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Educational Expansion and Educational Reproduction in Eastern Europe, 1940-1975

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The paper considers changes in the effects of parent's education on educational attainment in five East European nations (Bulgaria, Czech Republic, Hungary, Poland, and Slovakia) over the period 1940-1975. It analyzes data on male respondents (n = 7,969) from Treiman and Szelenyi's surveys on 'Social Stratification in Eastern Europe' that were held in these countries. The paper shows a small but consistent decline in the effects of father's education on final educational attainment (measured in years of schooling). On the other hand, it reveals a rise in the effects of parental background on continuation probabilities at schooling transitions over the same period. Applying a method developed by Mare (1981), the paper demonstrates that the small decreases in the effects of father's education on final educational attainment result from two offsetting influences. The increases in the effects of parental background on school continuation probabilities at schooling transitions caused these effects to rise, whereas the substantial educational expansion that occurred in these nations caused these effects to decline.

Introduction

The role of education in the process of status attainment has become more and more important in modern industrialized societies. Accordingly, social stratification researchers have given considerable attention to the determinants and consequences of educational attainment. Studies on this topic were generally focused on Western industrialized countries. In contrast, studies on social inequality in Eastern Europe have been relatively scarce. During the communist period, totalitarian governments (especially in Bulgaria and Russia) did not allow social scientists to hold empirical stratification surveys or to publish their findings. This restrictive stance persisted despite forceful attempts in the former communist countries to create more egalitarian societies for more than 40 years. Obviously, it is important to find out how succesful these attempts have been.
The breakdown of communism in Central and Eastern Europe at the end of the eighties created opportunities for social stratification researchers to hold new cross-national surveys on social stratification there (see Treiman and Szelenyi, 1993a, 1993b). These surveys provide information on stratification patterns after the breakdown of communism. In addition, they disclose the patterns that prevailed under the stalinist and neo-stalinist

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methods of analysis employed in the studies. Traditionally, studies focused on the overall

regimes, since the surveys also collected retrospective data. Using that retrospective data, this paper examines changes in the way parental background affected educational attainment in five East European countries (Bulgaria, Czech Republic, Hungary, Poland, nd Slovakia) over the period 1940-1975. Furthermore, the paper explains why earlier studies on educational reproduction in Eastern Europe drew different conclusions.
In earlier studies, the conclusions on possible 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

effects of parental background on people's final attained level of education, commonly measured in total years of schooling. Those studies generally used linear regressiontechniques (Blau and Duncan, 1967). This approach yields a single indicator ofthe effect of social origin on final level of education. It can easily be determined whether this indicator has changed over time. Most of the studies using linear regression techniques reveal a decline in the effects of parental background over the past decades in Eastern European.
More recent, studies have considered educational attainment as a sequence of transitions within an educational career. These studies examined the effects of parental background on school continuation probabilities for each of these transitions (Mare, 1980, 1981; Simkus and Andorka, 1982). The reason why these studies take a different perspective is that the linear regression method has a drawback. It obscures the fact that the effects of parental background can differ across schooling transitions. Consequently, the indicators obtained from linear regression techniques are biased by the distribution of education in a society (Shavit and Blossfeld, 1993). This bias is especially relevant in Eastern Europe, where growth in attained levels of education has been both rapid and substantial. Studies employing school continuation probabilities for different transitions revealed hardly any decline in the effects of parental background over the past decades.
This paper re-examines the effects of parental background on school success in Eastern Europe. The changes in those effects are assessed by both methods of analysis, and a comparison of their results. This entails the analysis of data from large-scale cross-nationally comparable surveys that were held in these nations in 1993 as part of the international project "Social Stratification in Eastern Europe after 1989" (Treiman and Szelenyi, 1993a, 1993b). The research design takes cohorts as the baseline units of historical comparison. In addition, the outcomes of both methods are directly linked through a procedure developed by Mare (1981). That procedure specifies how shifts in educational distributions in East European countries are related to the way parental background influences educational attainment.
Summarizing, to detect possible changes in the way parent's education affects their children's educational attainment in Bulgaria, the Czech Republic, Hungary, Poland, and Slovakia, the following questions are posed:

1
To what extent did the distributions of education shift in East European nations over the period 1940-1975?

2
To what extent did the effects of parent's education on final educational attainment vary among the East European countries in the course of time over the period 1940-1975?

3
To what extent did the effects of parent's education on school continuation probabilities at different transitions in these countries change over the period 1940-1975?

4
What were the consequences of (1) shifts in the distribution of education and (2) changes in the effects of parent's education on school continuation probabilities at different school transitions for (3) the effects of parent's education on final educational attainment in these nations?

Theories of variation in educational stratification

The effects of parental background on educational attainment are consistently strong in all industrial societies. Parental background also has a high impact on education in Central and East European countries (Shavit and Blossfeld, 1993; Peschar, 1990, 1993; Mateju, 1990; Simkus and Andorka, 1982, Robert, 1991a, 1991b; Ganzeboom and Nieuwbeerta, 1996). However, many scholars argue that the effects of parental background have changed over time and differ among countries. Several theories have been advanced to explain these variations. This paper gives a brief overview of the four main explanations. For more extensive discussions, the reader is referred to Shavit and Blossfeld (1993) and De Graaf and Luijkx (1995). The theories are based on explanatory factors ranging from industrialization and modernization to policies for more egalitarian educational systems.
The first theory discussed here is *modernization theory*. The arguments comprising this (functionalist) theory have been presented by several sociologists but were given a systematic framework by Blau and Duncan (1967). The basic tenet of this theory is that the more modern and industrialized societies become, the more efficient labor has to be; that is, it must be carried out by the best available workers. Here, "best available" refers to talent and effort, not to ascribed characteristics derived from the worker's social background. Thus, according to this theory, modernization and industrialization of a society go together with a move from "ascription" to "achievement." This general notion of modernization theory is supplemented by Parsons (1970). He argued that the modernization of society is accompanied by a change in value systems. These evolve in the direction of more egalitarian political values. Others have claimed that changes towards more egalitarian political values and more objective needs for egalitarian opportunities are reflected in governmental policies. By means of scholarships and similar measures, governments in most industrial countries have lowered the financial and social thresholds in the education system. All in all, these points suggest that according to modernization theory, the influence of (ascribed) family characteristics on educational attainment declines with advancing modernization.
The *cultural reproduction (conflict) theory*, however, posits that the influence of social background will not decline with modernization. This theory emphasizes 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 favors children whose home life has imbued them with the cultural preferences and competences that are rewarded in school. This argument seems viable. 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 even in (modernized) societies where there are no financial constraints on participation in the educational system, an effect of people's social background will exist and could possibly be stronger than in less modernized nations. In light of this theory, it can be predicted that - certainly in later transitions - the effects of parental background will have remained stable

or will have increased over time.
The third theory discussed here is the *socialist transformation theory.* Its basic premise is that, certainly in their early days, socialist regimes in East European countries sought to create more egalitarian societies. Their policies probably reduced the effect of parents' resources on their children's education. After some years, however, the ruling (communist) elite tried to preserve the status quo for their own sake and that of their children (Mateju, 1990). Consequently, the effects of parental background on education will eventually become stronger.
The fourth theory is known as the *differentiated selectivity/educational expansion theory.* It predicts that as long as the level of education in a society keeps rising, the effects of parental background on continuation probabilities at transitions will increase. This prediction is based on the assumption that later schooling transitions are less selective in terms of parental background. At later transitions, students are more homogeneous with respect to factors that are intermediate between parental background and educational attainment, e.g. talent and motivation (Shavit and Blossfeld, 1993). Due to educational expansion, growing proportions of all social groups might reach higher levels of schooling. In that event, the higher transitions become more heterogeneous with respect to factors like talent and motivation. Then larger effects of parental background on school continuation probabilities may be expected. However, it is not clear whether or not the total effect of parental background on final educational attainment will decrease as well. This issue is that with educational expansion, more and more people reach higher transitions, where the effects of parental background are relatively smaller. This exerts a downward pressure on the total effect of parental background in that country.

Data and operationalization

In order to examine the mechanisms of educational reproduction in Eastern Europe, we analyzed data on male respondents (n=7,969) included in a large-scale survey held in five countries, namely Bulgaria, the Czech Republic, Hungary, Poland, and Slovakia. We used a research design that takes cohorts as the baseline units of historical comparison. The data that we analyzed consist of rather large-scale samples (about 5,000 respondents in each country) of the general population in 1993. The data were collected as part of the project "Social Stratification in Eastern Europe after 1989." That project was directed by Ivan Szelenyi and Donald J. Treiman (Treiman and Szelenyi, 1993a, 1993b). And the survey was conducted in collaboration with researchers from the five countries as well as from the United States and the Netherlands.
The survey instrument used for this project goes beyond the usual stratification and mobility survey (see Peschar, 1993). While there is much high-quality data on educational opportunities in Hungary and Poland and somewhat less in the Czech Republic and Slovakia, there is little in Bulgaria. Therefore, we attempt to draw Bulgaria into the pool of countries available for the comparative analysis of social stratification and social mobility. In addition, relative to earlier data, the data collected with this instrument are highly comparable across the countries. Similar sampling designs and questionnaires were used, and internationally comparable coding schemes were applied.
The surveys of the different countries differ somewhat in terms of the age restrictions placed upon the selected respondents. We intended to make the data as comparable as possible and to be confident that almost all male respondents had finished their educational

careers. To that end, we selected respondents who were between 30 and 69 years of age at the time they were interviewed. Thus, we excluded the youngest and oldest respondents. Since the data were collected in 1993, these age restrictions provide information on the process of educational attainment for a range of cohorts: those that attended school around 1940 (our oldest respondents) to those in school around 1975 (our youngest respondents).

To examine trends in intergenerational educational reproduction, the data were divided into five-year *cohorts*, which constitute the baseline units of our historical comparison. The midpoint of these cohorts corresponds to the year in which the members of the cohort were on average 14 years of age. In other words, we coded cohort as: cohort = year of birth + 14. We selected this value for two reasons. Around this age, people make major decisions on educational careers. Furthermore, this year is the best approximation of the historical contexts (such as war and revolution) that are associated with the educational careers. It is important to realize that the analysis of educational attainment using cohort data refers to events that took place a considerable time ago for most of the respondents. The "average" respondent made his major decisions around 1960, more than 30 years before the date of survey. The oldest respondents made these decisions around 1940 and the youngest around 1975. Consequently, the cohort designs used in this paper offer a unique opportunity to examine long-term trends in educational reproduction.
For *respondent's education*, we use the Casmin classification scheme of qualification levels, as first given by Koenig et al. (1988). In this scheme, the categories were defined to reflect the typical, class-specific barriers in the educational system and embrace the differentiations in courses and certificates that are relevant in the labor market (Mueller and Karle, 1993). In this paper, we combine some of the nine original educational levels in accordance with Mueller and Karle (1993) to form the seven levels that are shown in Table 1.

Table 1. Educational classification

Level of education	Casmin codes*	Codebook codes**	Years of schooling
0. Less than primary school	0,1a	0,1	6
1. Primary school finished	1b	2	8
2. Primary school and basic vocational qualif.	1c	3	10
3. Secondary school, intermediate qualification	2a,2b	4,5	12
4. Full school education, maturity level certificate	2c	6	14
5. Tertiary education, lower level	3a	7	16
6. Tertiary education, higher level	3b	8,9	18

* Casmin codes refer to codes used in Muller and Karle (1993).
** Codebook codes refer to Casmin codes as given in Appendix B of the codebook of the dataset analyzed.

We decided to create a variable that measures the respondent's final level of education attained, i.e. the *highest level completed.* To do so, we recoded our educational categories

to express the approximate number of years of schooling it took to complete that level (also shown in Table 1). Doing this, we made use of the information provided by the original investigators of the dataset. Furthermore, we wanted to apply Mare's method of examining the effects of parental background on respondent's final educational attainment. In order to do that, the difference in number of years of schooling had to be equal for the levels of education (Mare 1981, p. 78, fn 2).
As discussed above, people's final level of education can also be considered as a series of grades through which they move. At all successive *transitions*, a proportion of all respondents meet with success, whereas those remaining fail. Using our educational classification, the first transition can be considered as a failure for those who do not receive the socially recognized minimum level of education, i.e. primary school. Those who finish at least primary school are considered to be successesful. At the second transition, success means the continuation of education to a defined qualification level beyond primary school. Next, those who were successful at the second transition are differentiated at the third transition into persons who only attain a basic level of vocational training (failure) and persons who are admitted to secondary school (success). Subsequently, at the fourth transition, among those who reached secondary school, those who leave an educational institution with only a certificate of intermediate qualifications are considered as failures, while those who continue to full secondary school or to tertiary education are seen as successes. Furthermore, those who finish some form of tertiary education are considered as successes at the fifth transition, whereas those who leave school with only full secondary education are regarded as failures. Finally, at the sixth transition, among those who finish tertiary education, a distinction is made between those who finish a high degree (success) and those who finish a low degree (failure).

Parental background enters the analysis as *fathers highest level of education* (measured in years of schooling). This is the number of years it took for the respondent's father to complete his highest level. This highest level of schooling completed was recoded to express the approximate number of years of education using expert judgements and conversions suggested by the results for the respondents.

Models of educational stratification

Linear model of highest level completed

In research on social stratification, two types of models have been applied to model the relationship between social background and educational attainment. The first is the "Linear model of highest level completed." This model was introduced by Blau and Duncan (1967). It assumes that educational attainment, as the dependent variable, can be represented adequately by a metric variable (for example, years of schooling). Furthermore, it assumes that the relation between social background variables and successive levels of educational attainment is linear (see Blau and Duncan, 1967; Ganzeboom and Nieuwbeerta, 1996). In this model, the highest level of education (measured in number of years of schooling) for individual i in cohort c (Y_{ic}) is taken as the dependent variable, and social origin variables (X_{oic}) are taken as independent explanatory variables:

$$Y_{ic} = \beta_{0c} + \Sigma\beta_{oc}X_{oic} + \varepsilon_i \qquad (1)$$

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} - is equal to the value of the β_{oc} parameter in that cohort. Changes in the β_{oc} parameter across cohorts, therefore, represent changes in inequality of educational opportunity in a society (see Hauser and Featherman, 1976).

Logistic response model of school continuation

The second model is a "logistic response model of school continuation." This model was introduced by Mare (1980, 1981) and was applied in the volume edited by Shavit and Blossfeld (1993). It separates the educational career into a set of successive transitions between levels of education. At each transition, people having made all the preceding transitions, 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:

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

where p_{itc} is the probability of the *ith* individual in the *cth* 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. The λ_{otc} denotes the effect of a unit change in X_{oic} on the log odds of grade progression. Changes in the λ_{otc} 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, estimates of the parameters of this model do not vary with shifts in the marginal distributions of the variables in the model. In other words, the social origin effects on school continuation probabilities in a country are independent of shifts in the educational distribution in that country.

The two models combined

At first sight, these two models 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 proportion of people who are successful in making the distinguished educational transition (p_{tc}). He also showed 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:

$$\delta Y_{ic}/\delta X_{oic} = \beta_{oc} = \Sigma_{k=1}^{K} [\ \Sigma_{j=1}^{k} \lambda_{otc}\ p_{tc}\ (1 - p_{tc})\ \Pi_{l=1}^{k} p_{lc}\ ] \qquad (3)$$

where λ_{otc} represents the effect of background variable X_{oic} in the *cth* cohort on log odds of grade progression from level of schooling t-1 to level of schooling t. p_{tc} 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_{tc} and p_{lc} parameters) and the effects of the social background variables on school continuation probabilities in that cohort (i.e. the λ_{otc} parameters) (see Smith and Cheung, 1986).
The properties of equation (3) enable us to address one of our research questions. We were able to determine the consequences of (1) shifts in the distribution of education and (2) changes in the effects of parent's education on school continuation probabilities at different school transitions (3) on the effects of parent's education on final educational attainment in these countries. For that purpose, some counterfactual analyses were done. We calculated hypothetical values for the effects of parental background on final level of education attained (β_{oc}). First, these values were calculated under the assumption that the grade progression rates change over time (p_{tc}) but that the associations between background variables and grade progression are constant (λ_{ot}). This shows the pure consequences of educational expansion on educational inequality. Second, these values were computed under the assumption that the grade progression rates are constant (p_t) but that the associations between background variables and grade progression change across cohorts (λ_{otc}). These computations reveal the pure consequences of changing effects of parental background on school continuation probabilities in the distinguished schooling transitions.

Educational expanison

The aim of this paper is to examine trends in levels of intergenerational transmission of education in Eastern Europe. Before dealing with the central issue, we address our first question. That is, we describe the shifts in educational distributions in Eastern Europe over the period 1940-1975. In general, the conclusions we can draw on the patterns of educational expansion in these countries are in accordance with earlier descriptions (see e.g. Shavit and Blossfeld, 1993).

Table 2 presents the distributions of highest levels of education - measured in *years of schooling* - for men in the five countries; the figures are presented by cohort. In the beginning of the period, there were significant differences between the countries in the average number of years it took for people to finish their education. Around 1940, the mean level of education in the Czech Republic was the highest (about 11 years) and in Poland the lowest (about nine years). Furthermore, the data show that, also like in other industrial countries, the average educational attainment has expanded considerably since 1940 in the socialist countries. A rapid expansion took place between 1940 and 1965, and there was a slowdown in the 1970s and 1980s. By 1970, men in the socialist countries stayed in school about two years longer than in 1940. Educational expansion went somewhat slower for Czech men, who started at a much higher level in 1940.

Table 2. Educational attainment, highest level completed (years of schooling) by country and cohort

Cohort	Bulgaria	Czech Rep.	Hungary	Poland	Slovakia
Men					
1940	10.4	11.3	9.7	9.1	10.1
1945	10.3	11.5	9.9	10.2	11.5
1950	10.7	11.4	10.5	10.8	11.2
1955	10.8	11.4	11.4	10.9	11.4
1960	11.3	11.8	11.4	11.2	11.6
1965	11.6	11.5	11.5	11.4	11.9
1970	12.2	11.9	11.6	11.3	11.9
1975	12.8	12.1	11.1	11.4	12.0
All cohorts	11.3	11.6	11.0	11.0	11.6

Changes in the average number of years of schooling completed do not correspond to developments in the distribution of the various levels of education distinguished here. For that reason, Figure 1 traces the developments in the proportion of men having completed the distinguished *levels of schooling* as their highest level in the five countries. The figures show that around 1940, in all socialist countries (except the Czech Republic), about 45 to 70 percent of the men finished no more than primary school, about 25 percent finished some kind of secondary school, and about 15 percent finished some form of tertiary education. However, significant differences in the educational distributions existed between the countries. For example, in the Czech Republic, only about 20 percent of the men had completed no more than primary school, whereas in Poland and Bulgaria this percentage was almost about 70. The figures also show that educational expansion in all these countries is characterized by a decrease in the proportion of people having finished only primary education and a significant increase in the proportion having completed some kind of secondary education. On average, around 1975, the proportion of men finishing secondary education had risen to about 50 percent, whereas the proportion of men having finished only primary education had decreased to about a quarter. It is to be noted, however, that rising levels of education in the socialist countries did not imply that the share of men having finished some kind of tertiary education was growing. This proportion remained fairly stable at about 15 percent over the entire period.

Figure 1. Educational distributions and survival rates at school transitions in five East European nations.

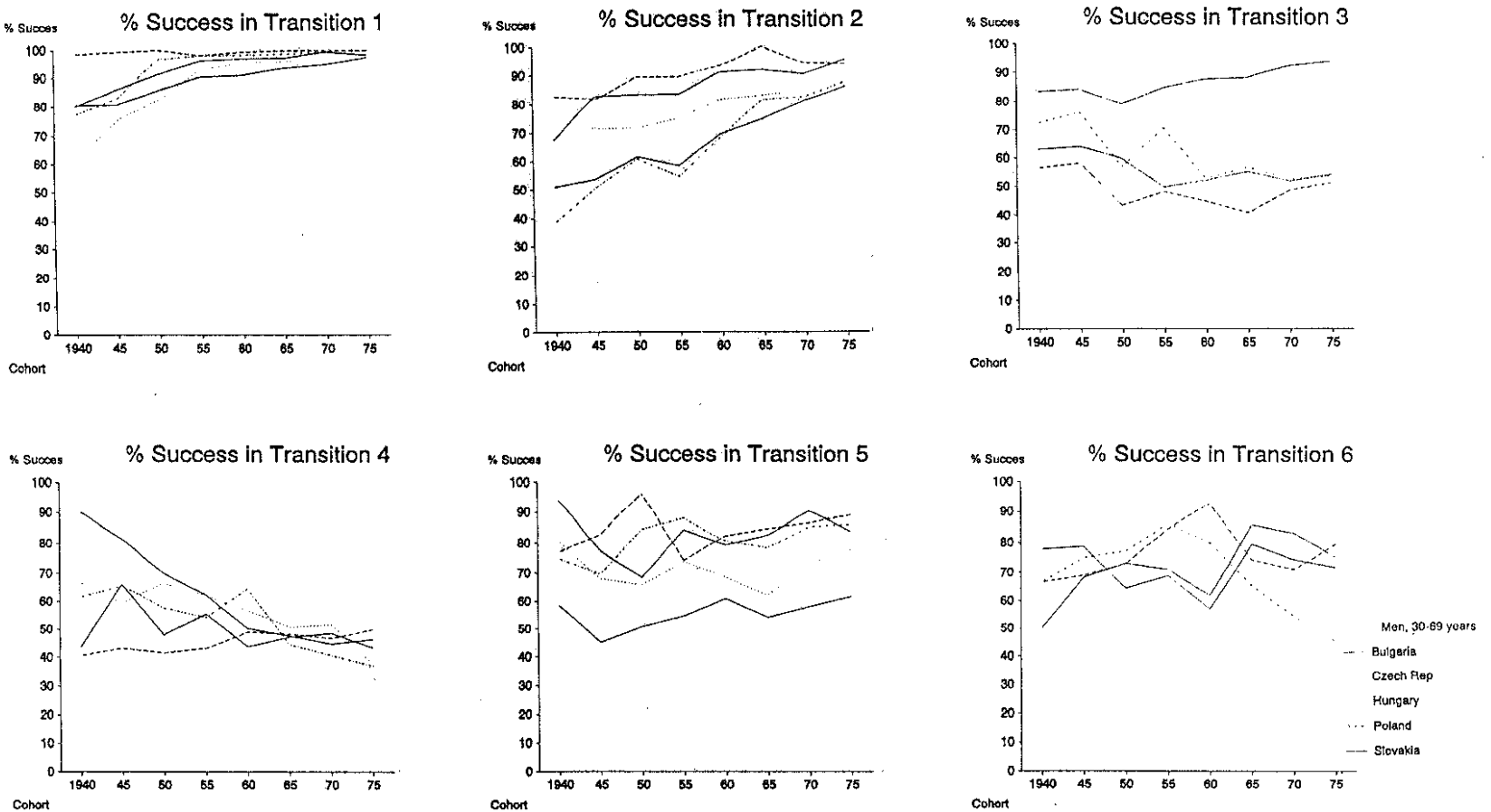
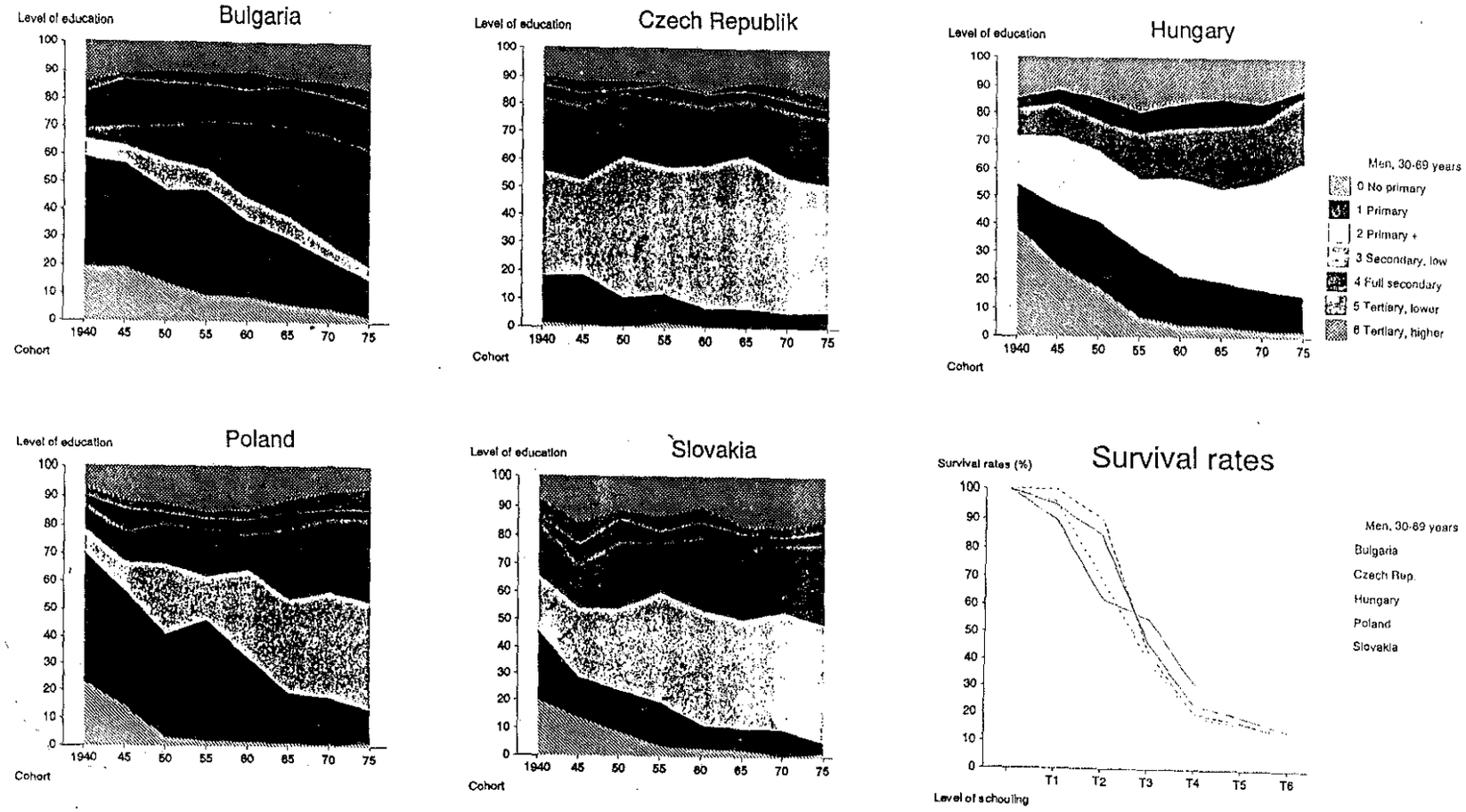


Figure 2. School continuation rates at school transition, by nation: men aged 30-69 in five East European nations.



The patterns of educational expansion have important consequences for the chance that men will be successful in continuing their educational career in the school transitions, i.e. the p_{tc} parameters in equation (3). For example, as shown in Figure 2, the higher percentage of people with secondary education implied a large increase in the proportion of men who were successful in the first two transitions. Around 1940, the chance that a man would finish at least primary education was about 80 percent, whereas around 1975 the chance was about 100 percent. Furthermore, in Bulgaria and Poland, the chances to complete some additional qualification rose from about 50 to 80 percent. For Hungarian men, these chances rose over the same period from about 70 to 80 percent, and for Czech and Slovakian men from 80 to 90 percent. At the third transition, people are differentiated into persons who only get a basic level of vocational training (failure) and persons who enter secondary education (success). The chance of success in this transition in the socialist countries (with the exception of Bulgaria) has declined somewhat over the period under investigation. At the other transitions, the school continuation probabilities remained fairly stable.

Effects of parental background on final educational attainment

The second question is whether the patterns of educational reproduction have changed over the period 1940-1975 in Eastern Europe. To begin with, we examined the changes in the effects of parental background on final educational attainment by employing the "linear model of highest level completed." In this model, the respondent's final educational attainment, measured in years of schooling, was regressed on the father's level of education, measured in the same way. In our analysis, the data for all nations were pooled.[1] We wanted to control in our models for the country-specific growth in average years of schooling. To do so, in addition to the model's intercept - representing the mean level of education (M) - dummy variables were included for the birth cohorts (C), for the nations (N), and for the nation-cohort combinations (NC). Slovakia and the cohort around 1960 were taken as reference categories. To test whether the effects of parental background varied between nations and cohorts, some variations of the "linear model of highest level completed" were applied. To select the model that represents the data best, the models' fit is compared with less that of general models. The F test was used to test whether the differences in fit are statistically significant. The goodness-of-fit statistics and model comparisons are reported in Table 3.

Table 3. Goodness-of-fit statistics (Sum of Squaresmodel) for selected linear regression models of highest level completed (years of schooling)

Terms in the model	df_{used}	SS_{model}	model a - model b	Δdf	F
1. M N C NC	39	14345.5			
2. M N C NC O	40	46063.7	2 - 1	1	2941.4*
3. M N C NC O ON	44	46202.1	3 - 2	4	3.9*
4. M N C NC O OC	47	46480.5	5 - 2	7	6.7*
5. M N C NC O ON OC	51	46646.2	5 - 3	7	7.1*
			5 - 4	4	4.7*
6. M N C NC O ON OC ONC	79	47036.3	6 - 5	28	1.6
7. M N C NC O OC_{lin}	41	46362.1	7 - 2	1	34.2*
			7 - 4	6	2.2*
8. M N C NC O ON OC_{lin}	45	46531.4	8 - 3	1	37.1*
			8 - 5	6	2.2*
			8 - 7	4	4.8*
9. M N C NC O ON OC_{lin} ONC_{lin}	49	46693.6	9 - 6	30	1.3
			9 - 8	4	4.6*

Note: M=Grand mean; N=Nation; C=Cohort (categorical); C_{lin}=Cohort (linear); O=Origin (father's education years of schooling); No. of cases: 7,969; SS_{total}=194,933; * significant at 0.05 level; $F(df_a\text{-}df_b, N\text{-}df_b) = [(SS_a - SS_b)/(df_a\text{-}df_b)] / [(SS_{total} - SS_b)/(N - df_b)]$

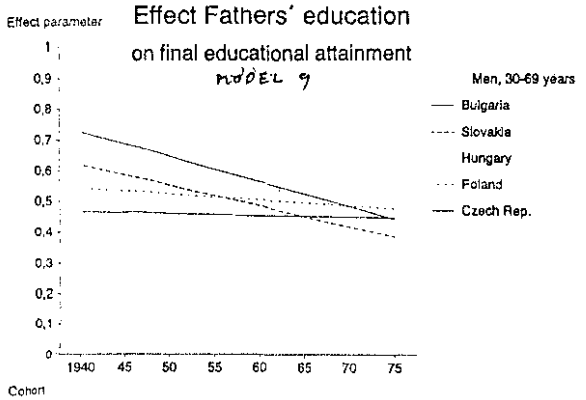
Model 1 does not include a term for social origin (father's education) and serves as baseline model. Model 2 does include a term for social origin (O) and results in a much better fit than the first model. Thus, father's education has a substantial impact on final educational attainment. Next, we examined whether the effects of social origin varied between nations and cohorts. Therefore, in successive models, we added interaction terms between the social origin, nation and cohort variables (ON, OC, and ONC). Comparison of these models' fit suggests that the data can best be described by Model 9. This model allows the effects of social origin on final educational attainment to differ across the countries and to change over the cohorts in a linear way. Furthermore, it allows the speed of these linear trends to differ among the countries.

Table 4. Selected parameters of "Linear model of highest level completed", number 9

	Effect of origin (father's education) (in 1960)		Linear trend in effect of origin (father education) (Change / 5 years)	
Country	Parameter	s.e.	Parameter	s.e
Bulgaria	0.564*	0.017	-0.041*	0.008
Czech Rep.	0.455*	0.019	0.003	0.009
Hungary	0.487*	0.016	-0.031*	0.008
Poland	0.504*	0.022	-0.010	0.010
Slovakia	0.484*	0.020	-0.034*	0.009

Note: * significant at 0.05 level.

Figure 3. Estimated effects of origin (father's education: years of schooling) on highest level of education completed (years of schooling) by cohort (Source: Table 4).



The parameter estimates of Model 9 are presented in Table 4 and Figure 3. They give a more precise picture of the effects of father's education on final educational attainment in Eastern Europe in the period 1940-1975. Due to our coding procedure, the parameters for the effects of father's education represent these effects for the cohort around 1960. The coefficients for the various countries vary between 0.455 in the Czech Republic and 0.564 for Bulgaria. From an 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. Specifically, they suggest that communist regimes have not been able to diminish the intergenerational transmission of status in education. However, in some of the countries, the effects of father's education have decreased over the period 1940-1975. The linear trend parameters, representing the change in the effects of father's education per five years, differ (statistically significant) from zero in Bulgaria, Hungary and Slovakia. The values of the trend parameters in these countries imply that for men in the first cohort (who entered the educational system around 1940), the social origin effects were about 25 percent greater than for men in the last cohort (who entered around 1975). Thus, in these countries, the advantages for children of more highly educated fathers have gradually diminished over that period. However, in Poland the decrease in the effect of social origin was rather small and statistically insignificant. In the Czech Republic, there was even a small (though insignificant) increase.

Effects of parental background on school continuation probabilities

Our third question concerns the impact of fathers education on the respondent's school continuation probabilities in each transition. We focus on how this effect has changed in Eastern Europe over the period 1940-1975. To answer this question, we used the "logistic response model of school continuation." The log-odds to be successful versus not to be successful at a certain transition were assumed to depend on social background variables (here: father's education). A dataset was analyzed containing pooled information from all

six transitions. For each transition, a datafile was created containing those respondents being at risk - i.e., those who survived all previous transitions - and these datafiles were merged. In order to control for varying success rates across transitions (T), nations (N) and cohorts (C), the models included dummy variables for these variables and their interaction terms (TN, TC, NC, and TNC). As reference categories, we took Slovakia, the first transition, and the cohort around 1960. To test whether the effects of parental background differed significantly across transitions, nations and cohorts, several variations of the "logistic response model of school continuation" were applied. Likelihood ratio tests (L^2) and Baysian Information Coefficients (BIC) (for more information see Treiman and Yamaguchi, 1993, p. 240) are used to detect whether the fits of the models differed significantly. The goodness-of-fit statistics and results from the model comparisons are presented in Table 5.

Table 5. Goodness-of-fit statistics for logistic response models of school continuation

	Fit statistics		Model comparisons			
Model and Independent variables	df	L^2	Contrast	Δdf	ΔL^2	ΔBIC
0. Z (= M T N C TN TC NC TNC)	239	25195.3				
1. Z O	240	23948.1	1 - 0	1	1247.2*	1237
2. Z O OT	245	23762.1	2 - 1	5	168.0*	117
3. Z O ON	244	23944.2	3 - 1	4	3.9	-37
4. Z O OC	241	23945.7	4 - 1	1	2.4	-8
5. Z O OT ON	249	23751.4	5 - 2	4	10.7*	-30
			5 - 3	5	192.8*	142
6. Z O ON OC	245	23941.9	6 - 3	5	2.4	-49
			6 - 4	4	3.8	-37
7. Z O OT OC	246	23751.2	7 - 2	1	10.9*	
			7 - 4	5	194.5*	141
8. Z O OT OC ON	250	23741.6	8 - 5	1	9.8*	-
			8 - 6	5	200.3*	141
			8 - 7	4	9.6*	-3
9. Z O OT ON ONT	269	23717.2	9 - 5	20	34.2*	-17
10. Z O ON OC ONC	249	23938.4	10 - 6	4	3.5	-3
11. Z O OT OC OCT	251	23744.5	11 - 7	5	6.7	-4
12. Z O OT ON OC ONT	270	23706.9	12 - 7	24	44.3*	-20
			12 - 8	20	34.7*	-17
13. Z O OT ON OC ONC	254	23739.3	13 - 8	4	2.3	-3
14. Z O OT ON OC OCT	255	23735.3	14 - 8	5	6.3	-4
15. Z O OT ON OC ONT ONC	274	23704.1	15 - 12	4	2.8	-3
			15 - 13	20	35.2*	-17
16. Z O OT ON OC ONT OCT	275	23700.2	16 - 12	5	6.7	-4
			16 - 14	20	35.1*	-17
17. Z O OT ON OC ONC OCT	259	23732.6	17 - 13	5	6.7	-4
			17 - 14	4	2.7	-3
18. Z O OT ON OC ONT ONC OCT	279	23697.0	18 - 15	5	7.1	-4
			18 - 16	4	3.2	-3
			18 - 17	20	35.6*	-16
19. Z O OT ON OC ONT ONC OCT ONTC	299	23681.2	19 - 18	20	15.8	-18

Note: M=Grand mean; T=Educational transition; N=Nation; C=Cohort (linear); O=Origin (father's education: years of schooling). N = 7,969; BIC= L^2 - df*ln(N).

Model 0 includes all control variables but assumes no effects of parental background; it thus serves as a baseline. Model 1 assumes an effect of social origin (O) on the continuation probabilities in the various transitions. Not surprisingly given the earlier analysis, it represents the data significantly better. Model 2 allows the effects of father's education to differ across the distinguished school transitions (OT). According to the likelihood ratio test and the BIC, this model gives a much better fit than Model 1. We may therefore draw the tentative conclusion that father's education had a significant effect on school continuation probabilities and that the strength of that effect differed across the transitions.

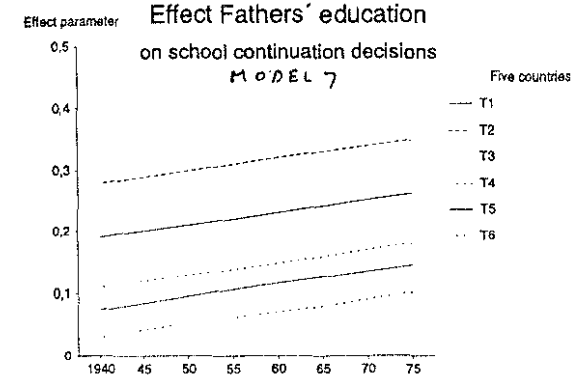
Subsequently, we applied several models to test whether the social origin effects also differed between countries and cohorts (Model 3 to Model 19). The results of the comparison of these models' fit statistics, using both the likelihood ratio test and the BIC, show that Model 7 represents the data best.[2] This one, like Model 2, allows the effect of father's education on school continuation probabilities to differ between transitions. In addition, it assumes that this effect changed linearly over the cohorts at the same speed in all countries and for all transitions.

Table 6. Selected parameters of "Logistic response model of school continuation", number 7 (Z O OT OC).

Meaning of parameter	Parameter	s.e.
O:		
Father's education (in Transition 1, Slovakia)	0.230*	0.010
OT:		
Father's education * Transition 2	0.089*	0.018
Father's education * Transition 3	0.024	0.014
Father's education * Transition 4	-0.081*	0.014
Father's education * Transition 5	-0.115*	0.017
Father's education * Transition 6	-0.160*	0.019
OC_{lin}:		
Father's education * Linear trend	0.010*	0.003

Note: * significant at 0.05 level.

Figure 4. Estimated effects of origin (father's education: years of schooling) on school continuation log-odds, from logistic response model of school continuation 7 (Table 8 and 9): men aged 30-69 in five East European countries.



A selection of the parameter estimates of Model 7 are presented in Table 6 and Figure 4. The first parameter (O) represents the effect of father's education on the log-odds to be successful at the first transition. Other parameters (OT) represent the differences between the effects in other transitions and the effect in the first. The sums of these O and OT parameters give the effects of father's education in the distinguished transitions and are positive for all transitions. Thus, the higher father's education at each transition is, the higher the success rates will be. Besides, the parameter estimates show that the effects of father's education decreased over the schooling transitions. At the first transition, a change of one unit (i.e. year) in father's education yields a change of 0.230 in the log-odds to be successful versus not to be successful. At the last transition, such a change results in a change of only 0.230 - 0.160 = 0.070 in the comparable log-odds. This finding is more or less in line with results from studies in other industrialized countries (Mare, 1980; Shavit and Blossfeld, 1993). However, we find that the effects of parental background on the second and third transition are somewhat greater than the effect at the first transition. This might be due to the fact that we distinguished between the levels "less than primary school" and "primary school finished." Earlier studies did not make this distinction.

The estimated linear trend parameter of Model 7 indicates the extent to which the effects of father's education on the respondent's continuation probabilities have changed over the period 1940-1975. This change is assumed to be identical at all schooling transitions (as well as for all countries). The positive and significant value of the trend parameter (0.010, s.e. 0.003) implies that the effects of father's education increase by 0.010 each five-year period. Consequently, the effect of father's education on the log-odds of being successful versus not successful at the first transition has increased from (0.230 - 4 * 0.010 =) 0.190 around 1940 to (0.230 + 3 * 0.010 =) 0.260 around 1975, and from 0.030 to 0.100 for the sixth transition over the same period. We do not want to emphasize the significant increase found in the effects of parental background. Nevertheless, we should note that more than 40 years of state socialism in Eastern Europe has not reduced educational reproduction. Our findings are in line with the results of most earlier studies on social stratification in communist countries (Peschar, 1990; Shavit and Blossfeld, 1993; Gerber and Hout, 1996).

Explaining variation in effects of parental background on final educational attainment

At first sight, the results described in the preceding two sections seem contradictory. On the one hand, the effect of father's education on final level of education attained (measured in years of schooling) has decreased in at least three of the five East European countries under investigation over the period 1940-1975. On the other hand, the effects of father's education on the school continuation probabilities at school transitions have increased over that period. However, as Mare (1981) already pointed out, these seemingly contradictory findings might reflect another important development in these countries: the substantial expansion of education.

Therefore, we now turn to the fourth and last question posed in this paper. That is: what were the consequences of (1) shifts in the distribution of education and (2) changes in the effects of parent's education on school continuation probabilities at different school transitions on (3) the effects of parent's education on final educational attainment in these nations? To answer this question, we use the method developed by Mare (1981). This entails calculating hypothetical values for the effects of father's education on final educational attainment (measured in years of schooling) in three counterfactual situations using equation (3), as shown earlier in this paper. The calculated values are presented in Table 7.

In the first counterfactual situation (A), it is assumed that the grade progression rates changed over time (p_{tc}), i.e. had the values reported in Figure 2. It is also assumed that the association between father's education and grade progression was constant (λ_{ot}), i.e. had the values of the effect parameters (O and OT) of Model 7 in Table 6. This shows the "pure" consequences of educational expansion on educational inequality in Eastern Europe over the period under investigation. The figures obtained show that under these conditions, the effects of father's education would have decreased significantly. For example, in Bulgaria, the effect would have had the value 0.764 in the first cohort (around 1940) and 0.451 in the last cohort (around 1975). Similar patterns are found for the other nations, although the decrease is less pronounced in the Czech Republic. The decline in the effects is also illustrated by estimated trend parameters, as given in Table 7. To obtain these trend parameters, for each country, a linear regression was performed on the presented counterfactual effect parameters, taking the year of cohort as an independent variable. For all countries except the Czech Republic, these trend parameters have a significant and rather large negative value. Thus, if no other mechanisms had been at work, educational expansion would have caused the effects of father's education on final educational attainment to decrease substantially over the period 1940-1975.

Table 7. Results of counterfactual analysis: (A) Effects of origin (father's education: years of schooling) on final educational attainment (years of schooling) under the condition of stable associations between origin and school continuation probabilities, but varying educational distributions, (B) these effects under the condition 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	Bulgaria	Czech Rep.	Hungary	Poland	Slovakia
A: p varies over countries and cohorts, λ constant (model 2)					
1940	0.764	0.486	0.741	0.600	0.643
1945	0.720	0.518	0.666	0.700	0.686
1950	0.698	0.433	0.702	0.641	0.571
1955	0.676	0.454	0.679	0.666	0.558
1960	0.626	0.444	0.585	0.637	0.458
1965	0.584	0.412	0.555	0.517	0.493
1970	0.517	0.426	0.543	0.476	0.493
1975	0.451	0.459	0.433	0.437	0.428
Trend parameter	-0.043*(0.003)	-0.009*(0.004)	-0.039*(0.006)	-0.032*(0.009)	-0.033*(0.006)
B: p constant, λ varies over countries and cohorts (model 12)					
1940	0.520	0.364	0.486	0.536	0.375
1945	0.546	0.384	0.511	0.561	0.396
1950	0.573	0.404	0.535	0.587	0.417
1955	0.599	0.424	0.560	0.612	0.437
1960	0.626	0.444	0.585	0.637	0.458
1965	0.652	0.464	0.610	0.663	0.478
1970	0.678	0.483	0.635	0.688	0.499
1975	0.705	0.503	0.660	0.713	0.520
Trend parameter	0.026 (-)	0.020 (-)	0.025 (-)	0.025 (-)	0.021 (-)
C: both p and λ vary over countries and cohorts					
1940	0.645	0.403	0.617	0.507	0.538
1945	0.634	0.452	0.583	0.617	0.597
1950	0.641	0.395	0.644	0.590	0.521
1955	0.649	0.434	0.651	0.640	0.534
1960	0.626	0.444	0.585	0.637	0.458
1965	0.609	0.430	0.579	0.539	0.516
1970	0.564	0.466	0.590	0.517	0.536
1975	0.516	0.522	0.488	0.495	0.489
Trend parameter	-0.016*(0.004)	-0.012(0.004)	-0.013(0.006)	-0.009(0.009)	-0.009(0.006)

Note: * significant at 0.05 level

In the second counterfactual situation (B) it is assumed that the grade progression rates were constant over time (p_t). Accordingly, we assigned them the values for 1960 in each country. In contrast, the association between background variables and grade progression varied over time, corresponding to the linear trend parameter of Model 7 in Table 6 (λ_{otc}).

The values obtained for the effect parameters under these conditions indicate that in all countries, the effects of father's education would have increased by about 0.020 over each five-year period. Thus, the changes in the effects of parental background on school continuation probabilities at various transitions (i.e. under the condition of constant educational distributions) would have resulted in substantial increases in the effects of father's education on final educational attainment.

In the third counterfactual situation (C), we examine the consequences of simultaneously changing educational distributions and effects of parental background on school continuation probabilities. The grade progression rates were assumed to have changed (p_{tnc}) according to the values presented in Figure 2. The association between background variables and grade progression were assumed to change according to the trend parameter of Model 7 in Table 6 (λ_{otc}). The values obtained for the effects of father's education on final educational attainment show that in this counterfactual situation - which is almost identical to the empirical situation - these effects would have decreased in all countries but the Czech Republic. The speed of the decrease would have been less pronounced than in counterfactual situation A, however.
Concluding, the relatively small factual decreases in the effects of father's education on final education attainment (measured in years of schooling) in Eastern Europe over the period 1945-1975 are the result of two offsetting influences. The increases in the effects of parental background on school continuation probabilities at schooling transitions caused these effects to rise, whereas the substantial educational expansion in these countries caused these effects to decrease substantially. This observation strongly resembles Mare's findings for the USA over the period 1907-1951 (Mare, 1981).

Conclusions

Research on how parental background affects 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. This paper, following Mare (1981), combines these two approaches. First, analyzing 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 countries over the period 1940-1975. Second, this paper shows that the pattern of changes in these effects can be explained by two offsetting influences: increases in the effects of parental background on school continuation probabilities at schooling transitions have caused these effects to rise, whereas substantial educational expansion in these countries has caused these effects to decrease significantly.
There has been some debate on whether the final educational attainment or the progression rates should be under investigation when focusing on processes of social stratification at the national level. In this paper, we do not take sides; we feel that both tell their own story. It is interesting to know how large the effects of parental background are at each successive transition of a person's educational career. However, people's highest level of education completed will usually be the decisive factor for success in their occupational career. Therefore, the effects of parental background on their final educational attainment are also highly relevant. Furthermore, if the effects of parental background decrease due

to educational expansion in a society, this might have important consequences for the association between social origin and occupational status in that society.
Then there is the question of how succesful the communist regimes have been in reducing the effects of people's parental background and in creating more egalitarian and meritocratic societies. The implications of our findings are not univocal. On the one hand, we have shown that the effects of parental background on school continuation probabilities have certainly not decreased - they have even increased - between 1940 and 1975. This suggests a complete failure of the destratification policy. However, we have also shown that the marked expansion of education in Eastern Europe has resulted in substantial downward pressure on the effects of parental education on final educational attainment. Since educational expansion in these countries can be seen as a direct result of communist educational policy, there are grounds to argue that, in this respect, the communist regimes were successful in reducing inequalities in education. Nevertheless, this success was more an unintended consequence of the general educational policy than an intended consequence of a specific destratification policy.

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Notes

1. All analyses in this paper were also done using separate datasets for each country. However, since these analyses yielded similar results, is was decided not to present these in the text.

2. According to the likelihood ratio test, Model 12 provides a better fit compared to Model 7. However, the improvement in fit due to adding the interaction terms (ON) and (ONT) is rather small and only on the edge of statistical significance. Furthermore, the BIC comparison indicates that we should decide in favor of Model 7.

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