

The Perceived Value of Education and Educational Aspirations in the Czech Republic: Changes in the determination of educational aspirations between 1989 and 2003¹

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Abstract

This paper analyzes changes in the determination of educational aspirations from 1989 to 2003 in the Czech Republic, a country where the intergenerational transfer of beliefs about life-success between parents and children has taken place in the context of significant social, political and economic transformation. In doing so, the paper contributes to an explanation of how rapid socio-economic change may influence both aggregate levels of educational aspirations among pupils as well as how those aspirations are determined by social origin and other factors. The Czech case is also particularly important for research on aspirations as previous studies have shown that the Czech educational system generates a significantly stronger determination of educational aspirations by social origin, ability and gender than is the case in most other OECD countries.

The empirical research is based on a comparison of data from the “Family ‘89” (*Rodina ’89*) survey conducted in January 1989 (roughly ten months before the collapse of communism) and the 2003 PISA-L survey for the Czech Republic. In comparing the two time periods, the paper hypothesizes that the social origin of the background family had a stronger *direct* impact on the educational aspirations of adolescents in 1989, while in 2003 social origin had a much stronger *indirect* influence. The stronger direct impact in 1989 is due to the very limited access of higher education under socialism and the role higher education played in the reproduction of the cultural elite. But with the gradual expansion of, and the rapidly increasing returns to, higher education during the transition period, social origin began to have a largely indirect effect on aspirations, particularly through the value pupils began to place on higher education as a means of life-success. The empirical results of the analysis confirm our main hypothesis about the change from direct to indirect effects, and highlight the importance of the study of educational aspirations from a historical point of view.

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Introduction

This paper compares the changes in the determination of educational aspirations from the end of the communist period to 2003, focusing on a single post-communist country, the Czech Republic. The Czech case is particularly relevant for international research on educational aspirations in that previous studies have shown that the Czech educational system generates a significantly stronger determination of educational aspirations by social origin, ability and gender than is the case in other OECD countries. On the basis of those findings, this paper examines whether and how these strong determining forces have changed over time. The analysis is made possible by the fact that in 1989, just a few months before the collapse of the Czechoslovak communist regime, a survey was carried out on 8th grade elementary school pupils (around 15 years of age) and their parents, focusing primarily on the process of the formation of beliefs about life-success and educational aspirations. By using that survey alongside similar data from PISA 2003, we can historically compare the role of the intergenerational transfer of values about life success, mental ability and socio-economic status in the formation of educational aspirations in adolescents in 1989 and 2003.

As background, this paper first overviews key features of the educational system during the communist and transition periods that shaped aspirations during those times, particularly with regard to the labor market returns of higher education. Next, we briefly overview prior research on educational aspirations in the Czech Republic. We then develop hypotheses about the change in the relationships between socio-economic background, measured ability, beliefs about the role of education in life-success and educational aspirations from 1989 to 2003. The core of the paper is dedicated to presenting the key findings about the role of social background, ability, perceived role of education in life-success among parents and their children in the formation of educational aspirations of 15-year-old boys and girls. We then conclude by summarizing what changes in the determination of educational aspirations of adolescents have occurred during the 15 years of transition.

Continuity and change in the educational system before and after 1989

Post-communist societies provide an excellent opportunity for examining the changes in the determination of educational aspirations under different regime and economic contexts. As has been well-established, after 1948 the triumphant Czechoslovak communist party embarked on an ambitious policy of eliminating lower class disadvantage in educational access by implementing quotas for pupils from working class backgrounds. This process of ‘de-stratification’² proved to be *initially* successful, as both quotas and educational expansion reduced the effect of parents’ occupational status on the success of their pupils to transition to vocational and secondary technical schools in the early communist period. However, as originally expressed by the socialist transformation hypothesis (Matějů 1990, 1991, 1993), by the mid-1970s educational inequalities in secondary education returned to their pre-communist levels, in part because the communist

² We have carried out a re-analysis of Šafář’s replica of Duncan’s basic model of social stratification to verify the justification of the “*de-stratification*” thesis and its implications for the basic relationships in the stratification system; contrary to initial assumptions, the analysis has shown that the classical stratification model could not be applied without substantial modifications to the stratification system of socialist Czechoslovakia (Boguszak, Gabal and Matějů, 1990).

bureaucratic elite was able to use their political connections and positions of authority to ensure their children's access to prestigious secondary schools and universities.

During the communist period, income leveling eliminated large economic returns to tertiary education. Children from the traditionally lower class families had little incentive to pursue higher education, since the lack of financial or political advantages meant that it was not an effective strategy for life success (Simonová 2007). On the other hand, children of the bureaucratic elite and those with well-educated parents continued to pursue higher education as a means of maintaining and transmitting the cultural status of their parents. The elimination of economic returns to tertiary education may help explain the significant increase in girls' enrollment at the tertiary level, as the more 'masculine' and prestigious occupations coveted by male pupils would require that they pursue a technical education at the secondary level, leaving more university seats available to females. Lastly, the role of higher education in the cultural reproduction of the elite was possible precisely because such families had the cultural knowledge to succeed in the transition to tertiary education, particularly in the 1980s when the increased number of secondary school graduates led to a decline in the chances of making a successful transition to a university. In such a context, we would expect that social origin would play a strong and *direct* role in determining the educational aspirations of pupils.

After the abrupt collapse of the Czechoslovak communist regime, the process of economic transition and the emergence of competitive labor markets inevitably led to increased economic returns to higher education, which in turn contributed to the steeply rising aspirations for higher education. Večerník (2001, 2005) calculated that the effect of education on personal income more than doubled between 1988 and 2002. While in 1988 each year of education brought a 'premium' of a 4% salary increase, this reached 8% in 1996 and 9.6% in 2002 (controlling for gender and the length of employment). This income differentiation was achieved despite income stagnation in state-controlled branches with a high proportion of university-educated employees: health care, education, science and research etc.³ If we disregard those occupations, the wage returns of one year of education increased from 4% in 1989 to 11% in 1996, which places the Czech Republic at the same level as Austria and other West European countries. This is also confirmed by OECD data. By the turn of the century, the average earnings of a person with tertiary education in the Czech Republic was 1.8 times higher than the earnings of a secondary education graduate, even above the OECD average of 1.63 (OECD 2002).

Given the increase in aspirations for, and economic returns to, higher education, one would expect that the tertiary education system would also undergo a 'transition' of rapid educational expansion and structural reform. In fact, however, the *system* of tertiary education changed little from 1989 to 2003, the years that interest us. First, while there has been a significant increase in tertiary education enrollment since 1990, this has only kept pace with the increased number of high school graduates, such that the proportion of graduates enrolled in tertiary education, as well as admissions rates, changed little from 1989 to a decade after.⁴ Second, while the 1990 *Act on Higher Education* removed political control over universities (Matějů and Simonová 2003), it

³ In real terms (using 2000 as the reference point), the average pre-tax monthly wage of an academic instructor at a public college or university was 18,310 CZK in 1989, in comparison to 21,147 CZK in 2002 (Institute for Information on Education, accessed on July 2007 from website at <http://www.uiv.cz/soubor/893>). This lack of income growth has prevented academic occupations from attaining higher prestige.

⁴ The acceptance rate (the number of accepted divided by the number of applicants) for all tertiary education institutions was 52.4% in the 1999/2000 school year, nearly constant with the 49.9% registered in 1988/1989.

maintained their unitary structure. While in many OECD countries bachelor programs were designed to provide practical skills to a growing number of university applicants, the number of students enrolled in these types of programs in the Czech Republic grew very slowly until 2001, when an legislative amendment obliged universities to speed up the Bologna process.⁵

Lastly, the structure of public financing of higher education also changed little from 1989 to 2003. While the revised 1998 *Act on Higher Education* provided more formal autonomy to universities, it barred universities from engaging in joint ventures with private companies or from creating spin-off companies. Public tertiary education also remains tuition free. The Czech Republic's average per student expenditure for tertiary education in 2002 amounted to USD/PPP 5,922, compared to the OECD average of USD/PPP 10,080 (OECD 2005). Due to the supply constraints caused by low overall financing, participation in tertiary education among the relevant age cohorts is among the lowest in the OECD, with only 26% of Czechs aged between 20-24 in higher education. To the credit of the 1998 *Act*, it did however open space for establishing 'non-university' institutions of higher education (providing lower level tertiary education at the bachelor level) and for private colleges – though those institutions continue to face the problems of outside financing, often lower prestige and the difficulty of competing with state-subsidized universities.

Research on educational aspirations in the Czech Republic

Beginning in the 1950s, educational aspirations of adolescents were viewed as one of the strongest predictors of educational and occupational careers (Hyman 1953; Reissman 1953; Kahl 1953; Herriott 1963). Over time, research on aspirations focused on its role in mediating the effects of socio-economic background on educational and occupational attainment. In the many pioneering studies of Sewell and his colleagues, educational aspirations of adolescents were largely explained in terms of parental SES, measured ability, academic performance, parents' expectations and encouragement, and peers' aspirations, to list just a few (see e.g. Sewell, Haller, and Straus 1957; Sewell 1961, 1963; Sewell and Hauser 1972, Sewell and Shah 1967, 1968a,b). In the 1970s, Kerckhoff argued that proponents of the social psychological model did not pay adequate attention to the structural constraints that individuals take into account when making important decisions about their future educational and occupational careers (Kerckhoff 1976, 1977). As a result of these debates, more recent international research has focused on the interplay between the individual, contextual and structural levels in the formation of educational aspirations in different countries (e.g. Buchmann and Dalton 2002).

The most recent analysis of the formation of Czech educational aspirations took the form of a comparative analysis with other OECD countries (Matějů, Soukup, Basl and Smith 2006). That analysis corroborated the hypothesis that the Czech educational system, due to its high degree of stratification and vocational specificity (Kerckhoff 2001; Müller and Shavit 1998)⁶ generates a

⁵ The Bologna Process, launched by the Bologna Declaration of June 1999, aims to create a European Higher Education Area by 2010. The three priorities of the Bologna process are: Introduction of the three cycle system (bachelor/master/doctorate), quality assurance, and recognition of qualifications and periods of study. For an overview, see http://ec.europa.eu/education/policies/educ/bologna/bologna_en.html

⁶ Stratification "refers to the degree to which systems have clearly differentiated kinds of school whose curricula are defined as 'higher' and 'lower'. (...) In stratified systems, the program offerings in the types of secondary schools are associated with different degrees of access to opportunities for additional, more advanced schooling." (Kerckhoff 2001:4). Vocational specificity refers to the degree to which curricula are designed to prepare students

significantly stronger determination of educational aspirations by social origin, ability and gender than is the case in OECD countries with less stratified (differentiated) systems of secondary education. The analysis was based on the initial categorization of OECD countries in terms of the relationship between the determination of educational aspirations and a composite variable indicating openness and permeability of a country's educational system.⁷

Several findings of the analysis can be highlighted. First, the overall degree to which educational aspirations are determined by ability, gender and parental SES was found to be much higher in the Czech Republic, Germany, Hungary, Poland and other countries with highly stratified systems (where the Nagelkerke R^2 was more than .40) whereas the coefficient of determination was much less in the US, Canada, Australia, France and other countries with less stratified and more open educational systems (where the Nagelkerke R^2 was less than .25). Second, the effect of the school attended on educational aspirations is much stronger in countries representing Type 1 (the Czech Republic, Germany), than in countries belonging to Type 2 (France, Great Britain) and especially to Type 3 (United States, Sweden).

Perhaps most importantly, the study also found that, after taking into account relevant variables, the net effect of students' ability on aspirations is quite homogeneous across countries. This finding challenges previous claims about the 'realism' of aspirations (Buchmann and Park 2005). That is, the study found that pupils with a given level of ability in highly stratified educational systems assess their prospects to the same degree as pupils with the same level of ability in less stratified systems. However, this is not the case for the net effect of social origin on aspirations, which – unlike the net effect of ability – is significantly stronger in more stratified educational systems. In countries like the Czech Republic, this finding testifies to the presence of “adopted discrimination” generated by mechanisms described previously as “sponsored mobility” (Turner 1960) rather than about “more rationality.”

While comparative analyses of the determination of aspirations have already borne interesting results, it has been more difficult for scholarship to examine how the determination of aspirations has changed through periods of social transformation. In post-communist countries, the intergenerational transfer of beliefs about life-success between parents and children has taken place in the context of significant social, political and economic change. Arguably, these changes may have had an important impact on the formation and intergenerational transfer of beliefs about life-success. Temporal comparisons within a given transition country are also useful for observing both differences in the total effect of social origin on educational aspirations, as well as the indirect effects of social origin, such as through the role of intervening variables that may be more prominent in one historical context but not another. Therefore, this study seeks to advance our understanding of the historical development of the determination of aspirations by juxtaposing 2003 PISA data with data from a 1989 survey on 8th grade elementary school pupils (around 15 years of age) and their parents, focusing in particular on the role of the intergenerational transfer of values about life success, mental ability and socio-economic status in the formation of educational aspirations in adolescents between those time periods.

for particular vocations. In terms of statistical indicators, it can be represented by the proportion of students leaving the educational system with specific skills (e.g. Buchmann and Dalton 2002).

⁷ This led to the categorization of Type 1, Type 2 and Type 3 countries, in which Type 1 countries (e.g. Germany and the Czech Republic) are the most stratified and exhibit the greatest determination of aspirations, Type 3 countries (e.g. Sweden and the USA) have the least stratified systems and exhibit the smallest determination of aspirations, whereas Type 2 countries (France and Great Britain) are situated in the middle with respect to both factors.

As will be demonstrated further this is by no means a comparative historical analysis *stricto sensu*. The problem is that the surveys which served as the basis for this paper did not use quite the same tools and therefore the measurement protocols for the important variables are not identical. That makes a *direct* comparison difficult. We hold, however, that the causal structures of the relations determining the life plans of 15 year-olds in 1989 and 2003 are an interesting subject for analysis even without the possibility of a direct comparison.

Main hypotheses

As for the changes that took place between 1989 and 2003, we build on the assumption that under socialism higher education was in demand, but in view of its relatively low economic return, mostly families with the highest education and economic status adopted higher education as a strategy of life-success. In general, we can say that, during socialism, higher education played an important role in the reproduction of the cultural elite. Due to the significant change in the economic returns of education in the transition period, education has been increasingly seen as a more universal “strategy” for life-success than was the case under socialism. We also hypothesize that the change in economic returns to education and in the role of education in life-success after 1989 caused a significant growth in educational aspirations between 1989 and 2003.

Consequently, educational aspirations have been steeply growing during the post-communist transformation. However, as shown in our previous analyses, the system of secondary education in the Czech Republic has remained highly stratified and selective, and the same holds for the system of tertiary education. Therefore, competition for admissions to tertiary education has been extremely strong. In order to increase their chances of being admitted to a college or university, parents strive to place their children in elite secondary schools (*gymnasia*).

Having empirical evidence about these processes, we hypothesize that social origin plays a very strong determining role. But in comparing the two time periods, we hypothesize that the social origin of the background family had a stronger *direct* impact on the educational aspirations of adolescents in 1989, while in 2003 social origin is expected to have a much stronger *indirect* influence. For building explanatory causal models to be tested on the data from the two surveys, this general hypothesis (represented in Diagram 1) has been decomposed into four simple ones:

- a. The direct effect social origin on aspirations (coefficient g_{41}) has diminished between 1989 and 2003;
- b. The effect of ability on aspirations (coefficient b_{41}) has grown during this period;
- c. The effects of parental SES on the perceived value of education among parents and children (coefficients g_{21} and g_{31}) have weakened;
- d. As a result, the total effect of social origin on educational aspirations has not changed, i.e. has remained strong.

<Diagram 1 about here>

Data and methodology

The 1989 data comes from a survey titled “Family ‘89” (*Rodina ’89*) carried out in January 1989 on a total sample of 3,719 pupils in their 8th year of education. The respondents were sampled from 8th graders of 44 basic schools chosen so as to cover the basic types of regions, size of

settlements and types of built-up areas (typological selection).⁸ The questionnaires for the pupils contained questions concerning educational and occupational aspirations and plans, perception of social inequalities, beliefs about life-success, cultural activities and leisure time, standard of living, etc. As a part of the survey, the pupils were exposed to the Czech version of Cattell's "High School Personality Questionnaire" prepared by K. Balcar (Balcar 1986; Cattell 1960).⁹ This survey was followed by a survey of the pupils' parents; the filled-in questionnaire was returned, after several reminders, by a total of 2,709 families (73% response rate). Respondents (parents) were asked questions about themselves, their partners and other members of the household. The questionnaire for parents was aimed at assessing basic social and demographic data, the family's lifestyle, cultural participation, social contacts, beliefs about life-success, expectations regarding their children's future achievements, etc.

The data from the year 2003 comes from the PISA-L survey carried out by the Department of Education and Stratification of the Institute of Sociology of the Academy of Sciences of the Czech Republic based on the PISA 2003 international survey. The target group of the PISA 2003 survey was pupils born in the calendar year 1987 attending school in 2003. A two-stage sampling procedure was used in accordance with the OECD guidelines. First, schools were selected randomly from the database of all schools attended by pupils born in the calendar year 1987 (with the exception of remedial schools and schools for children with disability); pupils were then selected within those schools. The sample was stratified according to the type of school/study program (primary school, multi-year grammar school, 4-year grammar school, secondary vocational program with a school-leaving exam, secondary vocational program without a school-leaving exam, special school). It was possible for schools providing several types of study programs to be selected within all the types of study programs (i.e. they entered the sampling procedure repeatedly). A similar procedure was applied to obtain a larger representative sample of pupils in 9th grade primary school and the corresponding grades of multi-year gymnasias. The data file that was entered into the international data file and contained responses from 6320 pupils from 260 schools (representing a school population of 121,183 pupils). The additional sample of 9th graders contained 6340 pupils from 148 schools (representing a school population of 116,968 pupils) of this specific target group.

For the analyses presented in this paper, we have chosen the sample closest in its nature to the 1989 data set, i.e. the 9th grade respondents from the PISA 2003, as well as from the questionnaire "Addendum to the Student Questionnaire" and from the Questionnaire for Parents.¹⁰ There are 2,479 cases in total in the analytical data file.

The variables for the analysis of the role of education in life-success among parents were in both cases chosen from quite extensive batteries of items. Only those items were selected that appeared in the questionnaires for parents in both years. In 1989 the question introducing individual items was: "What do you believe your child should be able to do or have in order to be successful in his/her life?" In 2003 the question was phrased in a slightly different way: "What

⁸ Details about the survey may be found in the survey report by Matějů, Tuček and Rezler (1991), which is published on the www.stratif.cz website in the Files to Download section.

⁹ This personality questionnaire was selected mainly for the reason that apart from other personality characteristics it measured also *crystalline intelligence* (factor B) related mainly to *verbal* experience and reflecting the ability of logical reasoning (for details see Matějů, Tuček and Rezler 1991, pp. 30 - 33, Balcar 1986).

¹⁰ All the named questionnaires may be found on the website of the Social Stratification Research Department in the section Projects, Educational Inequalities PISA-L, Questionnaires. (www.stratif.cz/?operation=display&id=63).

do you believe is important nowadays for a young person to get ahead in life, to be successful?" A four-point Likert scale was used to answer individual items.¹¹ In 1989 only one parent answered, in 2004 both parents did. The individual items as well as frequency distributions are shown in table A1 in the Appendix.

Pupils' beliefs about life-success were ascertained in 1989 by the following question: "*What should a person do to get ahead in life?"* As in the analysis of parents, individual variables were transformed so that a higher value represented higher importance. In 2003, pupils' beliefs about life-success were assessed in the same way as their parents.' The question was phrased "*How important do you believe the following items to be for a young person to get ahead in life?"* The individual items are listed in tables A1 and A2 in the Appendix.

Educational aspirations of pupils in 1989 were ascertained by two questions. The first one was: "*You will finish primary school this year and will be deciding what next. Try to imagine for a moment that you will be deciding by yourself with no one influencing you. What would you decide to do when you finish the 8th grade?"* The options were as follows: 1. I would like to start earning money right away and would not go to school anymore; 2. I would apply for an apprentice program without secondary school-leaving exam¹²; 3. I would apply for an apprentice program with a secondary school-leaving exam; 4. I would like to study at a secondary vocational school with a school-leaving exam; 5. I would like to study at a grammar school. The second question was: "*Would you like to study at a college or university?"* Answers: 1. definitely yes; 2. I am not quite sure yet, but probably yes; 3. I am not quite sure yet, but probably not; 4. definitely not. Principal component analysis was applied to define the analytical variable EDUASP (a single factor was extracted).

Educational aspirations of pupils in 2003 were ascertained by several questions. The first question was: "*What education would you like to attain?"* (Answers: 1. apprenticeship without secondary school-leaving exam; 2. apprenticeship with a school-leaving exam; 3. secondary vocational school with a school-leaving exam; 4. grammar school; 5. tertiary vocational school; 6. university or college). We also used answers to four questions concerning the child's life plans: "*The job I will some day have will depend on my education*"; "*In order to achieve what I really want I will have to go to a university/college*"; "*I think I would enjoy going to a university/college*"; "*I think I am able to successfully graduate from a university/college.*" These questions were answered by four-point scale: 1. strongly disagree - 4. strongly agree. Similar to the 1989 data, principal component analysis was applied to identify the analytical variable EDUASP (a single factor was identified by the analysis).

In 1989, abilities were measured by a High School Personality Questionnaire (HSPQ). The variable ABIL was created as a normalized coefficient of "crystallized intelligence" (see Cattell 1960, Balcar 1986). The 2003 ABIL variable was calculated from the averages of plausible values, four dimensions of literacy tested in the PISA 2003 survey (mathematical literacy, reading literacy, scientific literacy and problem-solving). The resulting ABIL variable was obtained through a principle component analysis (one sole factor with even factor weights: 0.957, 0.939, 0.963 and 0.971).

¹¹ In 1989: 1. definitely yes, 2. rather yes, 3. rather no, 4. definitely no; in 2003: 1. very important, 2. quite important, 3. not very important, 4. totally unimportant. The scales for analyses were transformed so that a higher value represented higher importance.

¹² A secondary school-leaving exam ("maturitní zkouška" in Czech) is required for entry to tertiary education (college or university).

The socio-economic status of the family was represented by the education of the more educated parent (EDU-H), the index of socio-economic status of the occupation of the parent with a higher index (ISEI-H) and the total income of the household (INCOME).

As for the chosen methodology, a structural model for each year has been designed to assess differences in the internal structure of family socioeconomic status (SES dimension), its direct and indirect impact on educational aspirations, the effects of children's mental ability (cognitive dimension) and the perceived role of education in life success among parents and children (social psychological dimension). The structural model derived from the theoretical causal model (Diagram 1) was tested on the data from 1989 and 2003 surveys, and is shown in Diagram 2.

<Diagram 2 about here>

Perceived importance of education in life-success and college aspirations: 1989 - 2003

Figure 1 compares parents' perceived importance of education for life-success in 1989 and 2003. While we should stress that the surveys are not directly comparable, the data does suggest a major increase in the number of parents in 2003 who strongly believe in the importance of attaining as much education as possible. Both fathers and mothers registered similar responses. In addition to the increased value of education for life-success, from 1989 to 2003 there has also been an increase in parents' perception of the importance of knowing foreign languages, as well as a decline in the importance of hard work and in political engagement (Tables A1 and A2). These findings can be easily interpreted in light of the structural changes in economic conditions between the two periods.

<Figure 1 about here>

The change in pupils' perceived importance of education for life-success from 1989 to 2003 is even more dramatic than that of their parents (Figure 2). While roughly 44% of both boys and girls in 1989 believed in the importance of education for life-success (i.e. those who agreed and strongly agreed), about 95% of boys and girls in 2003 had the same perceptions. Arguably, the generational differences in perceptions between parents and their children could be attributed to the legacies of communism. While parents in 2003, who were socialized by the prior regime in believing that hard work was more important than education for life-success, may have changed their perceptions gradually over time, pupils in 2003 do not have those legacies, and in fact grew up in a world of rapid changes in economic fortunes (in many different senses), where higher education could be seen as the key difference between those moving up and down the economic ladder. In addition to the perceived importance of education for life-success, from 1989 to 2003 there has been an increase in pupils' perception of the importance of hard work and political engagement (i.e. the opposite trend as their parents). The latter finding is particularly interesting, as it may indicate that at least some pupils are internalizing the belief that those who have benefited the most from the economic transition achieved success partly on the basis of corruption or political ties (Tables A1 and A2).

<Figure 2 and Figure 3 about here>

Lastly, Figure 3 compares the college aspirations of pupils in 1989 and 2003. The data indicates that there has been roughly a three-fold increase in aspirations between those years, with girls showing an even larger increase in aspirations than boys. While the data is striking, it does not

provide any information about the determinants of aspirations at these different periods of time, which we will now seek to uncover.

Causal Model for Educational Aspirations

On the basis of our main hypotheses, we have developed a structural model of the determinants of educational aspirations (Diagram 2). The measurement part of the structural model defines the latent variable representing socio-economic status of the pupil's family (FAMSES), measured by the education of the higher educated parent (EDU_H), the socio-economic status of the parent whose occupation has a higher score on the ISEI index (ISEI_H), and the total income of the family (FAMINC). The structural part of the model is composed of measured abilities (ABIL),¹³ the perceived importance of education for life-success by pupils (D_EDU) and by their parents (R_EDU), and the educational aspirations of pupils (EDUASP). The model was tested on correlation matrices (see Table A3 in the Appendix).

The model represents the input hypothesis according to which pupils' educational aspirations are primarily affected by social origin, either directly (parameter g_{41}) or through their parents' beliefs about the importance of education for life-success (effect $g_{31} * b_{43}$). In addition, family socio-economic status also impacts aspirations through the mediation of pupils' scholastic ability. This effect is both direct (b_{41}) and indirect: ability reinforces the importance pupils attach to education for life-success ($b_{21} * b_{42}$). We also assume that a pupils' higher level of ability strengthens the importance parents attach to education and therefore strengthens also their influence on educational aspirations ($b_{31} * b_{43}$, $b_{31} * b_{23} * b_{42}$).

This complex causal hypothesis proved to be formally acceptable and suitable for the data from both surveys.¹⁴ Before we discuss the model parameters directly linked to the causal hypothesis, we should first mention an important difference in the measurement model for the socio-economic status of the background family (FAMSES), namely the role of family income (FAMINC). In 1989, income had a negligible impact on aspirations in comparison with education and socio-economic status ($l_{31}=0.128$ vs. $l_{21}=0.849$, $l_{11}=0.873$), whereas in 2003 this component of the latent variable FAMSES plays much stronger role ($l_{31}=0.623$ vs. $l_{11}=0.843$, $l_{21}=0.797$). In other words, the measurement model for the latent variable FAMSES indirectly confirms that there has been a fundamental change in the consistency of socio-economic status brought about by the economic transition, a conclusion we have reached in another paper (Matějů and Kreidl, 2001).

In terms of the structural part of the model, consisting of the variables FAMSES, ABIL, R_EDU, D_EDU and EDUASP, we have to bear in mind while interpreting its parameters that two of the variables were not measured in the same way. Measured ability (ABIL) was measured as "crystalline intelligence" in 1989, whereas in 2003 it was measured as an index composed of pupils' literacy skills (reading literacy, mathematical and scientific literacy, problem-solving skills). The variable EDUASP is represented by a factor score in both years; nevertheless the variables entering the factor analysis were not based on questions with the same wording. Therefore, it must be emphasized once again that it is necessary to proceed with caution when

¹³ Due to different scales used in the two years, variables FAMINC and ABIL were standardized by transforming them into z-scores.

¹⁴ All the relevant statistics of model fit are listed under Tables 1 and 2 and 10 (chi/df, p, GFI), which indicate a very good fit.

comparing the model parameters, which might be directly influenced by the above mentioned variables. For this reason, we concentrate on some clusters of causal relationships which are of particular consequence.

<Tables 1 and 2 about here>

It can be generally stated that the ability of the model to explain differences in educational aspirations is very good: the explained variance of educational aspirations exceeded 40% in both years (r^2 0.449 and 0.376). From the results displayed in Tables 1, 2 and 3 it is further clear that the direct effect of social origin on educational aspirations (g_{41}) is much stronger in the model for 1989 (0.421) than 2003 (0.185). Although there are smaller differences in the total effects of social status on aspirations between the years (0.582 and 0.413), this effect remains stronger in 1989. The same applies to the effect of socio-economic background on parents' perceived importance of education for life-success (g_{31}). In 1989, this impact was several times higher than in 2003 (0.227 and 0.069).

<Table 3 about here>

Everything indicates that in 2003 the impact of social origin on educational aspirations was affected to a much greater extent through the abilities of the children (ABIL) and through the perceived "value" of education both by children and their parents (D_EDU, R_EDU), rather than directly. If we compare direct and total effects of social origin on educational aspirations (see Table 3), we find that in 1989 the direct effect represented 72% of the total effect, while in 2003 it was only 45%. The effect of social origin on pupils' aspirations, as mediated through abilities ($g_{11} * b_{41}$), amounted to 0.105 in 1989, representing 18% of the total effect, whereas in 2003 it reached 0.203, representing 49% of the total effect. To give an overall evaluation of the causal determination of pupils' educational aspirations, we divided the whole model into three theoretically relevant parts, with one (M1) representing the direct influence of parents on aspirations (g_{41}), the second one (M2) representing the indirect influence of parents through the importance they prescribe to education [$(g_{31} * b_{43}) + (g_{31} * b_{23} * b_{42})$] and the third (M3) representing the influence of the background family on educational aspirations solely through the children's abilities and the perceived importance of education among children [$(g_{11} * b_{41}) + (g_{11} * b_{21} * b_{42}) + (g_{11} * b_{31} * b_{43}) + (g_{11} * b_{31} * b_{23} * b_{43})$]. The drop in the effect of parents is partly due to the decline in the effect of the perceived value of education by parents (model M2 in Table 3). In 1989, this part of the model explained 5.8% of the total impact of socio-economic background on aspirations, whereas in 2003 it represented only 2.3%. On the other hand, the role of perceived value of education among children (model M3 in Table 3) almost doubled (from 0.115 to 0.213) explaining 19.7% of the total effect of socio-economic background on aspirations in 1989, while in 2003 it explained 51.8% of the total effects.

A multi-sample analysis was applied to test the statistical significance of differences between coefficients for individual years. In order to reduce the potential influence of different measurement protocols for the variable ability (ABIL), two equality constraints were set prior to testing the differences between the relevant coefficients, namely the effect of family background on ability (g_{11}) and the correlation between parents' education and pupil's ability (r_{11}).¹⁵ The results of our test of the differences between coefficient estimates for 1989 and 2003, which are displayed in Table 4, reveal that our hypothesis predicting a stronger direct effect of family background on aspirations in 1989 has been confirmed (χ^2 associated with the equality constraint

¹⁵ In terms of equality constraints, the baseline model was defined as follows: $g_{111} = g_{112}$ and $r_{111} = r_{112}$.

for coefficient g_{41} amounts to 44.5 with 1 degree of freedom). In addition, estimates of other relevant coefficients show significant differences between 1989 and 2003 namely b_{42} ($d_edu \rightarrow eduasp$) and b_{41} ($abil \rightarrow eduasp$), which supports our hypothesis about significant change in the overall structure of the determination of educational aspirations during the transformation period. Differences in the values of these two coefficients for 1989 and 2003 suggest that in 2003 educational aspirations were strongly determined by characteristics of pupils themselves (their measured ability and their perceived role of education for getting ahead in life) rather than by family background characteristics and values shared by their parents.

Multi-sample analysis was applied also to assess gender-based differences in the determination of educational aspirations. Model coefficients, displayed in Table 5, were estimated separately for boys and girls for both 1989 and 2003. At first glance, these differences are rather small, especially in 1989, when none of the relevant coefficients shows statistically different estimates for boys and girls. In 2003, three coefficients show statistically different values for boys and girls, namely b_{41} ($abil \rightarrow eduasp$), b_{23} ($r_edu \rightarrow d_edu$), and g_{31} ($famses \rightarrow r_edu$). Significantly higher values of b_{41} for boys and b_{23} for girls indicate that boys' educational aspirations are formed more under the influence of their ability and less by parental values, whereas girls tend to be influenced by parental values more than boys, experiencing weaker constraints from their measured ability.

We can interpret these findings to suggest that the socialist education system, at least in 1989, 'socialized' pupils to the degree that gender differences did not play any role in shaping the factors that determined educational aspirations. However, in 2003, highly significant differences between boys and girls in estimates of the coefficient g_{31} ($famses \rightarrow r_edu$) suggest that, everything else being equal, higher social status of the background family generates stronger emphasis of parents on the role of education in life-success *vis-a-vis* boys than girls. This means that parents may have different expectations of boys and girls regarding the role of education in their life-success. In other words, boys in higher social status families are exposed to a stronger pressure towards achieving higher education than girls. From a gender perspective, this suggests that more traditional or patriarchal norms about the expected behavior of boys and girls have taken root in the transition period.

Conclusions

The main objective of the paper was to assess historical change in the determination of educational aspirations during the process of political, social and economic transformation in the Czech Republic, namely in the period defined by the years 1989 and 2003, when similar surveys were carried out on pupils in the last grade of elementary school. Our prior research on educational aspirations has shown that the Czech Republic is among the OECD countries in which educational aspirations are very strongly determined by socio-economic background and measured ability. This is particularly due to the high degree of stratification of the educational system at the primary and secondary level, as well as the still quite elitist nature of the tertiary system (demand highly exceeding the supply of educational opportunities; it is still a quite unitary system that is only slowly adopting binary principles, etc.).

The principal objective of this paper was to test hypotheses on historical change in the determination of educational aspirations of adolescents formed and key relationships between socio-economic background, measured ability, and the perceived importance of education for

life-success among parents and their children. Our analyses were directed by four major hypotheses. First of all, we hypothesized that the direct effect social origin on aspirations has diminished during the period under the study, while the effect of ability on aspirations has grown. As for the role of the perceived value of education, we assumed that due to a significant increase in economic returns on education (reported by all available studies of wage and income differentiation), there has been a general increase in the perceived importance of education for life-success and, therefore, an enormous growth in educational aspirations. As a consequence, we hypothesized that the effect of parental SES on the perceived value of education among parents and children has weakened during the transformation. Since the educational system has not changed its quite elitist structure (high degree of differentiation and vocational specificity, early tracking, the existence of dead end tracks, a low admissions rate to tertiary education, etc.), we hypothesized that despite all of these changes, the total effect of social origin on educational aspirations has not changed and has remained very strong.

These hypotheses have been transformed into a causal model subjected to testing. Statistics of model fit have proven that the structural model was an adequate formal representation of our general hypothesis on the causal relationships between variables for both years (1989, 2003). The analysis of the relevant coefficients of the structural model has shown that our hypotheses found strong support in the data.

First of all, the data proved that the perceived importance of higher education for life-success has dramatically increased between 1989 and 2003, particularly among pupils. Consequently, pupils' educational aspirations have significantly increased as well. While only 17% of ninth-graders stated they would definitely wish to attain a university/college education in 1989, it was nearly 50% in 2003.

The results from the structural model support, first of all, the assumption that during socialism, the low level of educational aspirations combined with the very limited supply of high education opportunities made education a quite an "exclusive" asset, which therefore became a part of the intergenerational transmission of advantages, both *directly* and *indirectly* through the perceived "value of education" among parents transferred to their children. In other words, under socialism higher education was in demand but, in view of its relatively low economic return, was a strategy for life-success mostly for families with the highest cultural status defined to a decisive degree by their education. In general, we can speak of the key role of higher education in the reproduction of the "cultural elite." This was manifested in the model by a very strong direct influence of family socio-economic status (in which income played a very small part) on the educational aspirations of children (sub-model M1), on the one hand, but also through the fact that most of the indirect effect was transferred through the importance attached to education by parents as an instrument of life-success, on the other (M2). These two segments of the model (M1 and M2) accounted for more than three-fourths of the total effect of the source family on educational aspirations of children in 1989.

As for the situation in 2003, the results support the assumption that the entire causal structure has changed significantly. The most important difference between coefficients of the model for 1989 and 2003 consists in the fact that the *direct* effect of socio-economic background has dramatically decreased (by 56%), while its total effect weakened to much lesser degree (only by 30%). An even greater change has been found in the role of the perceived importance of education for life success among children compared to the role of the "value of education" among parents. While the role of the former has dramatically increased, the latter has weakened. Also, it has to be

emphasized that even though the change in coefficients pertaining to the role of ability in shaping aspirations must be interpreted with some caution (ability was not measured by identical instruments), the results of multi-sample analysis, which partly controlled the potential effect of different measurement protocols, proved that the increase of its direct and indirect effects on aspirations is evident.

Despite all these significant changes in the structure of the causal determination of educational aspirations between 1989 and 2003, which evidences a certain “meritocratization” of the general pattern of determination, the overall degree of determination has remained very strong. What used to be, during socialism, the direct intergenerational transfer of education as a predominantly cultural asset, has become primarily the outcome of tough competition for a highly valued “economic” asset, in which children from disadvantaged social strata tend to lose largely because, under given circumstances, they do not develop adequate educational aspirations. This conclusion also corresponds to the results of our prior comparative research of the formation of educational aspirations in OECD countries.

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Tables and Figures

Diagram 1: Theoretical causal model

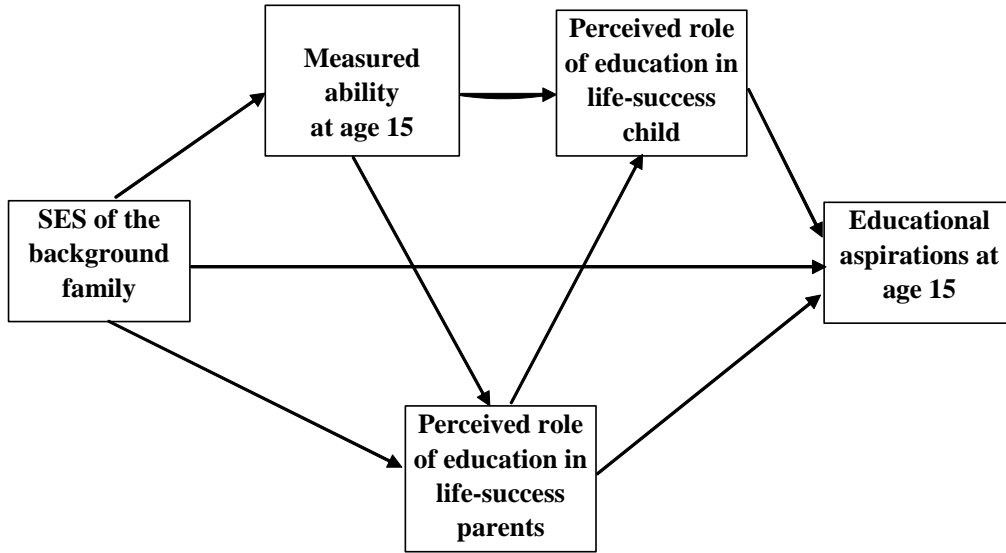


Figure 1. The perceived importance of education for life-success in the generations of parents in 1989 and 2003

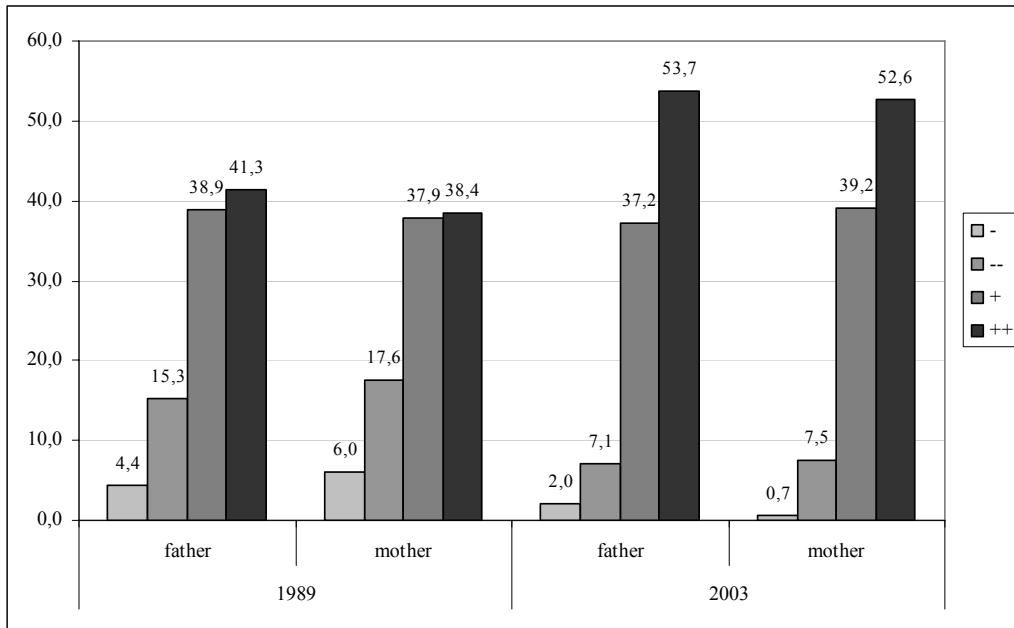


Figure 2. The perceived importance of education for life-success in the generations of children in 1989 and 2003

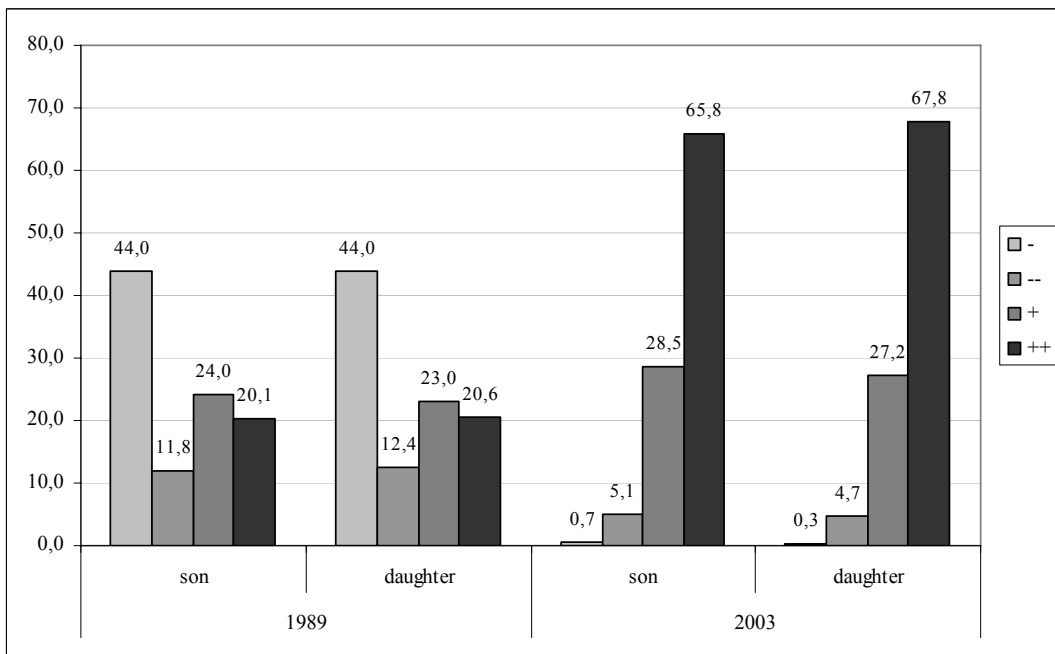


Figure 3. College aspirations in 1989 and 2003 among pupils in the last grade of elementary school.

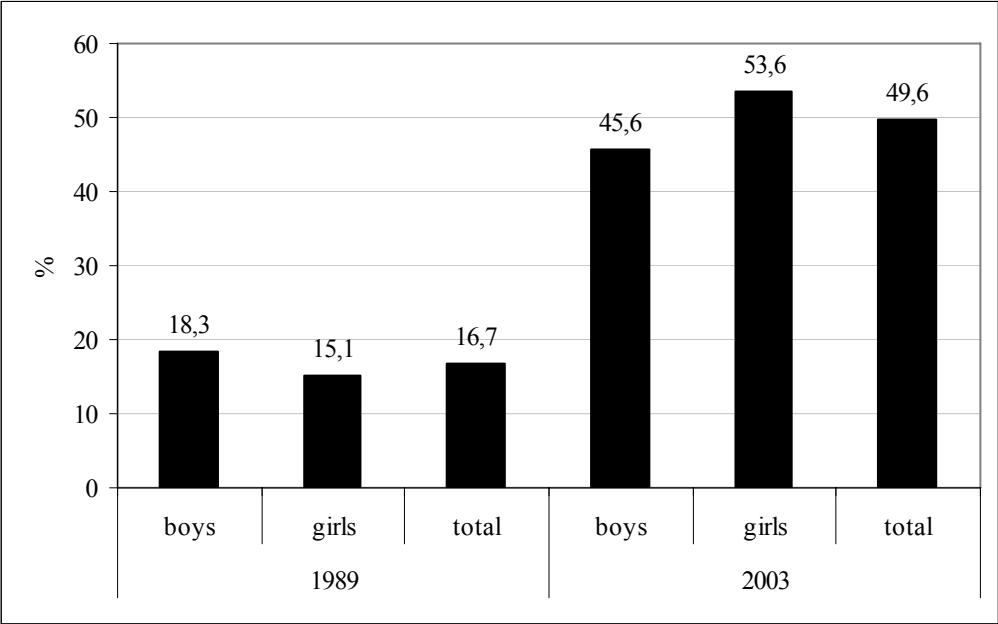


Diagram 2: Structural model

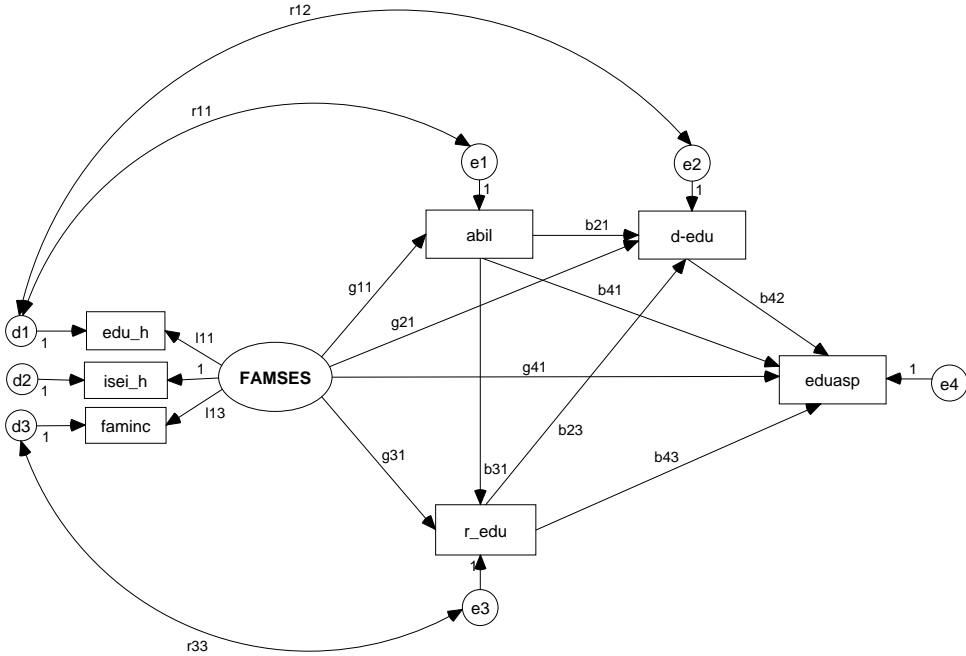


Table 1. Model parameters, effects, and standardized coefficients - 1989

Parameter	Effect	coefficient	s.e.	c.r.	p
g11	famses → abil	0.377	0.029	13.063	0.000
g31	famses → r_educ	0.227	0.027	8.417	0.000
b31	abil → r_educ	0.120	0.025	4.823	0.000
b23	r_educ → d_educ	0.076	0.024	3.123	0.006
g21	famses → d_educ	0.119	0.031	3.799	0.002
b21	abil → d_educ	0.069	0.026	2.675	0.000
l31	famses → faminc	0.128	0.025	5.090	0.000
l21	famses → iseh	0.849	n		n
l11	famses → edu_h	0.873	0.032	27.065	0.000
b42	d_educ → eduasp	0.107	0.019	5.662	0.000
b43	r_educ → eduasp	0.140	0.019	7.402	0.000
b41	abil → eduasp	0.279	0.021	13.574	0.000
g41	famses → eduasp	0.421	0.024	17.633	0.000
r11	d1 ↔ e1	-0.010	0.043	-0.234	0.859
r33	d3 ↔ e3	0.015	0.024	0.621	0.233
r12	d1 ↔ e2	-0.063	0.036	-1.743	0.081

N=1820, Chisq=5.834, df=5, p=0.371, GFI=0.999 AGFI=0.995 BIC=222.8

Table 2. Model parameters, effects, and standardized coefficients - 2003

Parameter	Effect	coefficient	s.e.	c.r.	p
g11	famses → abil	0.473	0.025	18.988	0.000
g31	famses → r_edu	0.069	0.026	2.653	0.008
b31	abil → r_edu	0.113	0.023	4.866	0.000
b23	r_edu → d_edu	0.101	0.020	5.025	0.000
g21	famses → d_edu	0.021	0.027	0.764	0.445
b21	abil → d_edu	0.029	0.024	1.196	0.232
l31	famses → faminc	0.623	0.021	29.025	0.000
l21	famses → isei_h	0.797	n	n	n
l11	famses → edu_h	0.843	0.026	32.501	0.000
b42	d_edu → eduasp	0.172	0.016	10.660	0.000
b43	r_edu → eduasp	0.120	0.016	7.385	0.000
b41	abil → eduasp	0.431	0.019	22.827	0.000
g41	famses → eduasp	0.185	0.021	8.850	0.000
r11	d1 ↔ e1	0.089	0.034	2.588	0.010
r33	d3 ↔ e3	0.060	0.021	2.794	0.005
r12	d1 ↔ e2	0.073	0.028	2.592	0.010

N=2478, Chisq=14.464, df=5, p=0.013, GFI=0.998 AGFI=0.991, BIC=238,9

Table 3. Decomposition of the total effect of social background on aspirations

Part of the model and composition of the respective effect	Standardized coefficient		Proportion from the total effect of FAMSES on EDUASP	
	1989	2003	1989	2003
M1 (g ₄₁) direct effect of FAMSES	0.421	0.185	72.3%	44.9%
M2 (g ₃₁ *b ₄₃)+(g ₃₁ *b ₂₃ *b ₄₂) effect of FAMSES trough the perceived importance of education among parents	0.034	0.009	5.8 %	2.3%
M3 (g ₁₁ *b ₄₁) +(g ₁₁ *b ₂₁ *b ₄₂) +(g ₁₁ *b ₃₁ *b ₄₃) + (g ₁₁ *b ₃₁ *b ₂₃ *b ₄₃) effect of FAMSES trough ABILITY and the perceived importance of education among children	0.115	0.213	19.7%	51.8%
Total effect	0.582	0.413	100.0 %	100.0%

Table 4. Tests of equality constraints imposed on selected coefficients in models for 1989 and 2003 (multi-sample analysis). All test are based on the assumption that the model with coefficients g11 and r11 set equal is correct.

Model	Effect set to be equal	DF	Chisq	p
(g11+r11)+g41	famses → eduasp	1	44.493	0.000
(g11+r11)+b42	d_educ → eduasp	1	72.101	0.000
(g11+r11)+b43	r_educ → eduasp	1	0.464	0.496
(g11+r11)+b23	r_educ → d_educ	1	2.640	0.104
(g11+r11)+g31	famses → r_educ	1	24.105	0.000
(g11+r11)+g21	famses → d_educ	1	12.340	0.000
(g11+r11)+b41	abil → eduasp	1	31.600	0.000
(g11+r11)+b31	abil → r_educ	1	1.299	0.254
(g11+r11)+b21	abil → d_educ	1	4.846	0.028

Table 5. Selected standardized regression coefficients of the models for 1989 and 2003 estimated separately for boys and girls

Parameter	Effect	Boys 1989	Girls 1989	Boys 2003	Girls 2003
g11	famses → abil	0.393	0.358	0.427	0.513
g31	famses → r_educ	0.215	0.237	0.150	-0.023
b31	abil → r_educ	0.147	0.097	0.079	0.163
b23	r_educ → d_educ	0.079	0.074	0.048	0.153
g21	famses → d_educ	0.107	0.129	0.068	-0.016
b21	abil → d_educ	0.076	0.062	0.051	0.002
b42	d_educ → eduasp	0.137	0.081	0.183	0.154
b43	r_educ → eduasp	0.111	0.171	0.110	0.126
b41	abil → eduasp	0.312	0.283	0.455	0.419
g41	famses → eduasp	0.425	0.415	0.220	0.175
RSQ	edusap	0.489	0.449	0.435	0.347
Total effect	famses → eduasp	0.600	0.567	0.453	0.396
Total effect	abil → eduasp	0.340	0.306	0.473	0.443
Total effect	r_educ → eduasp	0.122	0.177	0.119	0.150

Table 6. Tests of equality constraints imposed on selected coefficients in models for boys and girls (MM: coefficients of measurement model and correlation r_{12} are set equal). All parameters are based on the assumption that the model MM+g11 is correct.

Model	Effect set to be equal	DF	1989		2003	
			Chisq	p	Chisq	p
MM+g11+g31	famses \rightarrow r_educ	1	0.015	0.901	12.835	0.000
MM+g11+g41	famses \rightarrow Eduasp	1	1.602	0.206	3.826	0.050
MM+g11+g21	famses \rightarrow d_educ	1	0.094	0.759	2.652	0.103
MM+g11+b21	abil \rightarrow d_educ	1	0.104	0.747	1.379	0.240
MM+g11+b31	abil \rightarrow r_educ	1	1.292	0.256	3.454	0.063
MM+g11+b41	abil \rightarrow Eduasp	1	1.938	0.164	5.884	0.015
MM+g11+b23	r_educ \rightarrow d_educ	1	0.005	0.943	7.449	0.006
MM+g11+b42	d_educ \rightarrow Eduasp	1	2.961	0.085	2.041	0.153
MM+g11+b43	r_educ \rightarrow Eduasp	1	2.144	0.143	0.038	0.846

Appendix – Wording of items in the questionnaire and distributions

Table A1: Items on life-success strategies - 1989

a) Parents „ *What do you believe your child should be able to do or have in order to be successful in his/her life?* “ (-- definitely not, - rather not + rather yes, ++ definitely yes)

Variable	Wording	--	-	+	++
EDUC	The highest possible education	5,5	16,3	38,5	39,6
LANG	Knowledge of languages	5,8	15,2	42,9	36,0
ASSERT	To know how to assert oneself	1,5	3,7	44,8	36,0
TIES	Influential acquaintances	25,3	34,6	31,1	9,0
WORK	To be capable of working a lot	1,4	4,9	44,1	49,6
POLIT	Political engagement	10,5	30,9	46,4	12,3
MONEY	To know how to make money	4,0	12,9	54,3	28,8
CONFORM	To know how to be inconspicuous	27,5	40,2	23,7	8,7
SELSUF	To be able to do and fix everything oneself	3,7	12,3	41,5	42,5
OPINION	To have one's own convictions	1,0	2,0	15,3	81,7

b) Children „*What should a person do to be successful in life?*“

(--totally unimportant, - not very important, + quite important, ++ very important)

Variable	Wording	--	-	+	++
EDUC	To achieve the highest possible education	44,0	12,1	23,5	20,4
COMPET	To know something better than others	62,0	11,8	12,5	13,7
CONFORM	To get along with everyone	34,5	20,9	17,1	27,5
MONEY	To know where and how to make enough money	95,5	2,7	1,2	0,6
TIES	To have the right ties and acquaintances	60,5	18,1	16,0	5,4
WORK	To work a lot and well	18,5	24,1	26,6	30,7
POLIT	To be politically engaged	85,5	10,2	2,8	1,5

Table A2: Items on life-success strategies - 2003 (distributions after re-weighting to the file composition of the 1989 survey)

a) Parents „*What do you believe is important nowadays for a young person to get ahead in life, to be successful?*” (--totally unimportant., - not very important, + quite important, ++ very important)

Variable	Wording of the item	--	-	+	++
EDUC	To achieve the highest possible education	1,2	7,4	38,3	53,1
LANG	To know as many languages as possible	0,5	6,2	37,4	55,9
ASSERT	To know how to assert oneself in every situation	1,2	15,1	55,0	28,7
TIES	To have as many influential acquaintances as possible	10,9	42,4	37,1	9,5
WORKE	To be willing to dedicate more time to work than others	1,5	17,2	59,5	21,8
POLIT	To be active in politics	41,8	47,5	8,4	2,3
MONEY	To know how to make a lot of money	2,8	24,6	53,3	19,2
CONFROM	To be inconspicuous and to not be very provocative	30,8	43,6	20,5	5,0
SELSUF	To be able to do as many things as possible oneself	4,4	38,3	42,1	25,3
OPINION	To have one's own opinion and convictions	0,3	2,1	25,8	71,7

b) Children „How important do you believe the following items to be for a young person to get ahead in life, *to be successful?*“

(--totally unimportant, - not very important, + quite important, ++ very important)

Variable	Wording of the item	--	-	+	++
EDUC	To achieve the highest possible education	0,5	4,9	28,3	66,3
LANG	To know as many languages as possible	1,1	8,0	36,1	54,7
ASSERT	To know how to assert oneself in every situation	0,4	7,1	47,3	45,1
TIES	To have as many influential acquaintances as possible	8,6	36,3	37,0	18,1
WORKE	To be willing to dedicate more time to work than others	1,2	17,1	54,9	26,8
POLIT	To be active in politics	23,2	54,6	17,8	4,4
MONEY	To know how to make a lot of money	1,1	16,1	51,2	31,6
CONFROM	To be inconspicuous and to not be very provocative	10,5	43,3	35,9	10,2
SELSUF	To be able to do as many things as possible oneself	0,8	12,5	45,6	41,1
OPINION	To have one's own opinion and convictions	0,3	2,9	32,2	64,7

Table A3: Correlation matrices 1989 and 2003**1989**

N=2478	EDU_H	ISEI_H	FAMINC	ABIL	R_EDU	D_EDU	EDUASP
EDU_H	1,000	0,741	0,103	0,325	0,229	0,114	0,506
ISEI_H	0,741	1,000	0,117	0,320	0,240	0,140	0,491
FAMINC	0,103	0,117	1,000	0,063	0,050	0,057	0,076
ABIL	0,325	0,320	0,063	1,000	0,206	0,130	0,480
R_EDU	0,229	0,240	0,050	0,206	1,000	0,124	0,325
D-EDU	0,114	0,140	0,057	0,130	0,124	1,000	0,230
EDUASP	0,506	0,491	0,076	0,480	0,325	0,230	1,000

2003

N=1820	EDU_H	ISEI_H	FAMINC	ABIL	R_EDU	D_EDU	EDUASP
EDU_H	1,000	0,675	0,519	0,440	0,123	0,082	0,373
ISEI_H	0,675	1,000	0,497	0,366	0,076	0,043	0,314
FAMINC	0,519	0,497	1,000	0,318	0,125	0,019	0,291
ABIL	0,440	0,366	0,318	1,000	0,147	0,054	0,546
R_EDU	0,123	0,076	0,125	0,147	1,000	0,110	0,225
D-EDU	0,082	0,043	0,019	0,054	0,110	1,000	0,218
EDUASP	0,373	0,314	0,291	0,546	0,225	0,218	1,000