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Talented but unaware? An analysis of the role of self-assessment in educational transitions

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Talented but unaware?
An analysis of the role of self-assessment
in educational transition

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Abstract

Why are talented pupils who come from low-status families reluctant to choose knowledge-intensive educational routes? Throughout this paper we try to answer this question, employing the framework of sociological rational choice theory. Our argumentation is that (1) the perception of one's own ability (self-assessment) is dissimilar among pupils with different parental backgrounds. Furthermore, (2) educational choices are influenced not exclusively by ability, but also by subjective beliefs about one's own talent. Finally, (3) educational choices are not identical across social classes, because pupils with different parental backgrounds estimate their own abilities differently. The hypotheses are tested using individual-level panel data from the Hungarian Life Course Survey (HLCS). The sample contains 9,050 pupils (aged 14–15) who finished primary education in the academic year 2005/06, began secondary education in autumn 2006, and tertiary education in 2010 or 2011.

Keywords: self-assessment; self-confidence; transition to secondary and tertiary education; school tracks; inequality in educational opportunities; tracking in education; educational panel data; Hungarian Life Course Survey (HLCS)

JEL classification: D83, J24, I24, J62

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Az önértékelés szerepe a továbbtanulási döntésekben

Tamás Keller

Összefoglaló

A tanulmány annak a kérdésnek a megválaszolásához kíván hozzájárulni, hogy milyen tényezők állhatnak a tehetséges, ám alacsony társadalmi státusú diákok alacsony szintű továbbtanulási hajlandósága mögött. A tanulmány fő érvelése szerint az iskolai teljesítmény megítélésében jelentős státuskülönbségek mutathatóak ki, és az alacsonyabb státusú diákok – magasabb státusú társaikhoz képest – módszeresen alábecsülik saját teljesítményüket. A továbbtanulási döntések során nem csupán a tényleges iskolai teljesítmény, hanem annak percepciója is számít. A társadalmi háttér szerint különböző önértékelés tehát hozzájárul a továbbtanulási döntések mögött meghúzódó státuskülönbségekhez. Hipotéziseimet egyéni-szintű panel adatbázison, az Életpálya kutatáson, tesztelem. Mintám 9050, javarészt 14-15 éves, diákot tartalmaz; olyanokat, akik a 2005/06-os tanévben fejezték be általános iskolai tanulmányaikat, 2006 őszén kezdték meg középfokú iskoláikat és 2010 után kezdhették meg főiskolai vagy egyetemi tanulmányaikat.

Tárgyszavak: önértékelés, önbizalom, továbbtanulási döntések, iskolai esélyegyenlőség, panel adatok, Életpálya kutatás

JEL kódok: D83, J24, I24, J62

Köszönetnyilvánítás:

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I. INTRODUCTION

Why are low-status pupils less likely to choose knowledge-intensive educational routes? This paper aims to build on previous research into educational decisions and inequality in educational opportunities, and seeks answers in the framework of rational choice models in sociology, with a focus on understanding status differences in educational transitions. As a new aspect, it investigates the class differences in subjective estimations about pupils' own abilities; these could be linked to the parameter of *success probability* in rational choice models and could be psychological in character. That said, the theoretical part of the paper builds on the already established bridge between two streams of research: inequality of educational opportunity and self-estimation.

The literature of educational inequality acknowledges strong status differences in pupils' educational performance (Checchi, 2006). This vein of research also understands that the impact of parental background (usually measured as the occupational or educational status of parents) is not restricted to differences in primary factors – such as ability or school performance – but also has secondary effects, which manifest themselves in (often non-cognitive or non-rational) factors that contribute to socially different educational decisions (Boudon, 1974). Our knowledge is, however, rather limited as to whether status differences in non-cognitive factors are responsible for the same differences in educational outcomes. This is quite surprising, as it is over thirty years since Murphy (1981) suggested concentrating more on socially unequally distributed educational aspirations (as non-cognitive factors) in educational inequality research; and yet there is hardly any empirical evidence.

In this research our main aim is to find out whether the perception of one's own abilities (self-assessment) is differently distributed according to social status, and whether these differences are responsible for choosing different educational routes. Underestimated ability might have an impact on educational decisions, because unrecognized personal talent could stand in the way of people choosing a knowledge-intensive educational route (Sjögren and Sällström, 2004), simply because they do not dare to obtain better school qualifications, which they could easily have done had they only tried. Overestimated ability, on the other hand – if someone overrates his own talent – might increase the probability of failure. Despite this risk, however, as Filippin and Paccagnella (2011) showed in their model, those who initially overestimate their abilities will follow more ambitious educational roads if they have access to a greater volume of knowledge. The increase in knowledge accumulated will be translated to narrowing the gap in human capital between those with and without self-confidence.

The main contribution of this paper to previous findings is that the perception of one's own ability (self-assessment) is not similarly distributed among pupils with different parental backgrounds. Lower-status pupils usually underestimate their abilities, even at the same objective level. Among adolescents with the same skill level and grade point average, those who have greater confidence in their abilities have a better chance of choosing a knowledge-intensive educational route. The results also support the finding that the gap between low- and high-status pupils in terms of their educational decisions could be explained by their different levels of self-assessment.

II. EDUCATIONAL TRANSITIONS AND MAINTAINED INEQUALITIES

II.1. PREVIOUS RESEARCH FINDINGS

Stocké et al. (2011) claim that there are several theoretical frameworks to explain inequalities in educational opportunities. Rational choice theory rose to its relative importance among the other theories after Boudon's (1974) seminal work, in which he explained that the impact of social background also manifests itself in the form of different educational decisions made at the same level of ability. The core question of rational choice theories in sociology after Boudon has been to find out why pupils in different social classes make different educational decisions, even if their abilities are the same.

Class differences in educational decisions emerge because social classes are different in at least three characteristics: risk aversion, expectation of success and resources (Breen and Goldthorpe, 1997). Relative risk aversion means that people in every social class strive to maintain the same status from an intergenerational perspective. Individuals believe that by reaching a particular educational threshold, they will reach the same social class position as their parents. The cost of pursuing any further education (in terms of real cost, forgone earning, risk of failure to complete) outweighs the utility of opting for more education (Breen and Yaish, 2006). Social classes also differ in terms of ability and interpretation of success. Higher social classes have higher-level ability, and differences in ability are believed to capture differences in the subjective estimation of success, if pupils derive self-belief from previous success, and if previous failure destroys optimism for success. This also means that pupils in lower social groups should have a greater assurance of success if they choose the same educational outcomes as their peers in more advantaged social classes. Lastly, social classes have different levels of resources, in terms of direct material resources (to buy textbooks, pay tuition fees) and the tolerance of opportunity costs in the form of forgone earnings and benefits.

There have been several empirical attempts to prove sociological rational action theory. Need and Jong (2000) investigated the decision of whether to go on to tertiary education, using Dutch panel data. They found that educational choice is highly determined by the educational aspirations (the desired degree) of pupils – even after controlling for grade point average, subjective ability (the level of education that pupils thought they could complete at best) and the net monthly family income of parents. Hartlaub and Schneider (2012) used data from the German Socioeconomic Panel Study and distinguished between structural (a family's social status) and individual (personal willingness to avoid risk) risk aversion. Based on their findings – after controlling for grade point average and disposable family income – students in upper social classes are structurally almost compelled to choose academically oriented educational courses. Working-class children, however, have more 'freedom' in this choice, which is also influenced by individual risk aversion. Explaining schooling ambitions, van de Werfhorst and Hofstede (2007) have similar results, finding relative risk aversion to be a relevant factor in the explanation. Stocké (2007) used German panel data to explain class differences in the choice of secondary school. He found the chances of a child's success in further education, as estimated by the parents, to be the strongest predictor in the decision to choose between various secondary school tracks (*Hauptschule, Realschule, Gymnasium*).

From the psychological side of our research emerge two major concepts: self-esteem and self-efficacy. James (1890: 310) introduced the notion of self-esteem, which is the success achieved by a person, relative to that person's expectations of himself. If someone has high self-esteem, he either has good performance (large numerator) or low expectations (small denominator). Self-esteem (operationalized by Rosenberg, 1965) is considered to maintain protection against psychological or physical stress arising from the fear of performing badly (Himmler and Koenig, 2012), which could explain why it is important in educational decisions. Its positive impact on educational outcomes (Heckman, Stixrud and Urzua, 2006) is challenged by the findings of Himmler and Koenig. Whereas self-esteem belongs to feelings about oneself, self-efficacy is the capacity to accomplish tasks successfully (Bandura, 1982). Since judgements of success determine personal motivation (e.g. persistence in striving to attain a particular goal), self-efficacy influences learning activities via such self-regulatory processes as setting goals, evaluating one's own performance or choosing an appropriate strategy to achieve the intended goal (Zimmerman, 2000: 87). As people engage in tasks where they think they will succeed, self-efficacy is believed to be a powerful predictor of choice of career or university majors (empirical evidence is summarized by Pajares, 1996). Other empirical research supports the notion that children's beliefs about their own ability and their expectation of success strongly influence educational outcomes, even if previous performance is controlled for (Wigfield & Eccles, 2000).

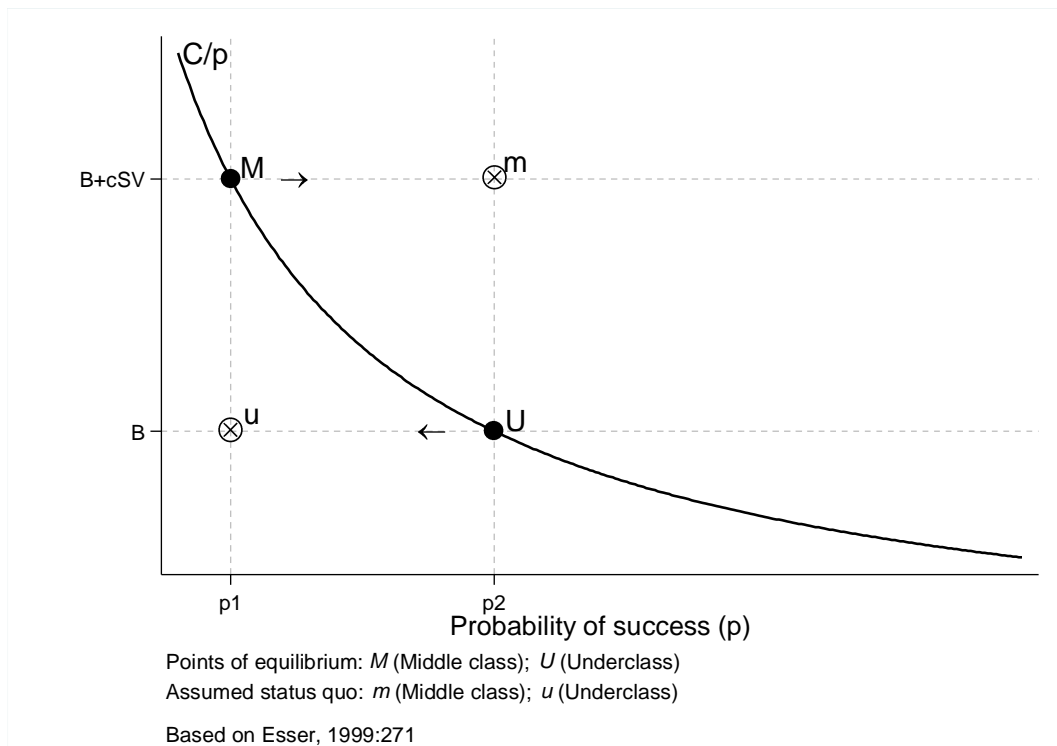
There are two features of these notions (self-esteem, self-efficacy) which play a crucial role in our research: the link to real (school) performance, and the importance of social comparison. Particularly self-efficacy depends strongly on constructive feedback about performance and on prior success (Schunk, 1985). Empirical research has shown that 3rd graders who received feedback about their ability performed better at school (Schunk, 1983). Social comparison theory in self-concept (Marsh and Hau, 2003; Marsh & Yeung, 1998; Marsh et al., 2008) assumes that academic self-concept is positively influenced by one's own performance, but is counterbalanced somewhat by the negative impact of peer performance. The 'big fish, little pond' effect claims that, even if individual academic skills would improve in a strongly selective good school, the gain is mitigated by the fact that strong peer performance decreases individual self-concept and thus – indirectly (through the channel of self-concept) – leads to a decrease in individual performance.

II.2. OUR APPROACH

Esser (1999: 266–75) subtracts two other important class differences from the notions of sociological rational choice theory: investment risk and educational motivation. Investment risk (C/p) is interpreted as cost (C) divided by the perceived probability of success (p), while educational motivation is $U+c \times SV$, where U is the utility of a particular educational option, SV is loss in status if this educational option is not acquired, and c is the perceived probability of this status lost. A particular educational option occurs when educational motivation exceeds investment risk ($U+c \times SV > C/p$). By definition, lower classes have lower educational motivation, because their status could be secured through less-extensive education. Therefore, in the case of lower classes, educational motivation equals U , because $c \times SV$ is close to 0.

Following this framework, educational motivation is always lower in the case of the underclass, because the fear of status loss is ruled out. Assuming C to be constant, investment risk depends only on the perceived probability of success. So pupils in the lowest class – as shown in Figure 1 – should have an educational motivation of at least point p_2 or higher, if they are to opt for the same level of education chosen by their middle-class peers. Middle-class pupils, since they are pushed by the fear of status loss, could attain the same level of education with a lower probability of success. In order to achieve the equilibrium in educational opportunities, pupils from the middle class should be plotted at point M and underclass pupils at point U on the graph. However, again, the widely documented gap in educational performance shows that pupils with different class positions could be quite far away (and in opposite directions) from the equilibrium point; middle-class pupils at m and underclass pupils at u .

The association between educational motivation and probability of success – points of equilibrium and perceived deviation from it, by parental background



From previous literature, however, one can suspect that the probability of success does not compensate for the low level of educational motivation among low-status pupils. Adolescents (and their parents) from a disadvantaged background might underestimate their performance, because they have inaccurate information on the importance of effort and ability in the educational system. Some empirical findings (Sullivan, 2006) reveal this assumption. Pupils were asked to guess the outcome of their GCSE exam a few months before they actually sat it. A comparison of the estimates with the actual results showed that pupils from lower classes systematically underestimated their abilities, compared to their more advantaged peers. Since only a month or so elapsed between the measurement of self-assessed and real performance, reverse causation (with working-class pupils making more rapid progress in the short time before the GCSE exam) could be excluded.

That said, this paper deals with the question of whether subjective estimations about one's own ability play any role in educational transitions. The subjective estimations are interpreted as part of the probability of success in sociological rational choice theory. Since the theory is interested in class differences in educational decisions, this analysis focuses also on class differences in the estimation of own talent and the consequences for future educational transitions.

III. DATA AND DEFINITIONS

III.1 DATA

During empirical analysis, we will use the Hungarian Life Course Survey (HLCS) – an individual panel survey conducted by TÁRKI Social Research Institute on a yearly basis – from the academic year 2006/07, with an initial sample of nearly 10,000 largely 14–15-year-olds (most of whom had embarked on the 9th grade in that academic year). This survey can be merged with 8th grade (from the academic year 2005/06) test scores in mathematics and reading literacy skills for the same students, measured by the Hungarian National Assessment of Basic Competences (NABC) organized by the Hungarian educational authority. NABC contains administrative data about the entire school cohort. The sample of HLCS was selected in 2006 from the population of 8th grade pupils with valid test scores in NABC (see Figure A1 in the Appendix for the design of HLCS).

In the analysis we focus on two educational transitions. These are not the first educational choices that someone makes in his or her life; therefore educational decisions analysed in this paper are already consequences of previous decisions. The reason for focusing even on these choices is that supposedly the transition to secondary education is the first educational decision where pupils themselves have a say (not just their parents). The vast majority of adolescents in the sample (nearly 75 per cent) reported that they made the decision about secondary school (at age 14) alone.

The educational transition analysed first in this paper occurs when pupils are 14–15 years old, when they are in their last year of elementary education (which usually lasts eight years).¹ When pupils are in the 8th grade, at the beginning of the second semester they draw up an order of preference for the secondary school they would like to attend. Pupils are admitted to these schools on the basis of their preference ordering and their results in the admission test and/or school marks; or if there are free places at the school. Elementary school leavers can choose from three school types: secondary general (*gimnázium*) and secondary vocational (*szakközépiskola*) education provide a later opportunity to enter tertiary education, whereas there is no direct entry from a vocational school (*szakiskola*) to tertiary education (see Figure A2 in the Appendix on the educational choices and possible educational scenarios). Since HLCS was launched among 9th graders, the consequences of the choice of secondary education can be analysed (which track pupils are following at the

¹ Pupils also have the opportunity to enter secondary general school after the 4th or the 6th grade. These pupils are usually the most talented. However, for the purposes of this analysis, these students are excluded because of the lack of appropriate data.

beginning of the school year), however the survey provides retrospective information about the previous academic year (see Figure A1 in the Appendix on the design of HLCS).

The second educational transition analysed here occurs after the completion of compulsory education (see Figure A2 in the Appendix on the educational choices and possible educational scenarios). Pupils basically have three options: they can enter tertiary education (college or university); begin post-secondary but not tertiary education; or enter the labour market. In Hungary, there are no general tuition fees for tertiary education: there is a dual system in operation, under which some students pay tuition fees, while others do not. But the vast majority of students study free of charge. The first degree is financed by the state (according to a quota determined annually by the government) in the case of those who obtain an adequate level in the entrance examination. This regulation basically means that approximately every second applicant can study free of charge at university level.² Therefore, in the case of the second educational transition analysed in this paper, the population consists of those who have their high-school final exam (*érettségi*) and have completed secondary education within five years of commencing it (there are no data about the respondents later; HLCS has six completed waves). Fee-paying university places usually have lower requirements: pupils are admitted with worse admission tests or school marks; moreover, applications to such places are strongly related to social status. The dependent variable in the second educational decision is, therefore, those who have been admitted to state-financed tertiary educational training.

III.2 DEFINITIONS

The framework used in our research has four important elements: educational transition or choice (the dependent variable), ability, parental background and self-assessment. This section introduces these variables.

We use a very simple classification of educational choice, which is not influenced by the compositional effect of pupils at different schools. At the secondary level, there are three possible scenarios (secondary general school – *gimnázium*; secondary vocational school – *szakközépiskola*; and vocational school – *szakiskola*). The term ‘secondary school’ (*középiskola*) will be used hereafter as a generic term for secondary general and secondary vocational school. In the empirical models, we employ two dummy variables. The first is coded 1 if someone was admitted to secondary school (secondary general or secondary vocational school – the schools from which there is access to tertiary education) and 0 if someone is at a vocational school. The second dependent variable deals with the difference between secondary general school (coded 1) and secondary vocational school (coded 0). The

² http://www.felvi.hu/felveteli/ponthatarok_rangsorok/elmult_evek/!ElmultEvek/elmult_evek.php?stat=4

reason for using binary categories rather than multinomial is that the choice between general and vocational secondary schools is a horizontal decision, while the choice between vocational school and any other kind of secondary school is vertical.³ At the tertiary level we examine those who have been admitted to tertiary education (coded 1) among those who had the possibility – i.e. sat the high-school final exam – of entering tertiary education (coded 0). Table 1 contains the mean, standard deviation and the number of observations for the three dependent variables.

Table 1

Mean, standard deviation and number of cases of the three dependent variables in analysis, by parental background

		Dependent variables used in the analysis		
Parental background		Admitted to secondary school/vocational school	Admitted to secondary general school/secondary vocational school	Admitted to state-financed tertiary education training
Elementary school	mean	45.63%	18.72%	12.53%
	sd	49.82%	39.03%	33.15%
	N	1979	903	391
Vocational school	mean	67.05%	27.71%	21.52%
	sd	47.01%	44.76%	41.11%
	N	3827	2566	1566
High-school final exam	mean	84.70%	39.91%	32.06%
	sd	36.01%	48.99%	46.69%
	N	2189	1854	1235
Tertiary education	mean	94.12%	66.87%	52.03%
	sd	23.53%	47.09%	49.99%
	N	1055	993	713
Total	mean	69.79%	36.16%	29.53%
	sd	45.92%	48.05%	45.62%
	N	9050	6316	3905

Self-assessment is measured using the question: ‘What do you think about your achievement in a test in your 8th grade class where the total available score is 100 and the average in your class is 70?’ Note that this question refers to performance at 8th grade (when students completed the NABC competence test), and so is a kind of retrospective question (it was asked in the first wave of HLCS, when students had already begun 9th grade). Moreover, it is worth mentioning that the wording of the question does not suggest the type of test. One can only guess that the test probably measures some cognitive ability (rather than ability in sport, art, etc.), since the ‘achievement’ is asked. Obviously the question measures self-assessment with noise, but this is the only available proxy for that in the dataset.

³ Results are consistent using multinomial logit; results are available from the author on request.

Ability or academic/school performance is measured by standardized test scores (assessed at 8th grade) in mathematics and reading literacy, and by school marks. Competence scores are regarded as a proxy for ability, and school marks as additional information deriving from the educational system but not connected to ability (teachers' evaluation). Note that even competence scores can be regarded as an outcome of the school system, and therefore be biased. However, this is the only available standardized measure for ability in the survey. We use composite indices for competence scores and for school marks as well. Both measures are a result of principal component analysis (PCA). *Competence-score PCA* uses maths and reading literacy scores as primary variables, and *school-marks PCA* the maths and Hungarian grammar and literature marks (results of PCA and descriptive statistics about the primary variables appear in Tables A1 to A3 in the Appendix). Both school marks and competence scores are measured at the end of the 8th grade academic year, before secondary education begins. If values in school marks are missing, previous semester school marks are used. Pupils with special educational needs (SEN) had only competence scores in reading comprehension available. In order not to lose them from the analysis, missing maths competence scores were replaced with reading comprehension scores (SEN appears among the control variables).

Parental background is defined by the highest level of schooling for the father (biological or stepfather); if information about the father is missing, the mother's highest level of schooling is used.⁴ Occupation is a more frequently used proxy for social class, but unfortunately that is not available in HLCS. We assume anyway that in terms of educational decisions, schooling is a better proxy for social class than is occupation. This assumption is supported by Róbert (1986), who found a strong relationship between parental education and children's educational attainments. Moreover, it is more likely that better-educated parents devote more emphasis to spending time with their children and helping them to build a real self-image.

Descriptive statistics about self-assessment, competence scores and school marks are summarized in Table 2. Since all variables are z-standardized (zero mean, one standard deviation) the differences in parental background are easily noticeable. There is at least one standard deviation difference between those whose fathers have only elementary education and those whose fathers graduated from tertiary education.

⁴ Results are robust to use of other kinds of definition for social class position, such as the higher score from mother's and father's education.

Table 2

Mean, standard deviation and number of cases of self-assessment and the most important ability measures in 8th grade, by parental background (every variable is standardized)

Parental background		Self-assessment (standardized)	Competence-scores (standardized)	School-marks (standardized)
Elementary school	mean	-0.45	-0.62	-0.42
	sd	0.87	0.81	0.94
	N	1979	1979	1979
Vocational school	mean	-0.13	-0.11	-0.09
	sd	0.95	0.87	0.97
	N	3827	3827	3827
High-school final exam	mean	0.28	0.34	0.24
	sd	0.97	0.95	0.96
	N	2189	2189	2189
Tertiary education	mean	0.74	0.85	0.62
	sd	0.88	1.01	0.89
	N	1055	1055	1055
Total	mean	0.00	0.00	0.00
	sd	1.00	1.00	1.00
	N	9050	9050	9050

IV. ENDOGENEITY ISSUES

In an ideal situation, self-assessment should be measured before the educational transition. In our case, however, self-assessment is retrospective. It is asked at the beginning of the 9th grade, but it refers to the 8th grade. Since the wording of the self-assessment measure (SA) refers to 8th grade performance, if it were not asked retrospectively, the causality assumption would hold – simply because of the temporal ordering between cause and effect.

Let us assume the following equation (Eq.1):

$$y = \alpha + \beta_1 \times SA + \beta_2 \times A + \mu + \varepsilon \quad (\text{Eq.1})$$

where y is the dependent variable, which is educational transition; SA is self-assessment; A is ability, μ is time-invariant unobserved characteristics; and ε is a time-variant individual error term, while α and β are the parameters in question. Because of the retrospective nature of the self-assessment measure, we assume:

$$\text{cov}(SA, \varepsilon) \neq 0 \quad (\text{Eq.2})$$

Reverse causality (Eq.2) might emerge because something shocked individual perceptions, and under the influence of this shock pupils' estimations of their own ability are biased. This shock is captured in ε (in Eq.1) and therefore Eq.2 holds. If we could identify this

shock (which will be our approach), reverse causality could be regarded as an omitted variable problem.

Educational transition (y) can only be made after elementary education is completed (after the 8th grade, in this case). Application to secondary education, however, occurred before NABC or HLCS, and even before the admission tests to any secondary school (see Figure A1 in the Appendix). Note that pupils enter secondary education on the basis of the order of preference they indicate on their application, and on the basis of their results in the admission test. Usually pupils rank better schools higher on their order of preference. It should also be noted that usually more competitive schools prescribe an ability test, and schools without a good reputation cannot select pupils. Hence, while pupils' order of preference for secondary schools is exogenous, self-assessment could be endogenous, since it is measured after the application procedure to secondary school. It is very reasonable to assume that those who do not get into the school that is first on their preference list downgraded their 8th grade performance retrospectively. This kind of systematic shock in self-assessment is more likely to occur among those who perform relatively well, since they apply to better schools with admission tests, while those with relatively weak performance get into secondary education anyway.⁵ Therefore a dummy variable is included to control for whether somebody gained a place at their first-choice secondary school.

Another important issue in the identification of the shock which might bias our self-assessment measure is that those who were admitted to a competitive secondary school could upgrade their self-assessment retrospectively; and the same is true in the opposite direction for those who were admitted to a weak secondary school. We computed a school-quality measure for elementary schools, taking the school average of 8th grade competence-score PCA. The quality of the secondary school was estimated using NABC data on 10th graders in 2006. Here again school averages were calculated, and these means were merged with the HLCS data set using school ID as the key variable. In the second step, both school-quality measures were divided into 100 equal categories and we took the difference of secondary and (minus) elementary school quality measure, as a proxy for the change in school quality.

A second possible type of endogeneity might be caused by omitted variables. There are two possible types of omitted variables: those which have time-variant characteristics (these variables are captured in ε and cause problems as indicated in Eq.2), and those which are time-invariant (like type of personality, motivation), which are captured in μ in Eq.1. Even in an ideal situation (which is clearly not the case) when there are several measures of self-assessment and ability, one is not able entirely to eliminate all the unobserved individual

⁵ For the particular cohort which is in the scope of this analysis, compulsory education lasted until the age of 18. That means that those who completed elementary education ought to have spent at least a couple of years in secondary education, depending on their age. There is no way of quitting the educational system.

characteristics using first-difference or fixed effects models, since the dependent variable (educational transition) does not have a time-variant component. Therefore we assumed Eq.3:

$$\text{cov}(SA, \mu) \neq 0 \quad (\text{Eq.3})$$

In terms of individual characteristics, which might correlate with ability, there is no way to distinguish ε from μ . We assumed that the bias of non-observed ability is distributed equally, at least according to social status. Note that to some extent school marks could also capture latent ability not measured by competence scores.

Another issue involves distinguishing self-assessment from psychological measures. These measures might be captured in μ since they are believed to be time invariant. HLCS contains information about Rosenberg's self-esteem, Rotter's locus of control scale and Harter's social competence scores. Rotter's (1966) locus of control scale measures the degree of control that individuals have over their lives. Rosenberg's (1965) self-esteem estimates the overall evaluation of one's worth or value. Harter's (1982) social competence scores provide information on whether somebody feels they are an important member of the school class. Moreover, a depression scale was constructed from questions about anxiety and suicidal thoughts. The psychological variables applied are not appropriate to control for every individual-level characteristic (achievement orientation, preferences for education, occupational aspirations), which obviously correlate both with educational choices and with self-assessment, but one can assume that these individual features correlate highly with them.

The third possible type of endogeneity would be the unobserved school-level heterogeneity (captured in μ), which might also bias the estimation of self-assessment. Since rating of one's own performance is always relative (because it is based on social comparison), endogeneity might occur if there is a sorting of students across schools. The heterogeneity of schools in Hungary is considered by other researchers to be quite remarkable (Horn, 2013). Moreover it is easy to assume that pupils/parents select schools in order to maximize the peer effect, or that motivated parents send their offspring to schools with high teacher quality. The same issue emerges if teachers who prefer personality-based education select schools based on their pedagogical programme, so that not just pupils but also teachers are not randomly distributed among schools. Even though HLCS is not a classroom survey, classroom-level information can be merged with it from NABC, in order to control for school fixed effects.

V. EMPIRICAL MODELS

First, we test whether the perceptions of their own ability are identical for pupils with different parental backgrounds. A linear probability model is employed, where self-assessment is explained by parental background, controlling for ability. Eq.4 shows the model estimated, where SA stands for self-assessment, PB for parental background, and A is a vector for ability containing school marks and competence scores. The competence score appears in the class average and individual deviation from this average. Class average would show the impact of school performance if individual deviations are 0, or if somebody performs at an average level for his class. Because of the retrospective nature of the self-assessment, it was necessary to include vector T , containing three variables. The first is the difference in school quality between secondary and elementary school; the second is a dummy variable showing whether missing cases were set to 0 (no difference between elementary and secondary school); and the third is whether the respondent was admitted to the first-choice school in secondary education. P is the vector of psychological variables, containing psychological traits like locus of control, social competence, self-esteem and inclination to depression. C is a vector representing individual controls like gender, year of birth, number of siblings, birth order and fixed effects, whether the respondent needs special education or is Roma, plus type of settlement and county; ε is an individual error term; the β -s are the vectors of ordinary least squares coefficients; and α is the constant in the equation. The results appear in Table 3. Throughout the analysis we are most interested in β_1 (the impact of parental background) and β_3 (the difference in the impact of ability by parental background).

$$SA = \alpha + \beta_1 \times PB + \beta_2 \times A + \beta_3 \times P + \beta_4 \times T + \beta_5 \times C + \beta_6 \times (PB \times A) + \varepsilon \quad (\text{Eq.4})$$

The second research question is about educational transitions, and the role of self-assessment is the focus of analysis. Three different dependent variables are employed (descriptive statistics are available in Table 1). In case of the transition from elementary to secondary education, the dependent variable is those who were admitted to secondary school (secondary general and secondary vocational) versus those at vocational school. In a second set of models, we analyse the difference between secondary general and secondary vocational schools. Lastly, the transition to state-financed tertiary education is analysed. In this set of models, the population contains those who completed secondary education (secondary general or secondary vocational school) within five years of commencing it. Among the right-hand variables appears self-assessment (SA), ability (A), parental background (PB), information about the admission test (T), psychological controls (P), and other individual-

level control variables (C). In case of entry to tertiary education, an additional variable appears in the regression, indicating the year when pupils graduated from secondary school (U). The results appear in Table 4; they are first estimated using a linear probability model (Eq.5) and then with logit (Eq.6). In Eq.6, self-assessment appears in its original form, and also as the difference between it and the competence scores. Because both variables are z-standardized, we simply took the difference (self-assessment minus competence scores). Underestimated ability was established if the difference was greater than -1; overestimated ability if the difference was greater than 1; and relatively unbiased self-estimation if the difference fell between 1 and -1.

$$Y = \alpha + \beta_1 \times SA + \beta_2 \times PB + \beta_3 \times A + \beta_4 \times P + \beta_5 \times T + \beta_6 \times C [+ \beta_7 \times U] + \varepsilon \quad (\text{Eq.5})$$

$$P(y = 1) = \frac{\exp(\alpha + \beta_1 \times SA + \beta_2 \times PB + \beta_3 \times A + \beta_4 \times P + \beta_5 \times T + \beta_6 \times C [+ \beta_7 \times U])}{1 + \exp(\alpha + \beta_1 \times SA + \beta_2 \times PB + \beta_3 \times A + \beta_4 \times P + \beta_5 \times T + \beta_6 \times C [+ \beta_7 \times U])} \quad (\text{Eq.6})$$

Following the logic of Falch and Strom (2011) the parameter estimation of self-assessment might be biased because of unobserved school-level heterogeneity, resulting from the fact that pupils (and teachers) are not randomly allocated to schools; also the quality of the school could influence self-assessment (in more competitive schools, school marks might be worse, and therefore self-assessment might suffer a downward bias). That said, school fixed effects are included in Eq.5. In Eq.7, S stands for school ID, and these models are fitted both with formal elementary and with current secondary school fixed effects (Table A4 in the Appendix). Note that including fixed effects in the logit model would be less effective, since every school where there is no variance in the dependent variable would fall out (again HLCS contains only samples from school class, and schools with few individual observations could easily drop out).

$$Y = \alpha + \beta_1 \times SA + \beta_2 \times PB + \beta_3 \times A + \beta_4 \times P + \beta_5 \times T + \beta_6 \times C [+ \beta_7 \times U] + d_1 \times S_1 \dots + d_n \times S_n + \varepsilon \quad (\text{Eq.7})$$

In the last section of the empirical analysis, we analyse the impact of self-assessment according to social status. In this section, two social-status groups are distinguished: low (parent's highest school qualification is vocational) and high (parent's highest school qualification is at least the high-school final exam).⁶ Because, in contrast to linear models, interpreting average marginal effects after logit is complicated (Ai and Norton, 2003; Norton, Wang and Ai, 2004; Cornelißen and Sonderhof, 2009; Buis, 2010), we estimated Eq.6 separately for the two social-status groups (Table A5 in the Appendix), and we performed

⁶ The for combining two categories is, as Holm and Jæger (2008) showed, in many cases pupils are only encouraged to study until they reach the educational level of their parent. The high-school final exam seems to be a dividing line. Since compulsory education lasts until 18, fathers without a high-school final exam might suggest that their children choose vocational school.

Blinder–Oaxaca-type decomposition (Table 5) for non-linear models (Jann, 2008; Powers, Yoshioka and Yun, 2011).

VI. RESULTS

VI.1. THE DETERMINANTS OF SELF-ASSESSMENT

In Table 3, the differences in self-assessment are analysed (Eq.4 is estimated). As one might expect, parental background is a powerful predictor of how someone estimates his own talent. Pupils from low-status families underestimate their abilities, compared to their peers in higher-status families (Model 1 in Table 3). The majority of observed differences in self-assessment, however, could be attributed to the class differences in ability. Once school marks and competence scores are controlled for (Model 2), differences in self-assessment according to parental background decrease sharply.

Since in Model 2 both school grades and competence scores (a standardized measure for school performance) are controlled for, and since both measures could be regarded as a proxy for ability, a possible interpretation of school marks would be feedback by teachers about school performance/behaviour at a given level of ability (competence scores). In this respect, it is noteworthy that the same unit change in school grade increases self-assessment by nearly twice as much as individual school performance (competence scores) measured by a standardized test. This result is supported by Model 3, where competence scores and the difference between school marks and (minus) competence scores appear in the regression. Self-assessment increases by nearly half a standard deviation (0.471) if the same level of competence score is rewarded with better school marks.

The findings could be interpreted as indicating that it is a teacher's responsibility to encourage pupils with better school marks. On the other hand, the result could be read from the perspective of the 'big fish, little pond' effect (Marsh and Hau, 2003; Marsh and Yeung, 1998; Marsh et al., 2008), where low (!) school quality (assessed by class average performance) could increase self-assessment in the case of outstanding individual school performance (negative class average, positive individual effect). Note that the results from Model 2 show that both class average competence scores and individual deviation from the class average increase self-assessment. In other words, even if someone is in a competitive school class, his self-assessment would increase. At first sight this contradicts the 'big fish, little pond' hypothesis. However, one should consider that in our models class average competence scores and the individual deviation from the class average are employed, and not the competence scores and class average scores, as Marsh suggested. The interpretation of

class average in our models refers to the case if individual deviations are 0, in other words at the average performance of the class (not in the sample).

Model 4 contains psychological traits that are in standard use. Higher social competences and higher self-esteem translated to higher self-assessment, while inclination to depression has a negative effect on self-perception. In subsequent models, external controls (measured using the Rotter scale) become significant at a borderline level, meaning that those who believe that external factors shape their lives (rather than their own actions and efforts – internal control) have lower self-assessment. Regarding the variables capturing the shock in self-assessment (Model 5), one can establish a positive effect for school quality. If someone attends a secondary school that is more competitive than their elementary school, a positive bias in self-assessment is more likely. It is also remarkable that the missing school-level information (manually replaced with 0) does not have a direct effect on self-assessment, and nor does success in the admissions test.

Model 6 contains interaction effects in the full model. It turns out that on average the impact of individual competence scores does not vary by parental background. However, using predictions from Model 6, one should find significant class differences in the perception of one's own abilities at the mean level of competence. This highlights the two facts that it is particularly difficult to assess mean-level performance, and that the offspring of higher-status families have an advantage, since they tend to assess the same level of competence higher than do their low-status peers.

Table 3

Explaining self-assessment, OLS coefficients with standard errors in parentheses

Number of model	(1)	(2)	(3)	(4)	(5)	(6)
Estimated equation	Eq.3					
Dependent variable	Self-assessment	Self-assessment	Self-assessment	Self-assessment	Self-assessment	Self-assessment
Parent's highest school qualification						
<i>Elementary</i>	-0.520*** (0.036)	-0.074** (0.030)	-0.070** (0.030)	-0.065** (0.029)	-0.062** (0.029)	-0.067** (0.030)
<i>Vocational school</i>	-0.266*** (0.028)	-0.035 (0.023)	-0.033 (0.023)	-0.040* (0.023)	-0.037 (0.023)	-0.039* (0.023)
<i>High-school final exam</i>	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>Tertiary</i>	0.374*** (0.035)	0.075*** (0.028)	0.073*** (0.028)	0.072*** (0.028)	0.068** (0.028)	0.065** (0.031)
School marks, PCA 8th grade		0.468*** (0.012)		0.444*** (0.012)	0.423*** (0.013)	0.423*** (0.013)
Class average competence scores, 8th grade		0.201*** (0.016)		0.193*** (0.016)	0.219*** (0.017)	0.218*** (0.017)
Individual competence scores, deviation from class average, 8th grade		0.234*** (0.014)		0.224*** (0.014)	0.216*** (0.014)	0.212*** (0.023)
× <i>Elementary</i>						-0.031 (0.035)
× <i>Vocational school</i>						0.015 (0.028)
× <i>High-school final exam</i>						0.009
× <i>Tertiary</i>						(0.032) -0.031
Competence scores, PCA, 8th grade			0.691*** (0.011)			
Diff. between school marks (PCA) and competence scores (PCA)			0.471*** (0.012)			
Rotter's external control				-0.066 (0.041)	-0.069* (0.041)	-0.069* (0.041)
Harter's social competence scores				0.099*** (0.019)	0.100*** (0.019)	0.100*** (0.019)
Rosenberg's self-esteem scale				0.199*** (0.022)	0.199*** (0.022)	0.199*** (0.022)
Depression scale				-0.110*** (0.041)	-0.109*** (0.041)	-0.109*** (0.041)
Admitted to first choice					0.012 (0.020)	0.012 (0.020)
Quality of upper-secondary school compared to elementary school					0.002*** (0.000)	0.002*** (0.000)
The difference in school quality is set to 0					0.042 (0.028)	0.042 (0.028)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-242.530*** (35.295)	6.576 (28.610)	7.526 (28.633)	13.855 (28.166)	16.419 (28.217)	15.141 (28.289)
Observations	9,050	9,050	9,050	9,050	9,050	9,050

R-squared	0.112	0.420	0.419	0.437	0.438	0.439
F-stat	42.25***	202.5***	208.8***	196.7***	183.2***	173.2***

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Other controls (in vector C): male; year of birth; number of siblings; birth order; respondent needs special education; respondent is Roma; type of settlement; county

VI.2. EDUCATIONAL CHOICES AND SELF-ASSESSMENT

Table 4 summarizes the effect of self-assessment on educational decisions (Eq.5 and Eq.6 are estimated). Because there are three different types of dependent variables, three panels (A, B and C) appear in the table. Each block contains three models – linear probability model, logit and another specification of the logit model – where the impact of self-assessment is categorized. The impact of self-assessment is significant and positive for every model examined. It is worthy of note that the impact of self-assessment is higher if the choice between educational scenarios is more competitive. While one standard deviation increase in self-assessment increases the probability of someone choosing a secondary school (a school type that offers a high-school final exam) by some 1.5 percentage points, the same amount of increase translates to something like a 4.5 percentage point increase in probability if the choice is between a secondary general school (*gimnázium*) and a secondary vocational school (*szakközépiskola*). We also found a larger (approximately 4 percentage points) impact of self-assessment when it comes to opting for tertiary education. The results also show that overestimated ability has an overwhelmingly positive effect, while underestimated ability is only penalized if it comes to a choice between secondary general and secondary vocational school. This means that, regardless of the definition of self-assessment (absolute or relative), its impact is larger if pupils make quality-based horizontal decisions within the secondary system.

Parental background provides a stable effect on educational transitions. Compared to those whose fathers passed a high-school final exam, pupils from lower-status families have less probability of choosing a knowledge-intensive educational scenario in Panels A and B, while those from higher-status families have a greater chance (with the exception of Model 1). The difference between offspring with vocationally educated fathers and families with a household head who has passed a high-school final exam is not significant in Panel C.

Ability also has a positive effect in educational transitions. Of the ability measures, class average competence scores seem to have the greatest impact, followed by school marks and individual school performance. These results are stable, even after the introduction of elementary school fixed effects (Panel A in Table A4 in the Appendix). In other words, the results make it clear that, in the decision to opt for a more competitive educational scenario, school effects (class average competence scores and school marks as a proxy for feedback

about individual performance in school) are more important than individual performance (the individual deviation from the class average in competence scores). It is also remarkable that psychological traits do not have a direct effect on educational transitions. However, variables capturing systematic bias in self-assessment as a retrospective measure do maintain a positive effect. Apparently this is a result of the fact that higher-ranking school types (secondary general school) are usually of better quality than vocational schools. To be on the safe side, we included secondary school fixed effects (Eq.7) in the regression (Panel B in Table A4 in the Appendix), in order to capture every systematic shock that might arise in self-assessment. Applying secondary school fixed effects leads to a loss in sample size of approximately 200–400 observations. The impact of self-assessment is clearly lower, but is positive and statistically significant at the same level. The decrease in the parameters of ability and competence scores could be explained by the selection of pupils that occurs when pupils move from elementary to secondary education. Finally in models explaining the choice to opt for tertiary education, those who graduated in 2011 (compared to 2010) have a smaller chance of being admitted to tertiary education. This is very likely a consequence of the fact that those who graduated earlier could sit the admission test repeatedly.

Table 4

The explanation of educational choice, regression results

	Panel A			Panel B			Panel C		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Number of model	8th grader in 2005/06			8th grader in 2005/06			Finished secondary school within 5 years		
Population	Secondary school (1) versus vocational school (0)			Sec. general school (1) versus sec. voc. school (0)			Admitted to state-financed tertiary education		
Dependent variable	Secondary school (1) versus vocational school (0)			Sec. general school (1) versus sec. voc. school (0)			Admitted to state-financed tertiary education		
Type of model	Lin. prob. model	Logit, av. marg. eff.		Lin. prob. model	Logit, av. marg. eff.		Lin. prob. model	Logit, av. marg. eff.	
Estimated equation	Eq.5	Eq.6	Eq.6	Eq.5	Eq.6	Eq.6	Eq.5	Eq.6	Eq.6
Self-assessment	0.015*** (0.005)	0.017*** (0.004)		0.043*** (0.008)	0.044*** (0.008)		0.039*** (0.010)	0.036*** (0.011)	
Underestimated abilities (diff.>-1)			-0.015 (0.010)			-0.054*** (0.016)			-0.021 (0.020)
Relatively unbiased			Ref.			Ref.			Ref.
Overestimated abilities (diff.<1)			0.020** (0.009)			0.062*** (0.019)			0.080*** (0.029)
Parent's school qual.									
<i>Elementary</i>	-0.113*** (0.014)	-0.073*** (0.012)	-0.074*** (0.012)	-0.059*** (0.021)	-0.065*** (0.022)	-0.065*** (0.022)	-0.055** (0.026)	-0.071** (0.030)	-0.071** (0.030)
<i>Vocational</i>	-0.042*** (0.009)	-0.044*** (0.009)	-0.045*** (0.009)	-0.039*** (0.015)	-0.038*** (0.014)	-0.038*** (0.014)	-0.027 (0.018)	-0.027 (0.018)	-0.027 (0.018)
<i>High school</i>	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>Tertiary</i>	-0.027*** (0.009)	0.045*** (0.015)	0.045*** (0.015)	0.159*** (0.018)	0.151*** (0.018)	0.152*** (0.018)	0.106*** (0.023)	0.087*** (0.022)	0.088*** (0.022)
School marks	0.105*** (0.006)	0.096*** (0.005)	0.100*** (0.005)	0.101*** (0.010)	0.091*** (0.009)	0.098*** (0.009)	0.100*** (0.012)	0.109*** (0.013)	0.116*** (0.013)
Class average competence scores, 8th grade	0.101*** (0.007)	0.134*** (0.007)	0.143*** (0.008)	0.143*** (0.012)	0.138*** (0.012)	0.170*** (0.012)	0.134*** (0.017)	0.123*** (0.016)	0.150*** (0.017)
Individual competence score deviation from class	0.038*** (0.006)	0.062*** (0.006)	0.072*** (0.006)	0.047*** (0.010)	0.038*** (0.010)	0.069*** (0.010)	0.104*** (0.012)	0.093*** (0.012)	0.117*** (0.013)
Rotter's external control	-0.021 (0.017)	-0.013 (0.015)	-0.014 (0.015)	-0.023 (0.027)	-0.021 (0.027)	-0.021 (0.027)	0.040 (0.034)	0.042 (0.035)	0.042 (0.035)
Social competence	0.003 (0.008)	-0.007 (0.007)	-0.006 (0.007)	0.013 (0.013)	0.012 (0.013)	0.014 (0.013)	-0.018 (0.016)	-0.014 (0.016)	-0.011 (0.016)
Self-esteem	0.011 (0.009)	0.015* (0.009)	0.016* (0.009)	-0.014 (0.015)	-0.013 (0.015)	-0.009 (0.015)	0.012 (0.019)	0.010 (0.019)	0.015 (0.019)

Depression scale	0.006 (0.018)	0.009 (0.015)	0.008 (0.015)	0.023 (0.028)	0.020 (0.028)	0.020 (0.028)	0.025 (0.035)	0.031 (0.037)	0.032 (0.037)
Admitted to first choice	-0.005 (0.009)	0.005 (0.008)	0.005 (0.008)	-0.033** (0.013)	-0.037*** (0.013)	-0.037*** (0.013)	0.018 (0.017)	0.013 (0.018)	0.013 (0.018)
Quality of sec. school	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Difference in school quality is 0	-0.020 (0.012)	-0.028*** (0.010)	-0.028*** (0.010)	0.131*** (0.021)	0.136*** (0.019)	0.136*** (0.019)	0.014 (0.027)	0.014 (0.026)	0.015 (0.026)
Graduated in 2011 (reference: year 2010)							-0.070*** (0.016)	-0.075*** (0.016)	-0.075*** (0.016)
Constant	-80.202*** (13.753)			9.924 (20.785)			-27.289 (28.624)		
Observations	9,050	9,050	9,050	6,316	6,316	6,316	3,905	3,905	3,905
R-squared	0.342	0.397	0.396	0.309	0.268	0.267	0.248	0.225	0.224
F-stat	128.8***			89.83***			34.02***		
p		.	.						
Log likelihood		-34168	-34222		-40760	-40846		-26234	-26269
chi2		1898***	1890***		1175***	1163***		671.3***	662.4***

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Other controls (in vector C): male; year of birth; number of siblings; birth order; respondent needs special education; respondent is Roma; type of settlement; county

Estimations from Eq.5 and Eq.6 could be biased because of unobserved mechanisms in selectivity. In analysis of the choice between secondary school and vocational school, the data are right censored, since the best-performing and most highly motivated pupils from high-status families are likely to have gone to 6- or 8-grade secondary schools, and hence they probably made an educational decision at age 10 or 12 (which means they are missing from the sample). This censoring could suggest a downward bias in means. Following the logic of Cameron and Heckman (1998), if pupils with high socioeconomic status have a better chance of choosing knowledge-intensive educational scenarios, then those children with low socioeconomic status must have an especially positive set of unobserved characteristics. The bias in self-assessment could be in the opposite direction in the case of a choice between secondary general and secondary vocational school, or in the case of admission to tertiary education. In these settings, the worst-performing, most poorly motivated pupils from low-status families are missing (since they went to vocational schools). Controlling for sample selection with the two-stage method proposed by Heckman (1979), the results seem to be stable.

VI.3. THE CONTRIBUTION OF SELF-ASSESSMENT TO TOTAL STATUS DIFFERENCES IN EDUCATIONAL DECISIONS

In previous sections it was shown that pupils with different parental backgrounds estimate the same level of ability differently (Figure 4), and that self-assessment contributes significantly to the decision to opt for more knowledge-intensive educational routes (Table 4). In this section our aim is to show the impact of self-assessment in the explanation of total status differences in educational decisions. Blinder–Oaxaca-type decomposition is performed on the data, where the grouping variable is low status (father with vocational education or below) or high status (father with at least high-school final exam). This type of analysis is practically equivalent to models with a full set of interactions.

The results are summarized in Table 5. There are three panels in the table, and each refers to a different logit model in Table 4 (Eq.6). The difference in outcome variables according to low- and high-status pupils appears in the row ‘Difference’. As Jann (2008) points out, these differences should be interpreted from the viewpoint of group B, which is the high-status group in this case. Compared to high-status pupils, low-status students are on average nearly 22 percentage points less likely to choose a secondary school (secondary general or secondary vocational) than a vocational school (Panel A). The same difference is 21 and 16 percentage points in Panels B and C, respectively. It is overwhelmingly differences in

characteristics (endowment effects) that are responsible for this finding. Endowment effects explain more than 80 per cent of total differences in Panel A, and approximately 65 per cent of differences in Panels B and C.

If high-status pupils had the same level of self-assessment as their low-status peers, the difference in the endowment effects would decrease (Columns 1, 4 and 7 in Table 5). This means, in other words, that low-status respondents have lower means in self-assessment. The drop in total status difference (the ratio of endowment effects in self-assessment and total status differences) would be some 5 percentage points (in Panel A and B) and some 7 percentage points (in Panel C) if the high-status group had the same mean in self-assessment as the low-status group. The results reveal that differences in self-assessment are important in the status differences of educational choices, and differences in the impact of self-assessment exist mainly because low-status pupils estimate their abilities lower.

The coefficient effect of self-assessment in Columns 2, 5 and 8 of Table 5 shows the consequences of the hypothetical case where high-status pupils are treated the same way as low-status pupils (practically using the same regression coefficient for high-status pupils that was estimated for their low-status peers). Status differences due to self-assessment will not change in Panels A and C (parameters are not significant), meaning that low-status pupils would not be discriminated against if they gave a high assessment of their abilities. However, if the choice is between secondary general and secondary vocational school (Panel B) status differences will increase (the coefficient is significant at a borderline level). The positive sign of this coefficient means that the impact of self-assessment is higher in the case of low-status respondents. Note that this choice is rather a quality-based, horizontal educational decision, since pupils in the higher class are pushed by their class position to choose the most competitive secondary track in order to enhance their chances of later going to university and thus of avoiding downward mobility. Consequently, subjective beliefs play a less-important role in the decision among higher-status pupils than among those with lower status. This finding is revealed as a result of logit regressions, where the same models are fitted separately for the two groups of pupils (Panel B in Table A5 in the Appendix). Interestingly, even though low-status pupils benefit from the impact of their self-assessment (coefficient effect), since on average they have lower self-assessment (endowment effect), this fact counterbalances the positive gain in the regression parameters.

Table 5

Blinder–Oaxaca type decomposition of educational choice between low-status (parent’s highest school qualification is vocational) and high-status (parent’s highest school qualification minimum high-school final exam) respondents

	Panel A			Panel B			Panel C		
Number of model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Ref. model in Table 4	(2)			(5)			(8)		
Population	8th grader in 2005/06			8th grader in 2005/06			Finished secondary school within 5 years		
Dependent variable	Secondary school (1) vs. vocational school (0)			Sec. general school (1) vs. sec. voc. school (0)			Admitted to state-financed tertiary education		
	Overall model			Overall model			Overall model		
Low status	0.689*** (0.007)			0.305*** (0.009)			0.243*** (0.011)		
High status	0.905*** (0.004)			0.514*** (0.009)			0.407*** (0.011)		
Difference	-0.216*** (0.008)			-0.209*** (0.013)			-0.164*** (0.016)		
Endowments	-0.179*** (0.009)			-0.141*** (0.010)			-0.106*** (0.011)		
Coefficients	-0.042*** (0.006)			-0.097*** (0.015)			-0.055*** (0.019)		
Interaction	0.005 (0.008)			0.029*** (0.011)			-0.003 (0.014)		
	Endowments	Coefficients	Interaction	Endowments	Coefficients	Interaction	Endowments	Coefficients	Interaction
Self-assessment	-0.012*** (0.004)	-0.002 (0.002)	0.001 (0.001)	-0.011** (0.005)	0.017* (0.009)	-0.018 (0.012)	-0.012*** (0.005)	-0.000 (0.012)	0.000 (0.001)
School marks	-0.047*** (0.006)	-0.001 (0.003)	0.000 (0.001)	-0.041*** (0.006)	-0.003 (0.014)	0.002 (0.012)	-0.033*** (0.006)	-0.002 (0.018)	0.000 (0.001)
Class average competence scores, 8th grade	-0.051*** (0.005)	-0.003 (0.002)	0.001 (0.001)	-0.059*** (0.007)	-0.005 (0.011)	0.006 (0.013)	-0.036*** (0.008)	0.032** (0.013)	-0.005 (0.016)
Individual competence scores deviation from class	-0.020*** (0.003)	-0.003** (0.002)	0.001 (0.001)	-0.012*** (0.003)	-0.012 (0.008)	0.009 (0.006)	-0.016*** (0.004)	0.001 (0.010)	-0.000 (0.001)
Rotter’s external control	0.000 (0.001)	-0.003 (0.004)	-0.000 (0.000)	-0.000 (0.000)	0.007 (0.018)	0.000 (0.001)	0.000 (0.000)	0.005 (0.019)	0.000 (0.000)
Social competence	0.000 (0.000)	-0.003 (0.020)	0.000 (0.000)	-0.001 (0.001)	-0.198** (0.087)	0.001 (0.001)	-0.000 (0.000)	-0.208** (0.095)	0.000 (0.000)
Self-esteem	-0.000 (0.001)	0.009 (0.017)	-0.000 (0.000)	0.002 (0.001)	0.093 (0.071)	-0.003 (0.002)	0.000 (0.001)	0.082 (0.076)	-0.000 (0.001)

Depression scale	-0.001 (0.001)	0.018 (0.016)	0.000 (0.000)	0.000 (0.001)	0.030 (0.073)	0.001 (0.002)	0.001 (0.001)	-0.018 (0.081)	-0.000 (0.000)
Admitted to first choice	-0.000 (0.000)	-0.007 (0.005)	0.000 (0.000)	0.001 (0.001)	-0.020 (0.022)	0.001 (0.001)	-0.000 (0.001)	0.003 (0.025)	-0.000 (0.000)
Quality of upper-sec. school	-0.007*** (0.002)	-0.000 (0.000)	0.000 (0.000)	-0.002 (0.003)	-0.000 (0.002)	0.000 (0.000)	0.001 (0.001)	0.005 (0.003)	0.000 (0.001)
Difference in school quality is 0	-0.001** (0.000)	0.002** (0.001)	0.000 (0.000)	0.001 (0.001)	-0.000 (0.003)	-0.000 (0.000)	0.000 (0.000)	-0.004 (0.004)	-0.000 (0.000)
Graduated in 2011 (reference: year 2010)							0.004** (0.002)	-0.005 (0.011)	0.000 (0.001)
Constant		-0.044 (10.072)			-16.691 (46.708)			-13.447 (52.745)	
Observations	9,050	9,050	9,050	6,316	6,316	6,316	3,905	3,905	3,905
Number of low status	5806	5806	5806	5806	3469	3469	3469	3469	1957
Number of high status	3244	3244	3244	3244	2847	2847	2847	2847	1948

Eq.6. is decomposed in this table.

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Other controls (in vector C): male; year of birth; number of siblings; birth order; respondent needs special education; respondent is Roma; type of settlement; county

VII. CONCLUSION AND DISCUSSION

The empirical results suggest considerable differences in self-assessment between social classes. It has also been established that self-assessment contributes significantly to the decision to choose a more knowledge-intensive educational route. One standard deviation gain in self-assessment contributes to a 1.5–4.5 percentage point increase in the likelihood of a more knowledge-intensive educational choice. The decomposition of status differences in educational choices showed that self-assessment would decrease initial status differences in educational decision by some 5–7 percentage points. Status differences in the impact of self-assessment mainly exist because higher-status pupils have higher self-assessment than their more disadvantaged peers. However, compared to their high-status peers, among pupils from low-status groups self-assessment has a higher impact when it comes to a choice between academic (*gimnázium*) or practically oriented (*szakközépiskola*) secondary school. These results suggest that a soft skill (such as recognizing one’s own abilities) can have a long-lasting impact on educational career. Our findings are consistent with those of Tolsma, Need and de Jong (2010), who found success probability a significant explanatory mechanism in participation in Dutch higher education. Similarly to that finding, we also found significant status differences even after controlling for self-assessment, which suggests that unexplained status differences cannot entirely be attributed to differences in self-assessment. However, contrary to Tolsma, Need and de Jong (2010), we found that the impact of self-assessment on educational decisions varies according to social class position, which underlines the fact that self-assessment is an important factor in status difference in educational choices, and opens up new questions about the origin of this difference.

Future research should therefore clarify the mechanisms in the family that contribute to the different levels of self-assessment according to parental background. Our knowledge is still limited as to how low/high-status pupils are treated in their families for the same level of school performance. At this point the results may be biased, since unobserved family-level heterogeneity is not covered (We only assumed that these differences are captured by the status variable.) However, the results are stable once unobserved school-level differences are accounted for (note that unobserved family factors and school-level factors should be highly correlated). We also have some limited means to deal with unobserved individual characteristics that can modify self-assessment. Even though we were able to control for some psychological variables, assuming that these measures capture time-invariant individual-level heterogeneity, the impact of self-assessment might be measured with

unobserved motivations, ambitions and preferences for an anticipated educational qualification, or even parental expectations.

The findings could have important policy implications. As previous research has pointed out, children's ability-related beliefs begin to decline at middle-school age (Eccles et al., 1989; Wigfield et al., 1991) partly because they have more realistic information about themselves, or because the school environment becomes more competitive around then (Stipek, 1996). The most important decisions about further education, however, are made precisely in those years. If self-assessment plays a crucial role in why talented low-status pupils are reluctant to choose knowledge-intensive educational routes, some policy initiative should help pupils towards realistic perceptions of their own talent. As the results in Table 3 indicated, self-assessment is much more dependent on school marks than on a standardized measure of competence scores. The results (not included in this paper) also show that, for the same level of competence, lower-status pupils receive lower school marks than their higher-status peers. Thus teachers should be much more supportive of lower-status pupils, since the feedback that these pupils receive in the form of school marks can have a negative effect on self-assessment, and low self-assessment contributes to suboptimal educational decisions.

LITERATURE

- Ai, C. and Norton, E.C. (2003). Interaction terms in logit and probit models. *Economics Letters*, 80, 123–129.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 122–147.
- Boudon, R. (1974). *Education, Opportunity and Social Inequality*. New York: Wiley-Interscience.
- Breen, R. and Goldthorpe, J.H. (1997). Explaining educational differentials: towards a formal rational action theory. *Rationality and Society*, 9(3), 275–305. doi:10.1177/104346397009003002
- Breen, R. and Yaish, M. (2006). Testing the Breen–Goldthorpe Model of educational decision making. In S.L. Morgan, D.B. Grusky and G.S. Fields (eds), *Mobility and Inequality: Frontiers of research from sociology and economics*. Stanford: Stanford University Press. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1002/cbdv.200490137/abstract>
- Buis, M.L. (2010). Stata tip 87: Interpretation of interactions in non-linear models. *The Stata Journal*, 10(2), 305–308.
- Cameron, S.V. and Heckman, J.J. (1998). Life cycle schooling and dynamic selection bias: Models and evidence for five cohorts of American males. *Journal of Political Economy*, 106(2), 262. doi:10.1086/250010
- Checchi, D. (2006). *The Economics of Education: Human capital, family background and inequality*. Cambridge: Cambridge University Press.
- Cornelißen, T. and Sonderhof, K. (2009). Partial effects in probit and logit models with a triple dummy variable interaction term. *Stata Journal*, 9(4), 571–583.
- Eccles, J.S., Wigfield, A., Flanagan, C.A., Miller, C., Reuman, D.A. and Yee, D. (1989). Self-concepts, domain values, and self-esteem: Relations and changes at early adolescence. *Journal of Personality*, 57(2), 283–310.
- Esser, H. (1999). *Soziologie. Spezielle Grundlagen*. Vol. 1: *Situationslogik und Handeln*. Frankfurt/New York: Campus Verlag. Retrieved from <http://home.arcor.de/sunflowersf/band1.pdf>
- Falch, T. and Strom, B. (2011). Schools, ability, and the socioeconomic gradient in education choices. *CESifo Working Paper*, No. 3313.
- Filippin, A. and Paccagnella, M. (2011). Family background, self-confidence and economic outcomes. *IZA Discussion Paper*, No. 6117, 1–25. Retrieved from <http://ftp.iza.org/dp6117.pdf>
- Goldthorpe, J.H. (1996). Class analysis and the reorientation of class theory: the case of persisting differentials in educational attainment. *British Journal of Sociology*, 61 Suppl 1(3), 311–335. doi:10.1111/j.1468-4446.2009.01248.x
- Harter, S. (1982). The perceived competence scale for children. *Child Development*, 53, 87–97.
- Hartlaub, V. and Schneider, T. (2012). *Educational Choice and Risk Aversion: How important is structural vs. individual risk aversion?* *SOEP Papers*, No. 433. Berlin.
- Heckman, J.J. (1979). Sample selection bias as a specification error. *Econometrica*, 47(1), 153–161. doi:10.2307/1912352

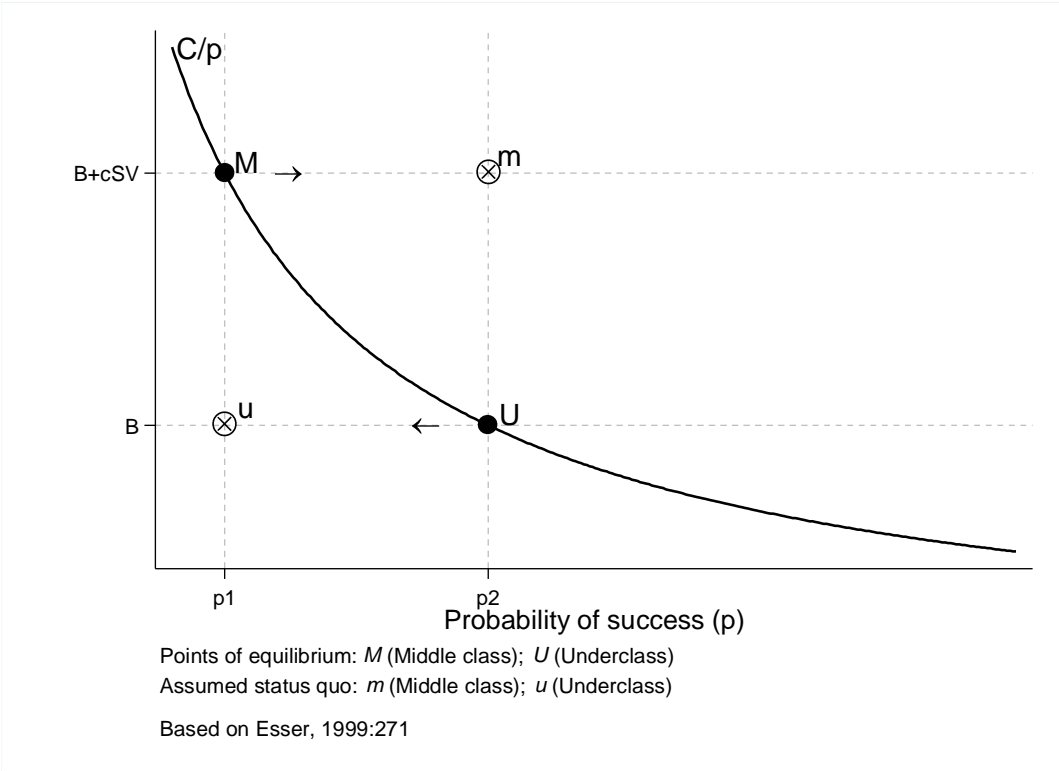
- Heckman, J.J., Stixrud, J. and Urzua, S. (2006). The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior. *NBER Working Paper Series*, No. 12006. Retrieved from <http://www.nber.org/papers/w12006>
- Himmler, O. and Koenig, T. (2012). Self-evaluations and performance: Evidence from adolescence. *Leibniz University Hannover Discussion Papers*, No. 502 (October 2012). Retrieved from <http://www3.wiwi.uni-hannover.de/Forschung/Diskussionspapiere/dp-507.pdf>
- Holm, A. and Jæger, M.M. (2008). Does relative risk aversion explain educational inequality? A dynamic choice approach. *Research in Social Stratification and Mobility*, 26(3), 199–219. doi:10.1016/j.rssm.2008.05.004
- Horn, D. (2013). Diverging performances: the detrimental effects of early educational selection on equality of opportunity in Hungary. *Research in Social Stratification and Mobility*, 32, 25–43. doi:<http://dx.doi.org/10.1016/j.rssm.2013.01.002>
- James, W. (1890). *The Principles of Psychology*, Vol. 1. London: Macmillan and Co. Retrieved from <https://ia700401.us.archive.org/24/items/principlesofpsyco1jameuoft/principlesofpsyco1jameuoft.pdf>
- Jann, B. (2008). A Stata implementation of the Blinder–Oaxaca decomposition. *ETH Zurich Sociology Working Papers*, No. 5.
- Marsh, H.W. and Hau, K.-T. (2003). Big-Fish–Little-Pond effect on academic self-concept: A cross-cultural (26-country) test of the negative effects of academically selective schools. *American Psychologist*, 58(5), 364–376. doi:10.1037/0003-066X.58.5.364
- Marsh, H.W. and Yeung, A.S. (1998). Longitudinal structural equation models of academic self-concept and achievement: Gender differences in the development of math and English constructs. *American Educational Research Journal*, 35(4), 705–738. doi:10.3102/00028312035004705
- Marsh, H.W., Seaton, M., Trautwein, U., Lüdtke, O., Hau, K.T., O’Mara, A.J. and Craven, R.G. (2008). The big-fish–little-pond-effect stands up to critical scrutiny: Implications for theory, methodology, and future research. *Educational Psychology Review*, 20(3), 319–350. doi:10.1007/s10648-008-9075-6
- Murphy, J. (1981). Class inequality in education: Two justifications, one evaluation but no hard evidence. *British Journal of Sociology*, 32(2), 182–201. doi:10.2307/589445
- Need, A. and Jong, U. De. (2000). Educational Differentials in the Netherlands. *Rationality and Society*, 13(1), 71–98.
- Norton, E.C., Wang, H. and Ai, C. (2004). Computing interaction effects and standard errors in logit and probit models. *Stata Journal*, 4(2), 154–167.
- Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, 66(4), 543–578. doi:10.3102/00346543066004543
- Powers, D.A., Yoshioka, H. and Yun, M.-S. (2011). mvdcmp: multivariate decomposition for nonlinear response models. *Stata Journal*, 11(4), 556–576.
- Róbert, P. (1986). *Származás és mobilitás (Rétegződés-modell vizsgálat VII.)*. Budapest: Társadalomtudományi Intézet.
- Rosenberg, M. (1965). *Society an the Adolescent Self-Image*. Princeton: Princeton University Press.
- Rotter, J. (1966). Generalized expectancies for internal versus external control of reinforcements. *Psychological Monographs*, 80(1), 1–28.
- Schunk, D.H. (1983). Ability versus effort attributional feedback: Differential effects on self-efficacy and achievement. *Journal of Educational Psychology*, 75(6), 848–856.

- Schunk, D.H. (1985). Self-efficacy and classroom learning. *Psychology in the Schools*, 22(2), 208–223.
- Sjögren, A. and Sällström, S. (2004). Trapped , delayed and handicapped. *Perception*, 613.
- Stipek, D.J. (1996). Motivation and instruction. In D.C. Berliner and R.C. Calfee (eds), *Handbook of Educational Psychology*. New York: Macmillan.
- Stocké, V. (2007). Explaining educational decision and effects of families' social class position: An empirical test of the Breen Goldthorpe Model of educational attainment. *European Sociological Review*, 23(4), 505–519. doi:10.1093/esr/jcm014
- Stocké, V., Blossfeld, H.-P., Hoenig, K. and Sixt, M. (2011). Social inequality and educational decisions in the life course. *Zeitschrift für Erziehungswissenschaft*, 14(S2), 103–119. doi:10.1007/s11618-011-0193-4
- Sullivan, A. (2006). Students as rational decision-makers: the question of beliefs and attitudes. *London Review of Education*, 4(3), 271–290. doi:10.1080/14748460601043965
- Tolsma, J., Need, A. and de Jong, U. (2010). Explaining participation differentials in Dutch higher education: the impact of subjective success probabilities on level choice and field choice. *European Sociological Review*, 26(2), 235–252. doi:10.1093/esr/jcp061
- Van de Werfhorst, H.G. and Hofstede, S. (2007). Cultural capital or relative risk aversion? Two mechanisms for educational inequality compared. *British Journal of Sociology*, 58(3), 391–415. doi:10.1111/j.1468-4446.2007.00157.x
- Wigfield, A. and Eccles, J.S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology*, 25(1), 68–81. doi:10.1006/ceps.1999.1015
- Wigfield, A., Eccles, J.S., Mac Iver, D., Reuman, D.A. and Midgley, C. (1991). Transitions at early adolescence: Changes in children's domain-specific self-perceptions and general self-esteem across the transition to junior high school. *Developmental Psychology*, 27(4), 552–565.
- Zimmerman, B.J. (2000). Self-efficacy: an essential motive to learn. *Contemporary Educational Psychology*, 25(1), 82–91. doi:10.1006/ceps.1999.1016

FIGURES

Figure 1

The association between educational motivation and probability of success – points of equilibrium and perceived deviation from it, by parental background



FIGURES IN APPENDIX

Figure A1

The waves of HLCS and some important events during the time represented

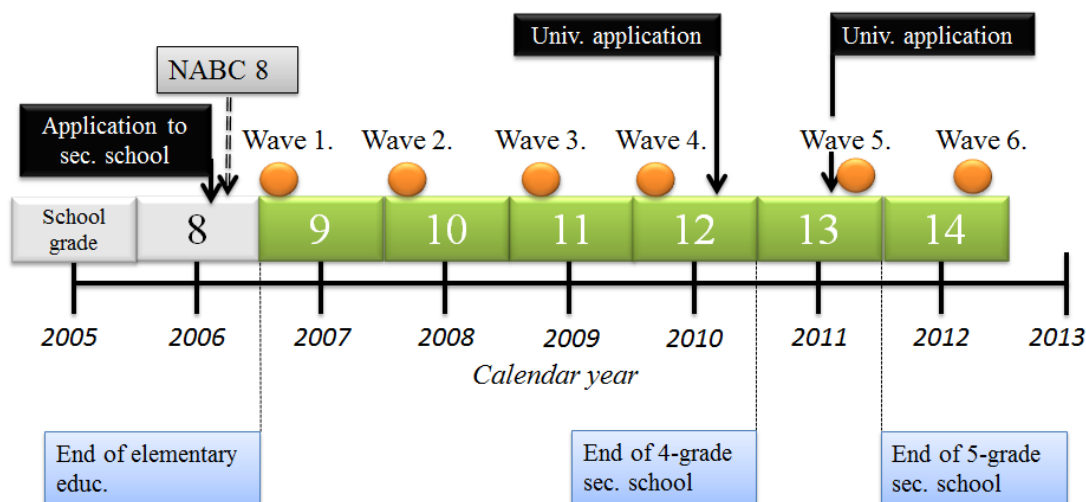
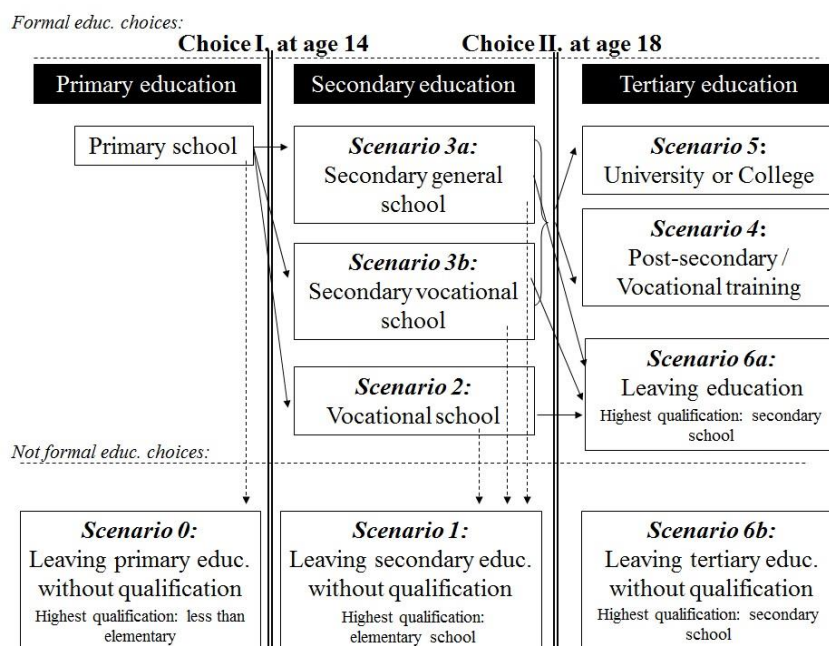


Figure A2

Educational choices and scenarios in Hungary



TABLES

Table 1

Mean, standard deviation and number of cases of the three dependent variables in analysis, by parental background

Parental background		Dependent variables used in the analysis		
		Admitted to secondary school/vocational school	Admitted to secondary general school/secondary vocational school	Admitted to state-financed tertiary education training
Elementary school	mean	45.63%	18.72%	12.53%
	sd	49.82%	39.03%	33.15%
	N	1979	903	391
Vocational school	mean	67.05%	27.71%	21.52%
	sd	47.01%	44.76%	41.11%
	N	3827	2566	1566
High-school final exam	mean	84.70%	39.91%	32.06%
	sd	36.01%	48.99%	46.69%
	N	2189	1854	1235
Tertiary education	mean	94.12%	66.87%	52.03%
	sd	23.53%	47.09%	49.99%
	N	1055	993	713
Total	mean	69.79%	36.16%	29.53%
	sd	45.92%	48.05%	45.62%
	N	9050	6316	3905

Table 2

Mean, standard deviation and number of cases of self-assessment and the most important ability measures in 8th grade, by parental background (every variable is standardized)

Parental background		Self-assessment (standardized)	Competence-scores (standardized)	School-marks (standardized)
Elementary school	mean	-0.45	-0.62	-0.42
	sd	0.87	0.81	0.94
	N	1979	1979	1979
Vocational school	mean	-0.13	-0.11	-0.09
	sd	0.95	0.87	0.97
	N	3827	3827	3827
High-school final exam	mean	0.28	0.34	0.24
	sd	0.97	0.95	0.96
	N	2189	2189	2189
Tertiary education	mean	0.74	0.85	0.62
	sd	0.88	1.01	0.89
	N	1055	1055	1055
Total	mean	0.00	0.00	0.00
	sd	1.00	1.00	1.00
	N	9050	9050	9050

Table 3

Explaining self-assessment, OLS coefficients with standard errors in parentheses

Number of model	(1)	(2)	(3)	(4)	(5)	(6)
Estimated equation						Eq.3
Dependent variable	Self-assessment	Self-assessment	Self-assessment	Self-assessment	Self-assessment	Self-assessment
Parent's highest school qualification						
<i>Elementary</i>	-0.520*** (0.036)	-0.074** (0.030)	-0.070** (0.030)	-0.065** (0.029)	-0.062** (0.029)	-0.067** (0.030)
<i>Vocational school</i>	-0.266*** (0.028)	-0.035 (0.023)	-0.033 (0.023)	-0.040* (0.023)	-0.037 (0.023)	-0.039* (0.023)
<i>High-school final exam</i>	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>Tertiary</i>	0.374*** (0.035)	0.075*** (0.028)	0.073*** (0.028)	0.072*** (0.028)	0.068** (0.028)	0.065** (0.031)
School marks, PCA 8th grade		0.468*** (0.012)		0.444*** (0.012)	0.423*** (0.013)	0.423*** (0.013)
Class average competence scores, 8th grade		0.201*** (0.016)		0.193*** (0.016)	0.219*** (0.017)	0.218*** (0.017)
Individual competence scores, deviation from class average, 8th grade		0.234*** (0.014)		0.224*** (0.014)	0.216*** (0.014)	0.212*** (0.023)
× <i>Elementary</i>						-0.031 (0.035)
× <i>Vocational school</i>						0.015 (0.028)
× <i>High-school final exam</i>						0.009
× <i>Tertiary</i>						(0.032) -0.031
Competence scores, PCA, 8th grade			0.691*** (0.011)			
Diff. between school marks (PCA) and competence scores (PCA)			0.471*** (0.012)			
Rotter's external control				-0.066 (0.041)	-0.069* (0.041)	-0.069* (0.041)
Harter's social competence scores				0.099*** (0.019)	0.100*** (0.019)	0.100*** (0.019)
Rosenberg's self-esteem scale				0.199*** (0.022)	0.199*** (0.022)	0.199*** (0.022)
Depression scale				-0.110*** (0.041)	-0.109*** (0.041)	-0.109*** (0.041)
Admitted to first choice					0.012 (0.020)	0.012 (0.020)
Quality of upper-secondary school compared to elementary school					0.002*** (0.000)	0.002*** (0.000)
The difference in school quality is set to 0					0.042 (0.028)	0.042 (0.028)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-242.530*** (35.295)	6.576 (28.610)	7.526 (28.633)	13.855 (28.166)	16.419 (28.217)	15.141 (28.289)
Observations	9,050	9,050	9,050	9,050	9,050	9,050
R-squared	0.112	0.420	0.419	0.437	0.438	0.439
F-stat	42.25***	202.5***	208.8***	196.7***	183.2***	173.2***

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Other controls (in vector C): male; year of birth; number of siblings; birth order; respondent needs
special education; respondent is Roma; type of settlement; county

Table 4

The explanation of educational choice, regression results

	Panel A			Panel B			Panel C		
Number of model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Population	8th grader in 2005/06			8th grader in 2005/06			Finished secondary school within 5 years		
Dependent variable	Secondary school (1) versus vocational school (0)			Sec. general school (1) versus sec. voc. school (0)			Admitted to state-financed tertiary education		
Type of model	Lin. prob. model		Logit, av. marg. eff.	Lin. prob. model		Logit, av. marg. eff.	Lin. prob. model		Logit, av. marg. eff.
Estimated equation	Eq.5	Eq.6	Eq.6	Eq.5	Eq.6	Eq.6	Eq.5	Eq.6	Eq.6
Self-assessment	0.015*** (0.005)	0.017*** (0.004)		0.043*** (0.008)	0.044*** (0.008)		0.039*** (0.010)	0.036*** (0.011)	
Underestimated abilities (diff.>-1)			-0.015 (0.010)			-0.054*** (0.016)			-0.021 (0.020)
Relatively unbiased			Ref.			Ref.			Ref.
Overestimated abilities (diff.<1)			0.020** (0.009)			0.062*** (0.019)			0.080*** (0.029)
Parent's school qual.									
<i>Elementary</i>	-0.113*** (0.014)	-0.073*** (0.012)	-0.074*** (0.012)	-0.059*** (0.021)	-0.065*** (0.022)	-0.065*** (0.022)	-0.055** (0.026)	-0.071** (0.030)	-0.071** (0.030)
<i>Vocational</i>	-0.042*** (0.009)	-0.044*** (0.009)	-0.045*** (0.009)	-0.039*** (0.015)	-0.038*** (0.014)	-0.038*** (0.014)	-0.027 (0.018)	-0.027 (0.018)	-0.027 (0.018)
<i>High school</i>	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>Tertiary</i>	-0.027*** (0.009)	0.045*** (0.015)	0.045*** (0.015)	0.159*** (0.018)	0.151*** (0.018)	0.152*** (0.018)	0.106*** (0.023)	0.087*** (0.022)	0.088*** (0.022)
School marks	0.105*** (0.006)	0.096*** (0.005)	0.100*** (0.005)	0.101*** (0.010)	0.091*** (0.009)	0.098*** (0.009)	0.100*** (0.012)	0.109*** (0.013)	0.116*** (0.013)
Class average competence scores, 8th grade	0.101*** (0.007)	0.134*** (0.007)	0.143*** (0.008)	0.143*** (0.012)	0.138*** (0.012)	0.170*** (0.012)	0.134*** (0.017)	0.123*** (0.016)	0.150*** (0.017)
Individual competence score deviation from class	0.038*** (0.006)	0.062*** (0.006)	0.072*** (0.006)	0.047*** (0.010)	0.038*** (0.010)	0.069*** (0.010)	0.104*** (0.012)	0.093*** (0.012)	0.117*** (0.013)
Rotter's external control	-0.021 (0.017)	-0.013 (0.015)	-0.014 (0.015)	-0.023 (0.027)	-0.021 (0.027)	-0.021 (0.027)	0.040 (0.034)	0.042 (0.035)	0.042 (0.035)
Social competence	0.003 (0.008)	-0.007 (0.007)	-0.006 (0.007)	0.013 (0.013)	0.012 (0.013)	0.014 (0.013)	-0.018 (0.016)	-0.014 (0.016)	-0.011 (0.016)
Self-esteem	0.011 (0.009)	0.015* (0.009)	0.016* (0.009)	-0.014 (0.015)	-0.013 (0.015)	-0.009 (0.015)	0.012 (0.019)	0.010 (0.019)	0.015 (0.019)
Depression scale	0.006 (0.018)	0.009 (0.015)	0.008 (0.015)	0.023 (0.028)	0.020 (0.028)	0.020 (0.028)	0.025 (0.035)	0.031 (0.037)	0.032 (0.037)

Admitted to first choice	-0.005 (0.009)	0.005 (0.008)	0.005 (0.008)	-0.033** (0.013)	-0.037*** (0.013)	-0.037*** (0.013)	0.018 (0.017)	0.013 (0.018)	0.013 (0.018)
Quality of sec. school	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Difference in school quality is 0	-0.020 (0.012)	-0.028*** (0.010)	-0.028*** (0.010)	0.131*** (0.021)	0.136*** (0.019)	0.136*** (0.019)	0.014 (0.027)	0.014 (0.026)	0.015 (0.026)
Graduated in 2011 (reference: year 2010)							-0.070*** (0.016)	-0.075*** (0.016)	-0.075*** (0.016)
Constant	-80.202*** (13.753)			9.924 (20.785)			-27.289 (28.624)		
Observations	9,050	9,050	9,050	6,316	6,316	6,316	3,905	3,905	3,905
R-squared	0.342	0.397	0.396	0.309	0.268	0.267	0.248	0.225	0.224
F-stat	128.8***			89.83***			34.02***		
p		.	.						
Log likelihood		-34168	-34222		-40760	-40846		-26234	-26269
chi2		1898***	1890***		1175***	1163***		671.3***	662.4***

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Other controls (in vector C): male; year of birth; number of siblings; birth order; respondent needs special education; respondent is Roma; type of settlement; county

Table 5

Blinder–Oaxaca type decomposition of educational choice between low-status (parent’s highest school qualification is vocational) and high-status (parent’s highest school qualification minimum high-school final exam) respondents

	Panel A			Panel B			Panel C		
Number of model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Ref. model in Table 4	(2)			(5)			(8)		
Population	8th grader in 2005/06			8th grader in 2005/06			Finished secondary school within 5 years		
Dependent variable	Secondary school (1) vs. vocational school (0)			Sec. general school (1) vs. sec. voc. school (0)			Admitted to state-financed tertiary education		
	Overall model			Overall model			Overall model		
Low status	0.689*** (0.007)			0.305*** (0.009)			0.243*** (0.011)		
High status	0.905*** (0.004)			0.514*** (0.009)			0.407*** (0.011)		
Difference	-0.216*** (0.008)			-0.209*** (0.013)			-0.164*** (0.016)		
Endowments	-0.179*** (0.009)			-0.141*** (0.010)			-0.106*** (0.011)		
Coefficients	-0.042*** (0.006)			-0.097*** (0.015)			-0.055*** (0.019)		
Interaction	0.005 (0.008)			0.029*** (0.011)			-0.003 (0.014)		
	Endowments	Coefficients	Interaction	Endowments	Coefficients	Interaction	Endowments	Coefficients	Interaction
Self-assessment	-0.012*** (0.004)	-0.002 (0.002)	0.001 (0.001)	-0.011** (0.005)	0.017* (0.009)	-0.018 (0.012)	-0.012*** (0.005)	-0.000 (0.012)	0.000 (0.001)
School marks	-0.047*** (0.006)	-0.001 (0.003)	0.000 (0.001)	-0.041*** (0.006)	-0.003 (0.014)	0.002 (0.012)	-0.033*** (0.006)	-0.002 (0.018)	0.000 (0.001)
Class average competence scores, 8th grade	-0.051*** (0.005)	-0.003 (0.002)	0.001 (0.001)	-0.059*** (0.007)	-0.005 (0.011)	0.006 (0.013)	-0.036*** (0.008)	0.032** (0.013)	-0.005 (0.016)
Individual competence scores deviation from class	-0.020*** (0.003)	-0.003** (0.002)	0.001 (0.001)	-0.012*** (0.003)	-0.012 (0.008)	0.009 (0.006)	-0.016*** (0.004)	0.001 (0.010)	-0.000 (0.001)
Rotter’s external control	0.000 (0.001)	-0.003 (0.004)	-0.000 (0.000)	-0.000 (0.000)	0.007 (0.018)	0.000 (0.001)	0.000 (0.000)	0.005 (0.019)	0.000 (0.000)
Social competence	0.000 (0.000)	-0.003 (0.020)	0.000 (0.000)	-0.001 (0.001)	-0.198** (0.087)	0.001 (0.001)	-0.000 (0.000)	-0.208** (0.095)	0.000 (0.000)
Self-esteem	-0.000 (0.001)	0.009 (0.017)	-0.000 (0.000)	0.002 (0.001)	0.093 (0.071)	-0.003 (0.002)	0.000 (0.001)	0.082 (0.076)	-0.000 (0.001)
Depression scale	-0.001 (0.001)	0.018 (0.016)	0.000 (0.000)	0.000 (0.001)	0.030 (0.073)	0.001 (0.002)	0.001 (0.001)	-0.018 (0.081)	-0.000 (0.000)

Admitted to first choice	-0.000 (0.000)	-0.007 (0.005)	0.000 (0.000)	0.001 (0.001)	-0.020 (0.022)	0.001 (0.001)	-0.000 (0.001)	0.003 (0.025)	-0.000 (0.000)
Quality of upper-sec. school	-0.007*** (0.002)	-0.000 (0.000)	0.000 (0.000)	-0.002 (0.003)	-0.000 (0.002)	0.000 (0.000)	0.001 (0.001)	0.005 (0.003)	0.000 (0.001)
Difference in school quality is 0	-0.001** (0.000)	0.002** (0.001)	0.000 (0.000)	0.001 (0.001)	-0.000 (0.003)	-0.000 (0.000)	0.000 (0.000)	-0.004 (0.004)	-0.000 (0.000)
Graduated in 2011 (reference: year 2010)							0.004** (0.002)	-0.005 (0.011)	0.000 (0.001)
Constant		-0.044 (10.072)			-16.691 (46.708)			-13.447 (52.745)	
Observations	9,050	9,050	9,050	6,316	6,316	6,316	3,905	3,905	3,905
Number of low status	5806	5806	5806	5806	3469	3469	3469	3469	1957
Number of high status	3244	3244	3244	3244	2847	2847	2847	2847	1948

Eq.6. is decomposed in this table.

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Other controls (in vector C): male; year of birth; number of siblings; birth order; respondent needs special education; respondent is Roma; type of settlement; county

TABLES IN APPENDIX

Table A1

Descriptive statistics about the components of competence scores and school marks principal components (PCA)

Parental background		Competence scores PCA		School marks PCA		
		Maths competence scores	Reading competence scores	School marks Maths	School marks Hungarian grammar	School marks Hungarian literature
Elementary school	mean	403.55	400.95	2.81	3.05	3.25
	sd	81.61	83.98	0.87	0.87	0.93
	N	1979	1979	1979	1979	1979
Vocational school	mean	453.16	446.47	3.09	3.34	3.54
	sd	87.69	90.26	0.95	0.95	0.97
	N	3827	3827	3827	3827	3827
High-school final exam	mean	497.76	486.91	3.45	3.69	3.91
	sd	96.70	96.72	0.99	0.96	0.94
	N	2189	2189	2189	2189	2189
Tertiary education	mean	545.14	536.02	3.90	4.10	4.31
	sd	104.23	103.55	0.97	0.86	0.82
	N	1055	1055	1055	1055	1055
Total	mean	463.82	456.74	3.21	3.45	3.66
	sd	100.63	100.87	1.00	0.98	0.99
	N	9050	9050	9050	9050	9050

In Hungary there are 5 school-marks: 1 is the worst, 5 is the best.

Table A2

Correlation coefficients between school mark PCA and its components as primary variables

Maths school marks, 8th grade	0.84
Hungarian grammar school marks, 8th grade	0.93
Hungarian literature, 8th grade	0.91

Table A3

Correlation coefficients between competence scores PCA and its components as primary variables

Maths competence scores, 8th grade	0.94
Reading competence scores, 8th grade	0.93

Table A4

**The explanation of educational choice, results from linear probability models
with school fixed effects**

	Panel A			Panel B		
	(1)	(2)	(3)	(4)	(5)	(6)
Comparable with model in Table 4	(1)	(4)	(7)	(1)	(4)	(7)
	Elementary school fixed effects			Secondary school fixed effects		
Dependent variable	Secondary school (1) vs. vocational school (0)	Sec. general school (1) vs. sec. voc. school (0)	Admitted to state-financed tertiary education	Secondary school (1) vs. vocational school (0)	Sec. general school (1) vs. sec. voc. school (0)	Admitted to state-financed tertiary education
Self-assessment	0.018*** (0.006)	0.045*** (0.009)	0.036*** (0.014)	0.016*** (0.005)	0.021*** (0.005)	0.031*** (0.011)
Parent's highest school qualification						
<i>Elementary</i>	-0.087*** (0.016)	-0.046* (0.024)	-0.058* (0.034)	-0.062*** (0.015)	-0.040*** (0.015)	-0.082*** (0.030)
<i>Vocational school</i>	-0.027*** (0.010)	-0.023 (0.016)	-0.031 (0.022)	-0.025*** (0.009)	-0.021** (0.010)	-0.035* (0.021)
<i>High-school final exam</i>	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
<i>Tertiary</i>	-0.025** (0.011)	0.117*** (0.021)	0.093*** (0.029)	0.002 (0.009)	0.038*** (0.012)	0.053* (0.027)
School marks, PCA 8th grade	0.109*** (0.007)	0.082*** (0.011)	0.090*** (0.017)	0.098*** (0.007)	0.026*** (0.007)	0.081*** (0.014)
Class average competence scores, PCA 8th grade	0.111*** (0.023)	0.116*** (0.040)	0.181*** (0.060)	0.056*** (0.008)	0.025*** (0.008)	0.075*** (0.019)
Individual competence scores, PCA 8th grade	0.026*** (0.007)	0.033*** (0.011)	0.106*** (0.015)	0.037*** (0.006)	0.027*** (0.007)	0.097*** (0.014)
Rotter's external control	-0.023 (0.020)	0.001 (0.031)	0.042 (0.045)	-0.002 (0.018)	0.003 (0.019)	0.063 (0.039)
Harter's social competence scores	0.008 (0.009)	0.013 (0.015)	-0.028 (0.021)	0.001 (0.008)	0.007 (0.009)	-0.003 (0.018)
Rosenberg's self-esteem scale	0.020* (0.011)	-0.002 (0.018)	0.019 (0.025)	0.017* (0.010)	-0.017 (0.010)	0.038* (0.023)
Depression scale	0.015 (0.020)	0.028 (0.032)	0.034 (0.046)	0.017 (0.019)	-0.011 (0.020)	0.006 (0.043)
Admitted to first choice	-0.013 (0.010)	-0.042*** (0.015)	0.002 (0.021)	-0.010 (0.009)	-0.007 (0.010)	-0.004 (0.020)
Quality of upper-secondary school compared to elementary school	0.003*** (0.000)	0.006*** (0.000)	0.003*** (0.000)			
Diff. in school quality is set to 0	0.018 (0.015)	0.147*** (0.026)	0.001 (0.035)			
Graduated in 2011 (reference: year 2010)			-0.048** (0.020)			-0.072*** (0.020)
Constant	-70.828*** (15.200)	10.095 (23.105)	1.021 (36.338)	-46.939*** (14.264)	-0.954 (14.774)	14.901 (32.863)
Observations	9,050	6,316	3,905	8,647	6,056	3,749
R2	0.509	0.540	0.517	0.510	0.783	0.444
Adjusted R2	0.386	0.384	0.278	0.440	0.740	0.272

Eq.7. was estimated in this table.

Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Other controls (in vector C): male; year of birth; number of siblings; birth order; respondent needs special education; respondent is Roma; type of settlement; county

School effects are absorbed.

Table A5

Logit average marginal effects, separate models for low-status (parent's highest school qualification is vocational) and high-status (parent's highest school qualification is minimum high-school final exam) pupils

	Panel A		Panel B		Panel C	
	(1)	(2)	(3)	(4)	(5)	(6)
Refers to Panel model in Table 5	(A)	(A)	(B)	(B)	(C)	(C)
Dependent variable	Secondary school (1) vs. vocational school (0)		Sec. general school (1) vs. sec. voc. school (0)		Admitted to state-financed tertiary education	
Subsample	Low status	High status	Low status	High status	Low status	High status
Self-assessment	0.019*** (0.006)	0.015*** (0.005)	0.054*** (0.010)	0.030** (0.012)	0.031** (0.014)	0.043*** (0.016)
School marks, PCA 8th grade	0.128*** (0.007)	0.053*** (0.006)	0.088*** (0.013)	0.106*** (0.014)	0.092*** (0.018)	0.129*** (0.019)
Class average competence scores, PCA 8th grade	0.171*** (0.011)	0.079*** (0.008)	0.133*** (0.016)	0.165*** (0.018)	0.154*** (0.022)	0.120*** (0.023)
Individual competence scores, PCA 8th grade	0.074*** (0.009)	0.044*** (0.007)	0.026** (0.013)	0.060*** (0.014)	0.084*** (0.017)	0.111*** (0.017)
Rotter's external control	-0.026 (0.021)	0.006 (0.019)	-0.013 (0.035)	-0.037 (0.042)	0.048 (0.045)	0.046 (0.052)
Harter's social competence scores	-0.009 (0.010)	-0.002 (0.009)	-0.015 (0.017)	0.045** (0.019)	-0.046** (0.020)	0.021 (0.025)
Rosenberg's self-esteem scale	0.023* (0.013)	0.003 (0.011)	0.004 (0.021)	-0.039* (0.023)	0.029 (0.026)	-0.010 (0.029)
Depression scale	0.025 (0.021)	-0.013 (0.018)	0.028 (0.038)	0.007 (0.044)	0.018 (0.050)	0.044 (0.055)
Admitted to first choice	-0.000 (0.011)	0.014 (0.009)	-0.047*** (0.017)	-0.027 (0.021)	0.014 (0.024)	0.015 (0.025)
Quality of upper-secondary school compared to elementary school	0.002*** (0.000)	0.001*** (0.000)	0.003*** (0.000)	0.004*** (0.000)	0.001*** (0.000)	0.001 (0.000)
Diff. in school quality is set to 0	-0.024 (0.015)	-0.036*** (0.012)	0.124*** (0.024)	0.148*** (0.031)	-0.017 (0.037)	0.038 (0.040)
Graduated in 2011 (reference: year 2010)					-0.070*** (0.023)	-0.078*** (0.023)
Observations	5,806	3,244	3,469	2,847	1,957	1,948
Log likelihood	-26353	-7546	-20406	-20405	-11270	-14719
Chi-squared	1300***	471.2***	562.1***	555.8***	305.1***	337.8***
R2	0.332	0.439	0.243	0.241	0.243	0.188

Eq.6. was estimated in this table.

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Other controls (in vector C): male; year of birth; number of siblings; birth order; respondent needs special education; respondent is Roma; type of settlement; county