.67	-0.37	0.52*	0.45*	0.089	0.121
Slovakia	0.83**	0.41	0.48**	0.07	0.706**	-0.185

Note: For descriptions of variable codings, see text.

* p < 0.10; ** p < 0.05

Effects of parental background on school continuation probabilities

Model selection

Our third question concerns the impact of parental background on respondents' school continuation probabilities in each transition, and how this effect has changed in Eastern Europe over the 1940-1979 period. To answer this question we employed the 'Logistic Response Model of School Continuation', assuming the log-odds to be successful versus not to be successful in a certain transition to be dependent on social background variables. Following the approach as that used by Hout and Raftery [1993], Müller and Karle [1993] and Gerber and Hout [1996] a dataset was analysed containing pooled information from all three transitions, i.e. for each transition a datafile was created containing those respondents being at risk – who survived all previous transitions – and these datafiles were merged. In the models in order to control for varying success rates across transitions (T), nations (N), men and woman (W), degree of urbanisation (U) and cohorts (C), these variables and their five way interactions (Z(d)) were included. To test whether the effects of parental background differed significant across transitions, nations and cohorts, several variations of the 'Logistic Response Model of School Continuation' were applied. Likelihood-ratio tests (L^2) [for more information see Gerber and Hout 1996] are used to detect

whether the fits of the models differed significantly.³ The goodness-of-fit statistics are presented in Appendix A1. The results from the comparisons of these models' fit-statistics, indicates that Model 14 represents the data best. This model assumes that the parental background variables have a significant effect on school continuation probabilities and that the strength of these effects differed across the distinguished transitions. Furthermore, this model allows the effect of parental background on school continuation probabilities to differ between nations and cohorts in the first and second schooling transition. In addition, it assumes that at the third transition the origin effect are constant over all nations and cohorts.

Effects of parental background

The estimated parameters for the effects of parental background variables on school continuation probabilities of Models 14 are presented in Appendix A2. However, due to the specification of this model, these parameters do not provide a clear picture of the effects of peoples' origin in each country and cohort. Therefore, in Table 5 we present the calculated effects of the three parental background variables at the three schooling transitions for all nations and cohorts. Clearly, for all three variables the positive value of the effect parameters indicate that people whose parents had a higher education and social status and who were member(s) of the Communist political party had higher chances to succeed in continuing their educational career at the transitions.

The first set of parameters represents the effect of parents' education on the log-odds to be successful in the first schooling transition. These effects differ between the nations, where Poland shows the lowest effects (0.19) and the Czech Republic on average the highest (0.36). In general the effects of parents' education are stable over time. Only in Hungary the effect differ between cohorts, i.e. the two most recent cohorts show somewhat higher effects (0.34 and 0.40) than in the two oldest cohorts (0.27). The effects of parents' social economic status is stable in all five nations. In Bulgaria and Hungary these effects are the weakest (0.13) and in the Czech Republic and Slovakia the strongest (0.35), and in Poland (0.24) they hold an intermediate position. The effects of parents' partymembership on chances of success in the first transition are strongest in Bulgaria (0.65), and on average weakest in Hungary and Poland (0.08). In the Czech Republic the

³) To reach a preferred model, we followed the set modelling procedure similar to that of Gerber and Hout [1996]. The first step (A) involved entering background variables. To begin with we employed a model including only control variables and their interactions (model 1). These controls were included as separate dummies corresponding to the distinguished combinations. Subsequently, variables for parents' status, parents' education and parents' partymembership were entered (model 2), and the background x transition interactions (model 3).

In the next steps we examined whether the effects of parental background at the different transitions differed across the nations and whether these effects changed over cohorts. We proceed one transition at a time (Step B, C and D in Appendix A1), and for each transition we focus on subsequent cross-country differences (Step B1, C1 and D1) and on changes over time (Step B2, C2 and D2). In each step, first interactions between each background variable, transition, and nation or cohort are entered. Second, we adjusted the dummy specification so that within each respective set of interactions the omitted category is either the highest of the lowest. This allows us to evaluate the statistical significance of the interaction. Subsequently, the insignificant interactions were excluded from the model. Finally, in order to provide a more parsimonious model, those interactions that are significant were re-specified in a 'linear' way.

effect of parents' partymembership starts off at a relatively low level and after a decrease, increases in the last cohort (0.43). In Slovakia these effects were exceptionally strong in the first cohort (1.09) but took an intermediate level in the more recent cohorts.

The pattern of effects of parental background variables on school continuation probabilities in the second and third transition is less complicated. First, there are hardly any differences between nations as far as the strength of these effects is concerned. The only exception is that the effects of parents' education on school success in the second transition in Slovakia is stronger (0.24) than in the other nations (0.16). Furthermore, the effect of parents' education, occupational status and partymembership did not change over time in the Eastern European countries studied. The Czech Republic forms the only exception, with a stronger effect of parents' education in the last cohort (0.38) than in the first three cohorts (0.16). Thus, there is generally no indication that effects of parental background on school continuation probabilities have changed, and certainly no indication that these have diminished during the post-war period.

However, we find that the effects of parental background in the second and third transition are somewhat slighter than those in the first transition. Furthermore the effects of parents' status are slighter in the third transition than in the first and the second. Our findings thus are in accordance with results from earlier studies on social stratification in the Communist nations [Peschar 1990, Shavit and Blossfeld 1993, Gerber and Hout 1996] and in other industrialised nations [Mare 1980, Shavit and Blossfeld 1993].

Explaining variation in effects of parental background on final educational attainment

At first sight the results from the preceding two sections seem contradictory. On the one hand, the effect of parental background (especially parents' education and social status) on final level of education attained (measured in years of schooling) has decreased in the five Eastern European nations under investigation over the 1940-1979 period. On the other hand, the effects of parental background variables on school continuation probabilities in school transitions were stable or have increased over that period. However, as Mare [1981] already revealed, these seemingly contradictory findings might result from an important development in these nations, i.e. the substantial expansion of education.

Therefore, we now address the fourth and last question of this paper which reads: what were the consequences of (1) changes in the distribution of education and (2) changes in the effects of parental background on school continuation probabilities at different school transitions, on the effects of parental background on final educational attainment in Eastern European nations? To answer this question we employ the method developed by Mare [1981], and calculate hypothetical values for the effects of parental background variables on final educational attainment (measured in years of schooling) in three counterfactual situations, using equation (3) presented earlier in this paper.⁴ In order to keep the analyses simple, the analyses will be restricted to the effects of parents' education, and will not discuss results on the effects of parents' occupational status and partymembership. The calculated values of the effect of parents' education are presented in Table 6.

⁴ In order to come up with results applying Mare's method of examining the effects of parental background on respondent's final educational attainment, we multiplied the outcomes of equation (3) by three [see Mare 1981: 78, fn. 2].

In the first counterfactual situation (A), it is assumed that the grade progression rates changed over time (p_{tc}), whereas the association between parents' education and grade progression were constant (λ_{ot}) – i.e. had the values of the effect parameters of Model 14 presented in Table 6. This shows the 'pure' consequences of educational expansion on educational inequality in Eastern Europe over the period under investigation. The obtained figures show that under these conditions the effects of parents' education would have decreased substantially. For example, in Bulgaria the effect would have taken the value of 0.45 in the first cohort (1940-49) and 0.35 in the last cohort (1970-79). Similar patterns reveal for the other nations, although in Hungary the decrease is less pronounced. The declines in the effects are also illustrated by estimated trend parameters given in Table 6. To obtain these trend parameters, for each nation a linear regression was performed on the presented counterfactual effect parameters with the mean year of the cohorts as independent variable. For all nations these trend parameters have a negative value which is even statistically significant in the Czech Republic and Slovakia. So, if no other mechanisms had been at work, educational expansion would have caused the effects of parents' education on final educational attainment to decrease substantially over the 1940-1979 period.

In the second counterfactual situation (B) it is assumed that the grade progression rates were constant over time (p_t), i.e. we gave them values set around 1945 in each nation, whereas the association between background variables and grade progression varied over the cohorts according to the parameters of model 14 in Table 5 (λ_{otc}). The obtained values of the effect parameters under these conditions show that in three nations the effects of parents' education would have remained stable over time. Furthermore, the obtained effect parameters show that in Czech Republic and Hungary the effect of parents' education would have increased in the last two cohorts. Thus, changes in the effects of parental background on school continuation probabilities at various transitions per se (i.e. under the condition of constant educational distributions) would have resulted in stable or increasing effects of parents' education on final educational attainment.

In the third counterfactual situation (C) the consequences of simultaneously changing educational distributions and effects of parental background on school continuation probabilities are examined. The grade progression rates were assumed to have changed over time (p_{tnc}), and the association between parents' education and grade progression were assumed to change according to the parameters of model 14 in Table 5 (λ_{otc}). The obtained values of effects of parents' education on final educational attainment show that in this counterfactual situation – that is almost identical to the empirical situation – these effects would have decreased in three nations, i.e. in the nations where the effects of parents' education on school continuation were stable (Bulgaria, Poland and Slovakia). Furthermore, the obtained values show that the effects would have increased over time. The speed of the decreases in these countries, however, would have been less pronounced than in a given situation where no changes in the educational distribution would have occurred (counterfactual situation B).

Concluding, the factual slight decreases in the effects of parents' education on final education attainment (measured in years of schooling) in Eastern Europe over the period 1945-1979 result from two offsetting influences. The stability and increases in the effects of parental background on school continuation probabilities in schooling transitions caused these effects to raise, whereas the substantial educational expansion in these na-

tions caused these effects to decrease substantially. A finding that very much resembles Mare's findings for the USA over the period 1907-1951 [Mare 1981].

Table 6: Results from counterfactual analysis: (A) Effects of origin (parent's education: years of schooling) on final educational attainment (years of schooling) under the conditions of stable associations between origin and school continuation probabilities, but varying educational distributions, (B) these effects under the conditions of stable educational distributions, but varying effects of origin on school continuation probabilities and (C) these effects under the condition of both varying educational distributions and effects of origin on school continuation probabilities.

Cohort	1940-49	1950-59	1960-69	1970-79	Linear Trend (N = 4)
<i>A: p varies over countries and cohorts, λ constant over cohorts</i>					
Bulgaria	0.45	0.49	0.45	0.35	-0.033
Czech Republic	0.47	0.46	0.37	0.34	-0.047*
Hungary	0.41	0.50	0.45	0.41	-0.005
Poland	0.32	0.38	0.33	0.28	-0.018
Slovakia	0.48	0.49	0.43	0.39	-0.033*
<i>B: p constant, λ varies over countries and cohorts</i>					
Bulgaria	0.45	0.45	0.45	0.45	.
Czech Republic	0.47	0.47	0.47	0.60	0.038
Hungary	0.41	0.41	0.49	0.56	0.054*
Poland	0.32	0.32	0.32	0.32	.
Slovakia	0.48	0.48	0.48	0.48	.
<i>C: both p and λ vary over countries and cohorts</i>					
Bulgaria	0.45	0.49	0.45	0.35	-0.033
Czech Republic	0.47	0.46	0.37	0.53	0.009
Hungary	0.41	0.50	0.52	0.52	0.034
Poland	0.32	0.38	0.33	0.28	-0.018
Slovakia	0.48	0.49	0.43	0.39	-0.033*

Note: significant at 0.10 level
 p = proportion of people who are successful in making transitions
 λ = effects of background variable, here: parental education

Conclusions

Research on the effects of parental background on educational attainment can be divided into the analysis of final educational attainment (commonly measured in years of schooling) and the analysis of school continuation ratios at different school transitions. In this paper, following Mare [1981], these two approaches are combined. First, analysing data from Treiman and Szelenyi's 'Social Stratification in Central Europe' surveys held in Bulgaria, the Czech Republic, Hungary, Poland, and Slovakia, the effects of parental background on final educational attainment are shown to have varied cross-nationally and declined in three of the nations over the 1940-1979 period. Second, it is established that the pattern of changes in these effects can be explained by two offsetting influences: stability or small increases in the effects of parental background on school continuation probabilities in schooling transitions have caused these effects to be stable or to raise,

whereas substantial educational expansion in these nations have caused these effects to decrease significantly.

There has been a debate on whether the final educational attainment or the progression rates should be under investigation when focusing on processes of social stratification in nations. In this paper we do not choose between these two sides. We feel that both tell their own story. It is interesting to know how great the effects of parental background are in each successive transition of people's educational career. However, since it is predominantly people's highest and completed level of education that will be the decisive factor for success in their occupational career, the effects of parental background on people's final educational attainment are also very relevant. Thus, if the effects of parental background decrease due to educational expansion in a given society, it has important consequences on the association between social origin and occupational status in that society (i.e. the pattern of social mobility).

Then there is the question of the extent to which the Communist regimes have been successful in reducing the effects of people's parental background and in creating more equalitarian and meritocratic societies. The implications of this paper's findings are not univocal. On the one hand, it is shown that the effects of parental background on school continuation probabilities have certainly not decreased – they have even increased – between 1940 and 1979. This thus suggests a complete failure of the destratification policy. However, it is also shown that the marked expansion of education in the Eastern European countries studied, has resulted in a substantial downward pressure on the effects of parental education on final educational attainment. Since the educational expansion in these nations can be seen as a result from Communist educational policy, it is possible to argue that in this way the Communist regimes were successful in reducing inequalities in education. Nevertheless, this success seems to have been more an unintended consequence of general educational policy, and not an intended consequence of specific destratification policy.

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Note to Appendix A1: W = Woman (male = 0, female = 1); U = degree of Urbanisation (1=low, ..., 5= high); C = cohort; T = transition; N = nation (1=bul) (2=czr) (3=hun) (4=pol) (5=slo); Z(d) = WUNCT and all lower interactions. E = parent's education (average); S = parent's status; P = parents member of communist party (no = 0, yes= 1); (d) indicates dummy variable specification of the variable in question; otherwise specification is ordinal. T1, T2, T3 refer to dummy specifications of transition where the respective transition equals 1. Number of respondents = 13,997.

Appendix A2. Selected Parameters of 'Logistic response model of school continuation' (model 14)

Variable	b	s.e.	p
Parent's education	0.189	0.020	0.000
Parent's education * Trans2	-0.027	0.025	0.276
Parent's education * Trans3	-0.032	0.026	0.220
Parent's ISEI	0.133	0.033	0.000
Parent's ISEI * Trans2	0.161	0.040	0.000
Parent's ISEI * Trans3	0.017	0.042	0.692
Parents partymember	-0.209	0.133	0.115
Parents partymember * Trans2	0.328	0.145	0.024
Parents partymember * Trans3	0.328	0.150	0.029
For Trans1:			
Parent's education * country (4=0)(1,5,3=1)(2=2)	0.085	0.020	0.000
Parent's education * hun * cohort (1,2=0)(3=1)(4=2)	0.063	0.023	0.006
Parent's ISEI * county (1,3=0)(4=1)(2,5=2)	0.108	0.025	0.000
Parents partymember * country (2=0)(3,4=1)(5=2)(1=3)	0.287	0.070	0.000
Parents partymember * czr * cohort (1,2=1)(3=0)(4=2)	0.321	0.149	0.031
Parents partymember * slo * cohort (1=1)(else = 0)	0.729	0.360	0.043
For Trans2:			
Parent's education * slo	0.080	0.031	0.011
Parent's education * czr * cohort(4=1)(else=0)	0.215	0.060	0.000

Note: For descriptions of variable codings, see text.

The estimated Z(d) parameters are not given.