Would they succeed if they tried? An analysis of the role of self-assessment in educational transitions[*]

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Abstract
This paper employs the theoretical framework offered by the Breen–Goldthorpe model and focuses on how the probability of success influences educational decisions. As a new aspect, the role of perceived ability (self-assessment) is analysed in the transitions to secondary and to tertiary education. It will be argued that class differences in self-assessment might be connected to pupils' information about the role of ability and effort in education. Having inaccurate information, low-status pupils usually give lower estimations of their abilities than do their equally able high-status peers. This difference could act as a self-fulfilling prophecy and might provide greater insight into why adolescents with disadvantaged status are reluctant to choose demanding education. Because status differences in self-assessment are regarded as the imprint of biased information, the paper concludes that the status gap in educational decisions would decrease if low-status pupils received guidance about the essential requirements for further education.

Key words
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-codes
D83, J24, I24, J62

Highlights
- Focuses on the status gap in educational decisions
- Examines relationship between perceived ability and educational choices
- Finds that low self-assessment contributes to the choice of less-demanding education
- Argues that self-assessment is an imprint of status-related beliefs about the role of effort and ability
- Concludes that there is a need to provide information on how to achieve a certain educational level

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1. Introduction

Stimulating low-status pupils' educational choices should promote educational equality (OECD, 2011), which has special importance since some of the differences in academic achievement between pupils who belong to advantaged and disadvantaged groups are actually symbolic barriers (Steele and Aronson, 1995; Steele, 1997). 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 (Breen and Goldthorpe, 1997), with a focus on understanding status differences in educational transitions. The research goes beyond interpretation of *success probability* in these models and claims that existing class-based differences in the way pupils estimate their own abilities inform our understanding of status gap in educational decisions.

1.1. Status differences in educational decisions: rational choice theory

Rational choice theory is one of several theoretical frameworks used to understand inequalities in educational opportunities (Stocké et al., 2011). Its relative importance among the other theories arose 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. Since then more research has examined why it is that pupils from different social classes make different educational decisions, even if their abilities are the same (primary effects). Distinguishing these primary factors from those that are left once ability is controlled for (secondary effects) is clearly one important vein of educational inequality research (Karlson and Holm, 2011).

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 maintain the same social class position as their parents. 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.

Empirical analysis has mainly focused on the risk aversion component of this model (Davies, Heinesen and Holm, 2002). Need and de Jong (2000) investigated the decision 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. The offspring of better-educated parents had higher aspirations, which was interpreted as a sign of striving to avoid the risk of downward mobility. 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.

Turning towards risk aversion is clearly one research direction implied by the Breen–Goldthorpe model. Status differences in ability could be another indication for the model. Focusing on that topic, new questions might be raised concerning the theoretical difference between ability and its perception (Blumenfeld, et al., 1982).

1.2. Why perception of ability might be important in educational decisions

The Breen–Goldthorpe model recognizes that knowledge of their own ability shapes the subjective probability that pupils attach to being successful at the next stage of education (Breen and Goldthorpe, 1997: 285). There is a strand of previous analysis showing that parents' estimations about their children's probability of success (Stocké, 2007), adolescents' own success probability (Keller and Neidhöfer, 2014; Tolsma, Need and de Jong, 2010) and subjective ability measured according to the level of education that pupils think they can achieve (Need and de Jong, 2000) can explain educational decisions, even after controlling for ability.

Underestimated ability could act as a self-fulfilling prophecy and get in the way of pupils opting for knowledge-intensive education (Sjögren and Sällström, 2004), simply because pupils do not dare to strive for better school qualifications, which they could easily attain if they only tried. Overestimated ability, on the other hand – when 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 into a widening of the gap in human capital between those with and without self-confidence.

The way pupils judge their own ability could be connected to how pupils regard themselves. Self-esteem – the success achieved by a person, relative to that person's expectations of himself (James, 1890: 310) – is considered to maintain protection against psychological or physical stress arising from the fear of performing badly (Himmler and Koenig, 2012). 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, self-efficacy influences learning activities via such self-regulatory processes as setting goals (Zimmerman, 2000: 87). As people engage in tasks where they think they will succeed, self-efficacy is shown to influence the choice of career or university majors (empirical evidence is summarized by Pajares, 1996).

Even though there is ample research demonstrating that self-perception – and more particularly perception of ability – contributes to educational outcomes, much less evidence has been gathered about its status profile. In particular, more information is needed about how status differences in education are connected to status differences in perceived ability.

1.3. On the status profile of probability of success and its role in educational decisions

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 loss. 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. On the other hand, 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 a greater probability of success (*p2*) if they are to opt for the same level of education chosen by their middle-class peers. Middle-class pupils, however, since they are propelled by the fear of status loss, could attain the same level of education with a lower probability of success. Since probability of success might have an objective (in the form of school grades or test scores) and a subjective (self-assessment) component, both should compensate for lower educational motivation among pupils in lower strata.

[Figure 1 around here]

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. From previous literature, however, one might suspect that the probability of success does not compensate for the low level of educational motivation among low-status pupils. Therefore 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*. Sullivan (2006) reports a survey in which pupils in England were asked to predict the outcome of their GCSE exam a couple of months before they actually sat it. A comparison of the estimates with the actual results showed that pupils from lower classes systematically underestimated their ability, compared to their more advantaged peers. Since only a month or so elapsed between the measurement of self-assessed and real performance, reverse causation (working-class pupils making more rapid progress) could be excluded.

Based on these considerations, it will be argued that success probability (ability and perceived ability as well) might influence more low-status pupils' educational decisions. However, there should be more investigation into the possible causes of why it is that low-status pupils have a worse perception of their ability.

1.4. Why status differences in perceived ability might exist

Breen (1999) argues that social differences in subjective probabilities might exist because various status groups have different information about the educational system; moreover in determining success at school, they estimate the role of effort and ability differently. Working-class pupils attach lower belief in the role of effort than do their peers in the middle class, and therefore they are more pessimistic about the prospects of success (Breen, 1999: 471). Lucas (2009) also claims that 'myopia' – lack of information about subjective changes in future success – has more unpleasant consequences for pupils of low status than for their high-status peers, since the parents of high-status pupils strive to afford any kind of help required to maintain the positions of advantage, and this could compensate for not having appropriate information about their own abilities and possibilities.

Empirical research reinforces the idea that families in different social strata employ different parenting styles, which could be translated into different perceptions of personal

ability. Baker and Stevenson (1986) found that mothers with higher socioeconomic status were more likely to have accurate knowledge of their child's schooling, to have had contact with the school, and to have employed different strategies to help their children in their school-related duties. Poorly educated mothers, on the other hand, have less interest in the schooling progress of their children. Other research reinforces the notion that, unlike children in working-class and poor families, middle-class children are deliberately stimulated by their parents in order to foster their cognitive and social skills (Lareau, 2003). Dufur, Parcel and Troutman (2013) showed that 'home capital' – assessed as the frequency of parent–child discussion of school activities and the frequency with which parents check homework – significantly increased academic achievement (measured by test scores in maths, reading literacy and science).

If parents of different social status employ different parenting styles and have different information about the role of ability and effort in terms of academic achievement, it is plausible to assume that they give their offspring different feedback on their ability, which could be translated into status differences in self-assessment. Since low-status pupils and their parents overstate the importance of ability and downgrade the role of effort in education (Breen, 1999), lower self-assessment is hypothesized among pupils in lower strata.

1.5. The purpose of the analysis

This paper broadens understanding of the role of success probability in educational decisions by distinguishing actual ability (school grade or ability) from perceived ability. Even though these two concepts are naturally correlated, they could both contribute individually to future school-track choice. While the consequences of status differences in ability are well known in educational decision-making, much less attention has been devoted to the same differences in perceived ability, especially in connection with later educational outcomes. The analysis therefore will delve more deeply into this.

Our knowledge in terms of status-related educational decisions will be expanded by providing empirical evidence on the following three questions:

1. Are there status differences in perceived ability (self-assessment)?
2. Does self-assessment influence educational decisions?
3. Does the status gap in educational decisions depend on self-assessment?

2. Material and methods

2.1. Data

The data are derived from 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-old individuals at the beginning of the 9th grade.

This survey can be merged with 8th grade (from academic year 2005/06) PISA-like test scores in mathematics and reading literacy skills for the same students. The test (Hungarian National Assessment of Basic Competences, NABC) is centralized: developed and organized by the Hungarian Educational Authority. NABC contains administrative data about the entire school cohort.

The sample in the analysis contains data on those who began secondary school in 2006/07. Therefore a restriction is applied to those who did not drop out at the end of 8th grade and did not choose the early secondary track after 4th or 6th grade.[1] Pupils with special educational needs are also excluded.

2.2. Educational choices in Hungary

The empirical analysis focuses on two educational transitions. These are not the first educational choices that someone makes in his or her life; and 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). 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 secondary school 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 subsequently provide an opportunity to go on to tertiary education, whereas there is no direct entry to tertiary education from a vocational school (*szakiskola*). The term 'secondary school' (*középiskola*) will henceforth be used as a generic term for secondary general and secondary vocational school.

The second educational transition analysed here occurs after the completion of compulsory education: whether or not pupils enter tertiary education (college or university). 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 achieve an adequate standard in the entrance examination. This regulation basically means that approximately every second applicant can study free of charge at university level.[2]

2.3. Definitions

2.3.1. Educational choices at secondary level

The educational decision at the secondary level was defined on the basis of the track that pupils are following at the beginning of the 9th grade (three possible categories), using HLCS data and as reported by parents. In the empirical analyses two dummy variables will be employed. The first is coded 1 if someone has been admitted to secondary school (secondary general or secondary vocational school – the schools from which there is potential access to

[1] Pupils have the opportunity to enter secondary general school after the 4th or the 6th grade, but the majority of pupils go on to secondary school after the 8th grade. Usually talented high-status pupils choose the early track. This selection could therefore bias the estimations.

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

tertiary education) and 0 if someone is at vocational school. The second dependent variable deals with the difference between secondary general school (coded 1) and secondary vocational school (coded 0). The reason for using binary categories rather than multinomial is that the choice between general and vocational secondary school is a horizontal decision, while the choice between vocational school and any other kind of secondary school is vertical.[3]

2.3.2. Educational choices at tertiary level

Tertiary education is defined on the basis of pupils' answers in HLCS about the type of tertiary education (college or university) they are enrolled in. Those who have actually been admitted to state-financed tertiary education (coded 1) are compared to those who had the opportunity to go on to such education – i.e. sat the high-school final exam – or who entered fee-paying tertiary education (coded 0). 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.

Note that the population in this case is restricted to those who passed their high-school final exam (*érettségi*) and completed their secondary education within five years of commencing it (there are no data about respondents later; HLCS has six completed waves). Pupils could be enrolled in tertiary education in the year of their high-school final exam, or one year after. This shortcoming of the HLCS could result in right-censored data.

Table 1 contains the mean, standard deviation for the three dependent variables in the analysis.

[Table 1 around here]

2.3.3. Self-assessment

Self-assessment is measured using the following 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?' Since the hypothetical class average is indicated in the wording of the question, self-assessment is measured relative to that. The self-assessment measure is standardized with 0 mean and one unit standard deviation.

Note that this question refers to performance at 8th grade, 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.

2.3.4. Ability

Ability or academic/school performance is measured by standardized test scores in mathematics and reading literacy, and by school marks. While the test scores are a more objective measure of ability, since it is assessed by means of a centralized test and is corrected

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

by external examiners who do not know the pupils personally, school marks might be more sensitive to teachers' evaluation. Note that even test points can be regarded as an outcome of the school system, and therefore it is not necessarily a perfect measure of ability.

Test scores in NABC are measured at the end of the 8th grade, usually in May. A composite measure is used – the first extracted principal component (PC) in maths and reading literacy scores as primary variables, henceforth called the competence score. The two primary variables correlate with the extracted PC at around 0.9, while the correlation between maths and reading test scores is 0.7.

School grades are the grade point average (GPA) based on the mid-term report card in 8th grade, taking all school subjects into account. These grades are acknowledged at the time of admission to secondary school and remain unaffected by the competence score, since pupils receive a mid-term report card usually in January. Missing GPA (12 per cent) were replaced either with the available grade in maths or Hungarian, or the GPA measured at the end of the 7th grade, or else with the class average. GPA is reported by the school, and is available in NABC as additional information.

Both competence scores and GPA are derived from NABC, and therefore the classroom average could also be computed. In order to have similar (relative to classmates) measures to self-assessment, both measures appear as a classroom average and the individual deviation from that. Therefore, for every individual one can calculate the average performance in the classroom, and – by subtracting this average from the actual score – individual deviation from the class average. With two different measures (competence scores and GPA) four variables for ability will appear in the empirical analysis. All these variables are standardized with 0 mean and one unit standard deviation.

2.3.5. Parental background

Parental background is defined by the parents' (biological or step) highest level of schooling. Four categories were used: elementary school, vocational, high-school final exam and tertiary education. If both the mother's and the father's educational levels were available, and if they were not the same, the higher of the educational levels was used.[4] Educational level was reported by the parents themselves in HLCS. This way reveals a larger status gap in achievement than if children report their parents' educational level (Jerrim and Micklewright, 2014).

Occupation is a more frequently used proxy for social class, but that is available in neither HLCS nor NABC. In terms of educational decisions, schooling might anyway be 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 in Hungary. Also the theoretical considerations on which the argumentation is based claim that pupils strive to attain the same occupational level as their parents (Breen and Goldthorpe, 1997).

Henceforth the expression 'status gap' will refer to the difference (self-assessment or educational decision) between those pupils with elementary- and with tertiary-educated parents. Descriptive statistics about self-assessment, competence scores and school marks (the major intendant variables) are summarized in Table 2.

[Table 2 around here]

[4] Results are robust to use of other kinds of definition, such as only mother's or only father's educational level.

2.3.6. Psychological variables

The way pupils rate their own ability could be influenced by some psychological traits. In a limited scope, pupils' personality traits are investigated by HLCS. Rotter's (1966) locus of control scale measures the degree of control that individuals have over their lives. Rosenberg's (Rosenberg, 1965) self-esteem estimates the overall evaluation of one's worth or value. Harter's (1982) social competence scores provide information on whether a pupil feels an important member of his/her school class. Moreover a depression scale was constructed from questions about anxiety and suicidal thoughts.

2.3.7. Control variables

The following control variables were used, though the estimated effects of the variables do not appear in the tables: gender; year of birth; number of siblings; birth order; respondent is Roma (dummy); type of settlement (rural, town, county seat, capital); and county of residence (19 dummies).

2.3.8. School fixed effects

If there is a sorting of students across schools, endogeneity might occur, especially since the heterogeneity of schools is considered quite remarkable in Hungary (Horn, 2013).

Following the logic of Falch and Strom (2011), 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 select a school to work in on the basis of its pedagogical programme, so that it is not just pupils but also teachers that are not randomly distributed among schools.

Even though HLCS is not a school-based survey, school-level information for the 8th grade can be merged with it from NABC, and 9th grade school IDs are available in HLCS.

2.4. Reverse causality

In an ideal situation, self-assessment should be measured before the educational transition. Since the wording of the self-assessment 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. As things stand, however, reverse causality might be a factor: something could have shocked individual perceptions, and under the influence of this shock, pupils' estimations of their own ability are biased. The shock could be connected to the way in which pupils were allocated to different secondary schools.

Note that pupils enter secondary education on the basis of the order of preference they indicate on their application form, 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.

It is quite reasonable to assume that those who did not get into their first-preference school downgraded their 8th grade performance retrospectively. Moreover, those who were admitted to a competitive secondary school could have upgraded their self-assessment retrospectively; the same is true in the opposite direction for those who were admitted to a weak secondary school.

To deal with reverse causality, and fix the systematic shock in self-assessment, school fixed-effect regressions are employed, controlling for unobserved school-level heterogeneity. Both 8th and 9th grade school IDs are employed.

2.5. Models

2.5.1. Status differences in self-assessment

When calculating the differences in self-assessment according to parental background, raw differences are shown first. These are refined using multivariate fixed-effect ordinary least squares (OLS) models, where, in addition to parental background, self-assessment is explained by ability, psychological variables, school fixed effects and control variables.

Eq.1 shows the estimated model, where *SA* stands for self-assessment, *PB* for parental background, and *A* is a vector for ability containing school marks and competence scores. *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, whether the respondent is Roma, plus type of settlement and county of residence. *S* stands for school fixed effects; separate models are fitted using elementary and secondary school unobserved school-level heterogeneity. In the equation ε stands for individual error term. The β-s are the vectors of OLS coefficients; and α is the constant in the equation.

The results appear in Table 3. Throughout this exercise the focus is on the impact of parental background (β_1) and how its effect is mediated by additional control variables.

$$SA = \alpha + \beta_1 \times PB + \beta_2 \times A + \beta_3 \times P + \beta_4 \times C + \beta_6 \times S + \varepsilon \qquad \text{(Eq.1)}$$

2.5.2. Self-assessment and educational choices

The second research question concerns 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 the case of 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, the difference between secondary general and secondary vocational schools is analysed. In the last set of models, the transition to state-financed tertiary education is the focus of attention. Here, 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*), parental background (*PB*), ability (*A*), psychological controls (*P*), school fixed effects (*S*) and other individual-level control variables (*C*). Unobserved school heterogeneity deals with the unknown selection of pupils into schools, which could also influence self-reported ability (self-assessment). Both elementary and secondary-school unobserved school heterogeneity is controlled for in different models, but since secondary-school fixed effects are provided to rule out more profoundly the retrospective bias in self-assessment, these fixed effects are used further in the analysis. In the case of entry to tertiary education, an additional variable appears in the regression, indicating the year in which pupils graduated from secondary school (*U*).

Linear probability models are preferred to logit and probit models. Partly because the calculation of marginal effects using conditional non-linear models could be biased

(Fernández-Val, 2009), and the same problem could arise when calculating the interaction effect (Buis, 2010; Norton, Wang and Ai, 2004).

Hence the following model was fitted:

$$Y = \alpha + \beta_1 \times SA + \beta_2 \times PB + \beta_3 \times A + \beta_4 \times P + \beta_5 \times S + \beta_6 \times C\ [+ \beta_7 \times U] + \varepsilon \quad \text{(Eq.2)}$$

2.5.3. Self-assessment as moderator of the status gap in educational choices

Moderator variables are understood as variables that affect the direction and/or strength of the relationship between the independent and the dependent variable (Baron and Kenny, 1986; Muller, Judd, & Yzerbyt, 2005). In that sense, self-assessment could moderate status gap in educational decisions if the magnitude of the status gap depends on self-assessment; or, in other words, if the impact of self-assessment differs across social status. Statistically, the moderation effect is assessed by the interaction between parental status and self-assessment. Eq.3 therefore differs from Eq.2 in that it contains the interaction term as well.

$$Y = \alpha + \beta_1 \times SA + \beta_2 \times PB + \beta_3 \times (PB \times SA) + \beta_4 \times A + \beta_5 \times P + \beta_6 \times S + \beta_7 \times C\ [+ \beta_8 \times U] + \varepsilon \text{ (Eq.3)}$$

3. Results

3.1. The determinants of self-assessment

Table 3 shows the results of estimations explaining self-assessment. Column 1 reports the raw status gap, the size of which is more than one standard deviation, considering the differences in self-assessment between those with elementary- and with tertiary-educated parents. Since this gap is measured relative to class average, it is interesting to compare it to the same differences in school marks and competence scores (individual differences in Table 2). As one can see, status differences in self-assessment are somewhat larger than the same gaps in ability measures.

Based on Column 2 (Table 3), one can establish that approximately 40 per cent (0.655/1.074) of the status differences are mediated through ability differences, which means that low-status pupils estimate their abilities lower (since their individual academic achievement is also lower) than their socially more advantaged peers. Another explanation for the status gap in self-assessment is that low- and high-status pupils probably attend quite different classrooms. When we include classroom-level characteristics (like average school marks and average competence scores) (see Column 3), the status difference in self-assessment decreases further. Status differences in self-assessment might also be connected to unobserved school-level heterogeneity: controlling for 8th grade school characteristics (fixed effect regression), the status gap in self-assessment shows a further decrease (Column 4). However, school differences at 9th grade have a higher impact on self-assessment than those at 8th grade (Column 5), which means that pupils' reports of self-assessment are more a function of 9th grade school characteristics than 8th grade. This is natural, since self-assessment was carried out at the beginning of the 9th grade. This serves to underline the reasoning that, depending on the quality of the secondary school, pupils might revise their 8th grade achievement retrospectively. Furthermore it highlights the importance of controlling for 9th grade school-level heterogeneity in order to minimize the bias arising from reverse causality.

Psychological traits (as well as other control variables) also mediate the status gap in self-assessment. The correlation between self-assessment and psychological variables works in the assumed direction: internal control, self-esteem and social competences maintain a positive relationship with self-assessment, while the relationship is negative in the case of the depression scale.

Even after controlling for an extended set of individual, classroom and school-level explanatory mechanisms, a remarkably large part of the status differences – approximately a fifth (0.175) of the standard deviation – remains unexplained. This residual is interpreted as the imprint of status differences in parenting styles and parental values, and might work in later educational decisions as self-fulfilling prophecies.

[Table 3 about here]

3.2. Educational choices and self-assessment

Table 4 summarizes the results for the role of self-assessment in educational transitions. In the three panels of the table, three different dependent variables appear: the choice between secondary school and vocational school (Panel A), between secondary general and secondary vocational school (Panel B) and admission to state-financed tertiary education versus no tertiary education or no state-financed tertiary education after the high-school final exam (Panel C).

Self-assessment has a significant positive effect in every model presented. The impact ranges from 0.058 to 0.020 across the models, which is approximately 2–6 per cent of standard deviation. In absolute terms, this is quite a small impact; however, one should consider that in the choice of secondary education (Panels A and B) individual competence scores have roughly the same impact (that coefficient also ranges from 0.017 to 0.058).

Comparing the first two models in each panel highlights the importance of controlling for 9th grade school-level heterogeneity, instead of using 8th grade fixed effects. Since the estimations for self-assessment in models containing school-level heterogeneity for the secondary school are lower, pupils' self-assessment might be affected by the quality of the secondary school to which they were admitted. Therefore 9th grade school fixed effects might control better for the retrospective bias in the self-assessment measure. This bias is especially large in the choice between secondary general and secondary vocational schools (Panel B) – which is more of a horizontal difference in secondary education – and is therefore in line with the reasoning that pupils revise their self-assessment in the light of the quality of the secondary school to which they are admitted.

Examining the status gap in the second and third models within each panel gives some clue about the importance of self-assessment in mediating the status gap in educational decisions, since the third model in each panel is equivalent to the second, but without self-assessment. The status gap is always smaller in the second model than in the third, and the difference between the two models is the mitigation effect of self-assessment; or put differently, the status gap in educational decisions is mediated through self-assessment. If low- and high-status pupils had equal self-assessment, the status gap in educational decisions would decrease by an additional 4 [(0.096-0.092)/0.096] or 5 per cent [(0.076-0.072)/0.076], compared to the situation if the two groups had equal scores in ability, psychological traits and control variables. The results show that self-assessment is one element of the status differences in educational decisions.

Comparing the results across the three panels, in Columns 2 and 5 one could establish that the impact of self-assessment is approximately the same for horizontal (Panel A) and vertical (Panel B) educational decisions at the secondary level. The somewhat larger figure in Column 8 leads to an interpretation that self-assessment might incorporate later progress in ability and school achievement, which could be especially important in future educational choices – like entry to tertiary education.

It should be highlighted that individual-level school marks have a higher impact on the choice to embark on further education than does the probably more objective ability measure – the competence scores. However, one could also argue that school marks are more accurate measures, since they reflect pupils' performance over a longer time period, rather than on one actual point in time. Whatever interpretation is approved, elementary school teachers carry much responsibility to reward academic achievement with school marks, since the marks might be interpreted by pupils as feedback on individual ability, which can also have medium-term educational consequences – such as the choice to go on to tertiary education.

Among psychological traits, only self-esteem was proved to be a significant predictor of educational choice – and then only for the choice between secondary or vocational school. These findings underline the importance of self-assessment, which correlates with psychological variables, but unlike those has an influence on future educational decisions.

[Table 4 about here]

3.3. The moderation effect of self-assessment on the status gap in educational decisions

Table 5 contains the estimations for the interaction between parental background and self-assessment. Column 1 shows the choice between secondary and vocational school. The interaction term (in categories of parental education: high-school final exam and tertiary education) is negative, showing that self-assessment might moderate the status gap in educational decisions.

It is often difficult to imagine the interaction effect solely on the basis of estimated coefficients (Brambor, 2005). Therefore Figure 2 helps us to visualize the predicted probabilities of being admitted to secondary rather than to vocational school. The gap (in predicted probability) shows a decreasing pattern if self-assessment increases and all other variables in the models are held at the mean value. This occurs, since pupils of lower status (with the exception of those with tertiary-educated parents) have a higher probability of entering secondary school, the higher their self-assessment. However, the speed of the decrease is largest among the two low-status groups.

[Figure 2 about here]

Even though among those with tertiary-educated parents predicted probability decreases with increasing self-assessment, care needs to be taken when interpreting these results as a sign of the negative consequences of being over-confident. As the distribution of self-assessment is shifted left (at the top of the graph), low values of self-assessment are less frequent and are probably rarer among high-status pupils who should have higher academic achievement. That said, the estimations for high-status pupils are probably less reliable, which is partly indicated in the larger confidence intervals. Moreover, as Column 2 of Table 5 indicates, there is no interaction effect in the choice between secondary general and secondary vocational school (the vertical difference between secondary schools). If self-assessment is

harmful among high-status pupils, it should also decrease the probability that they will choose the secondary general school, which is clearly not the case (as Model 2 shows).

The results should be interpreted much more as a sign that self-assessment helps low-status pupils to take the first step in educational mobility and to choose a secondary school instead of a vocational one. Self-assessment has less of a role to play in moderating the status gap in more qualitative educational choices at the secondary level. At the tertiary level (as Column 3 indicates) self-assessment widens the status gap, probably because it might contribute to future gain in ability, as mentioned earlier in connection with the somewhat higher coefficients of self-assessment for the choice of going on to tertiary education (Table 4, Column 9).

[Table 5 about here]

4. Discussion

This paper argues that the lower probability among pupils with disadvantaged status of choosing knowledge-intensive educational scenarios can party be attributed to their underestimated abilities. Low-status pupils usually have lower self-assessment, even if they have the same academic achievement as their more advantaged peers, as the unexplained status gap shows – after controlling for individual, classroom and school-level characteristics. It is argued that this residual is the imprint of the transmission of parental values (Corneo and Jeanne, 2010) or the consequences of status differences in parenting styles (Lareau, 2003) – especially how effort and ability are understood to determine school success (Breen, 1999).

On the other hand, self-assessment increases the probability of pupils choosing more knowledge-intensive educational scenarios. Its impact is only partly transmitted through ability; moreover it further decreases the status gap in educational decisions. In terms of the likelihood of a pupil opting for more demanding education, a one-unit increase in self-assessment has almost as much effect as a one-unit increase (relative to the class average) in a centralized test measuring school performance in maths and reading. These findings add to the scholarship of previous analyses on educational transitions with the focus on pupils' success probability (Keller and Neidhöfer, 2014; Tolsma, Need and de Jong, 2010) or – using a somewhat different measure – their self-assessed ability (Need and de Jong, 2000).

Unlike previous analyses on this topic, alongside tertiary education, the transition to secondary education was also reviewed in this analysis. Moreover, after the German (Keller and Neidhöfer, 2014) and Dutch (Tolsma, Need and de Jong, 2010) examples, the Hungarian case was demonstrated. As a further step, the analysis shows that self-assessment moderates the status gap in educational decisions, since its impact varies across status. This finding contradicts those of Tolsma, Need and de Jong (2010), and is in line with the theoretical consideration that higher-status pupils opt for a more demanding level of education, even with a low probability of success, in order to avoid downwards mobility (Breen and Yaish, 2006; Esser, 1999).

Future analysis should investigate more profoundly some assumptions made in the paper, which are not directly verified. Based on theoretical considerations (Breen, 1999; Corneo and Jeanne, 2010), it was assumed that the unexplained gap in self-assessment after controlling for individual, classroom and school-level factors is the imprint of parental beliefs. It was beyond the scope of this paper to justify this assumption, and space is left for future research to find alternative explanations.

As has been argued, self-assessment might help low-status pupils to overcome internalized parental models, which operate as symbolic barriers to opting for demanding education. In this sense, self-assessment is partly interpreted as 'given by nature'. Future research should clarify more profoundly the extent to which self-assessment could be shaped by family factors. To some extent the research by Keller and Neidhöfer (2014) indicates this direction.

Since status differences in self-assessment are understood as an imprint of biased information about the role of effort and ability in educational decision-making, it is plausible to assume that providing more information about the requirements of demanding education would narrow the status gap in educational decisions. More careful future analysis should, however, decide whether the impact of self-assessment in track choices decreases considerably if accurate information is provided.

4.1. Limitations

There are some limitations to the results which should invite careful reading, above all because of the retrospective character of self-assessment. Even though the inclusion of secondary school fixed effects rules out somewhat the bias that arises from the fact that pupils revise their ability depending on the secondary school they get into, the relationship between self-assessment and educational decision is not necessarily causal. However, a promising feature of the results is that self-assessment influences the choice of tertiary education, which is clearly unaffected by the retrospective nature of self-assessment.

The impact of self-assessment is probably underestimated in the analysis. Ability and school achievement could both be products of self-assessment; therefore an early-childhood measure would be more appropriate. The finding that the impact of self-assessment was estimated to be higher in the decision to go on to tertiary education also shows in the direction that self-assessment could indicate later academic achievement. Moreover, the ceiling effect could also result in lower estimations: since self-assessment is measured on a scale of 0–100, and the hypothetical class average is fixed (70), there may be limited scope to express outstanding performance relative to classmates.

4.2. Conclusion

The choice of secondary education (at age 14) is probably the first educational decision where pupils have a say. Self-assessment could therefore be important for low-status pupils if it helps them to decide to break away from parental models and opt for more demanding education. This way of reasoning assumes that sometimes symbolic barriers block the choice of going on to better education. If parents or teachers assume that particular pupils will not succeed in further education, these assumptions might work as self-fulfilling prophecies and put off pupils from striving for that educational goal. This reading of the results is in line with the findings of previous randomized experiments, which showed that the academic performance of pupils got worse if they had to report their class position (Hoff and Pandey, 2004) or race (Steele and Aronson, 1995; Steele, 1997). These results were also interpreted as showing that inbuilt stereotypes could sometimes block academic achievement.

Since the status gap in self-assessment is understood as the imprint of class-specific parental beliefs about education, appropriate information about the role of ability and effort in attaining a particular educational level might help to mitigate the status gap in educational decisions. This conclusion builds on the results of previous investigations (Jensen, 2010;

Nguyen, 2008) that educational decisions might be reconciled in the light of information about the returns available from education.

Overall, this study contributes to an understanding of how low-status pupils could be stimulated to opt for demanding education. As has been shown elsewhere, inducing pupils to think that they are highly able is more of an ego-centred than a task-centred exercise, and is therefore perceived to be a less effective way of developing ability (Nicholls, 1990: 39). The results demonstrated in this paper therefore illustrate the importance of providing low-status pupils with accurate information on how to achieve a certain educational level, and especially on the role of effort and ability in the process. Future research should clarify whether it is more effective if information is provided by an impersonal authority, or if pupils in a classroom are stimulated to convince each other.

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Figures

Figure 1: The association between educational motivation and probability of success – points of equilibrium and perceived deviation from it, by parental background

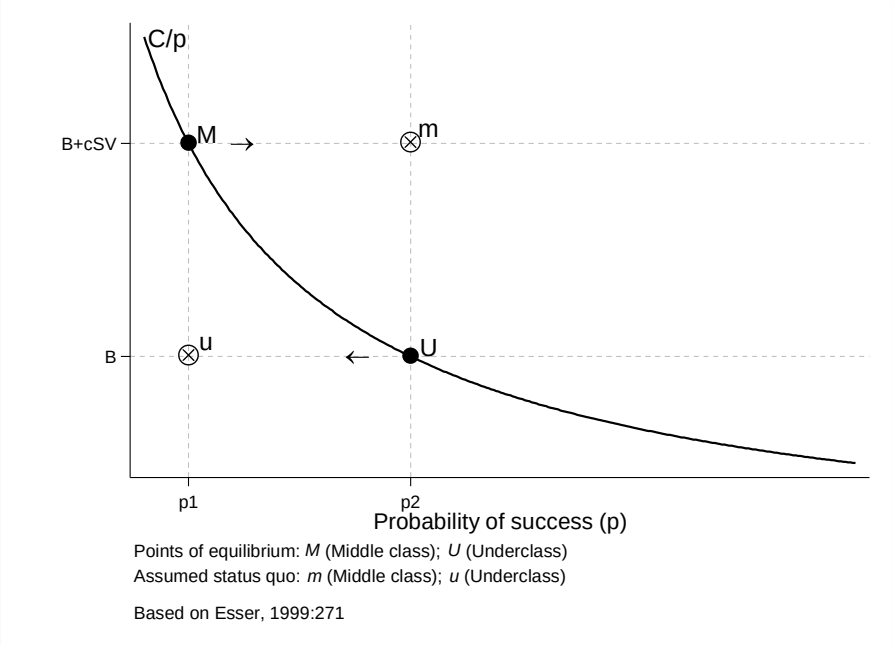
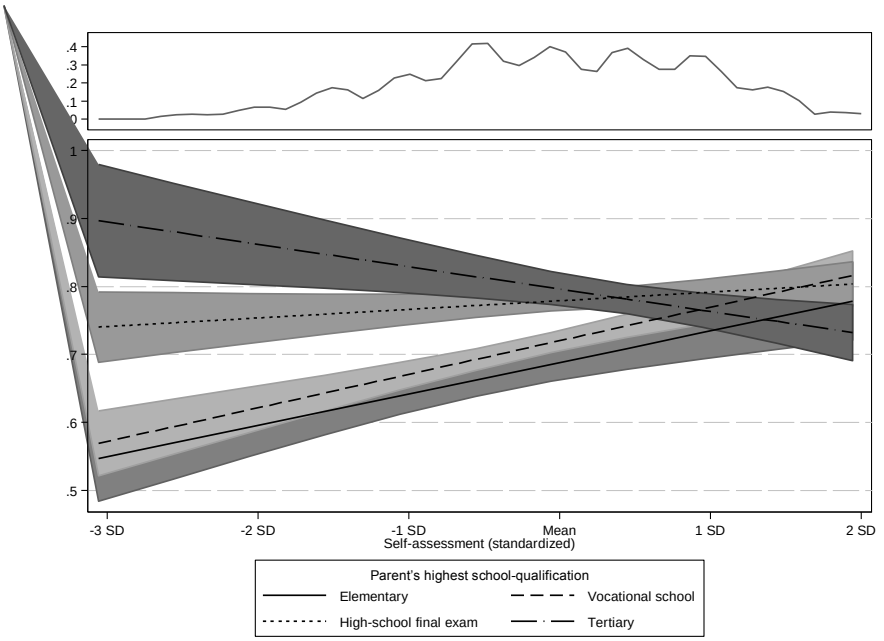


Figure 2: Different predictions of the choice of secondary school rather than vocational, according to parental background (based on Model 1 in Table 5)



Tables

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		Secondary school *versus* Vocational school	Sec. general school *versus* Sec. vocational school	State-financed tertiary *versus* No tertiary/not state-fin.
Elementary school	mean	46.60%	16.37%	10.18%
	sd	49.90%	37.03%	30.30%
	N	1206	562	226
Vocational school	mean	63.42%	23.30%	17.06%
	sd	48.17%	42.29%	37.64%
	N	2477	1571	885
High-school final exam	mean	84.81%	35.77%	28.44%
	sd	35.90%	47.94%	45.13%
	N	2614	2217	1466
Tertiary education	mean	95.05%	62.44%	49.05%
	sd	21.70%	48.45%	50.02%
	N	1434	1363	995
Total	mean	73.90%	36.79%	30.21%
	sd	43.92%	48.23%	45.92%
	N	7731	5713	3572

Table 2: Mean, standard deviation and number of cases of self-assessment and ability measures in 8th grade, by parental background

Parental background		Self-assessment	School Marks (PCA, 8th grade)		Competence Scores (PCA, 8th grade)	
			Individual	Class average	Individual	Class average
Elementary school	mean	-0.50	-0.40	-0.57	-0.34	-0.72
	sd	0.93	1.04	0.96	0.87	1.00
	N	1206	1206	1206	1206	1206
Vocational school	mean	-0.22	-0.20	-0.23	-0.19	-0.23
	sd	0.95	0.96	0.91	0.91	0.86
	N	2477	2477	2477	2477	2477
High-school final exam	mean	0.12	0.12	0.15	0.10	0.18
	sd	0.95	0.97	0.93	1.00	0.88
	N	2614	2614	2614	2614	2614
Tertiary education	mean	0.58	0.45	0.60	0.43	0.67
	sd	0.89	0.86	0.93	1.06	0.91
	N	1434	1434	1434	1434	1434
Total	mean	0.00	0.00	0.00	0.00	0.00
	sd	1.00	1.00	1.00	1.00	1.00
	N	7731	7731	7731	7731	7731
Gap	*mean*	1.07	0.85	1.17	0.78	1.39

Table 3: Explaining self-assessment, OLS coefficients with standard errors in parentheses

Number of model	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Self-assessment	Self-assessment	Self-assessment	Self-assessment	Self-assessment	Self-assessment
Parent's highest school qualification						
Elementary	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Vocational school	0.271***	0.180***	0.066**	0.074**	0.090***	0.049
	(0.033)	(0.029)	(0.029)	(0.031)	(0.030)	(0.031)
High-school final exam	0.621***	0.373***	0.145***	0.144***	0.157***	0.104***
	(0.033)	(0.029)	(0.030)	(0.033)	(0.032)	(0.034)
Tertiary	1.074***	0.655***	0.291***	0.282***	0.249***	0.175***
	(0.037)	(0.033)	(0.036)	(0.040)	(0.040)	(0.041)
School Marks (GPA)						
Individual		0.265***	0.296***	0.294***	0.255***	0.249***
		(0.012)	(0.012)	(0.013)	(0.014)	(0.014)
Class average			0.156***	0.174***	0.124***	0.118***
			(0.013)	(0.025)	(0.015)	(0.015)
Competence Score, PCA						
Individual		0.249***	0.258***	0.254***	0.220***	0.204***
		(0.012)	(0.012)	(0.013)	(0.013)	(0.013)
Class average			0.108***	0.095***	0.088***	0.076***
			(0.013)	(0.028)	(0.016)	(0.016)
Rotter's internal control						0.047***
						(0.010)
Harter's social competence scores						0.072***
						(0.021)
Rosenberg's self-esteem scale						0.225***
						(0.025)
Depression scale						-0.111**
						(0.045)
Other controls	No	No	No	No	No	Yes
School fixed effects	No	No	No	8th grade	9th grade	9th grade
Constant	-0.496***	-0.305***	-0.124***	-0.125***	-0.128***	-29.586
	(0.027)	(0.024)	(0.025)	(0.027)	(0.026)	(31.975)
Observations	7,731	7,731	7,731	7,731	7,731	7,731
Adjusted R-squared	0.121	0.319	0.366	0.439	0.383	0.414
F-stat	357.0	724.6	637.4	477.8	175.7	45.55

*** p<0.01, ** p<0.05, * p<0.1

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

Table 4: The explanation of educational choice, fixed effect OLS coefficients with standard errors in parentheses

	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)			State-financed tertiary (1) v. no/not state-f. (0)		
Self-assessment	0.031***	0.025***		0.058***	0.020***		0.049***	0.034***	
	(0.006)	(0.005)		(0.009)	(0.005)		(0.012)	(0.011)	
Parental schooling									
Elementary	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Vocational	0.069***	0.036***	0.037***	0.034	0.016	0.017	0.013	0.042	0.045
	(0.015)	(0.014)	(0.014)	(0.025)	(0.015)	(0.015)	(0.038)	(0.035)	(0.036)
High school	0.153***	0.100***	0.102***	0.082***	0.034**	0.036**	0.049	0.085**	0.089**
	(0.017)	(0.015)	(0.015)	(0.026)	(0.015)	(0.015)	(0.038)	(0.035)	(0.035)
Tertiary	0.140***	0.092***	0.096***	0.227***	0.072***	0.076***	0.158***	0.153***	0.160***
	(0.020)	(0.018)	(0.018)	(0.029)	(0.017)	(0.017)	(0.041)	(0.038)	(0.038)
School Marks									
Individual	0.117***	0.087***	0.093***	0.108***	0.030***	0.035***	0.106***	0.069***	0.080***
	(0.006)	(0.006)	(0.006)	(0.010)	(0.006)	(0.006)	(0.014)	(0.014)	(0.013)
Class average	0.058***	0.051***	0.054***	0.070***	0.013**	0.016***	0.027	0.018	0.023*
	(0.012)	(0.006)	(0.006)	(0.016)	(0.006)	(0.006)	(0.022)	(0.013)	(0.013)
Competence Score									
Individual	0.037***	0.028***	0.034***	0.058***	0.017***	0.021***	0.081***	0.059***	0.066***
	(0.006)	(0.006)	(0.006)	(0.008)	(0.005)	(0.005)	(0.011)	(0.011)	(0.010)
Class average	0.053***	0.028***	0.030***	0.032*	0.017***	0.018***	0.116***	0.073***	0.076***
	(0.013)	(0.007)	(0.007)	(0.018)	(0.006)	(0.006)	(0.024)	(0.013)	(0.013)
Rotter's internal	0.004	0.001	0.002	-0.003	0.004	0.005	0.008	0.008	0.010
control	(0.005)	(0.004)	(0.004)	(0.007)	(0.004)	(0.004)	(0.009)	(0.008)	(0.008)
Social competence	0.010	0.004	0.005	0.004	0.005	0.006	-0.027	-0.006	-0.004
	(0.011)	(0.009)	(0.009)	(0.014)	(0.008)	(0.008)	(0.019)	(0.017)	(0.017)
Self-esteem	0.036***	0.033***	0.039***	-0.002	-0.016	-0.012	0.010	0.029	0.036*
	(0.013)	(0.011)	(0.011)	(0.017)	(0.010)	(0.010)	(0.023)	(0.021)	(0.021)
Depression scale	0.023	0.033*	0.030	0.027	0.006	0.004	-0.010	0.013	0.008
	(0.022)	(0.020)	(0.020)	(0.031)	(0.018)	(0.018)	(0.043)	(0.040)	(0.040)
Graduated in 2011							-0.023	-0.055***	-0.054***
(reference: year 2010)							(0.018)	(0.018)	(0.018)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School fixed effects	8th grade	9th grade	9th grade	8th grade	9th grade	9th grade	8th grade	9th grade	9th grade

Constant	-47.300***	-40.946***	-41.689***	8.591	2.620	3.046	-13.851	-13.409	-13.375
	(15.750)	(13.938)	(13.959)	(23.747)	(13.794)	(13.817)	(33.424)	(30.339)	(30.389)
Observations	7,731	7,731	7,731	5,713	5,713	5,713	3,572	3,572	3,572
Adjusted R-squared	0.351	0.423	0.421	0.312	0.734	0.733	0.256	0.258	0.255
F-stat	62.75	23.04	22.99	40.63	6.183	5.877	24.07	7.224	7.131

*** p<0.01, ** p<0.05, * p<0.1

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

Table 5: Interactional effects, fixed effect OLS coefficients with standard errors in parentheses

Dependent variable	(1) Secondary school (1) versus vocational school (0)	(2) Sec. general school (1) versus sec. voc. school (0	(3) State-financed tertiary (1) versus no/not state-financed (0)
Self-assessment	0.046***	0.014	-0.021
	(0.011)	(0.012)	(0.034)
Parental schooling			
Elementary	Ref.	Ref.	Ref.
Vocational	0.032**	0.017	0.043
	(0.015)	(0.015)	(0.036)
High school	0.091***	0.037**	0.084**
	(0.016)	(0.015)	(0.036)
Tertiary	0.108***	0.080***	0.138***
	(0.019)	(0.017)	(0.039)
Self-assessment×Parental schooling			
Elementary	Ref.	Ref.	Ref.
Vocational	0.003	0.021	0.047
	(0.013)	(0.014)	(0.037)
High school	-0.034**	0.001	0.056
	(0.013)	(0.014)	(0.036)
Tertiary	-0.079***	-0.005	0.078**
	(0.016)	(0.015)	(0.038)
School Marks			
Individual	0.086***	0.029***	0.070***
	(0.006)	(0.006)	(0.014)
Class average	0.051***	0.014**	0.018
	(0.006)	(0.006)	(0.013)
Competence Score			
Individual	0.031***	0.017***	0.058***
	(0.006)	(0.005)	(0.011)
Class average	0.029***	0.017***	0.073***
	(0.007)	(0.006)	(0.013)
Rotter's internal control	0.001	0.004	0.008
	(0.004)	(0.004)	(0.008)
Social competence	0.002	0.004	-0.006
	(0.009)	(0.008)	(0.017)
Self-esteem	0.034***	-0.015	0.028
	(0.011)	(0.010)	(0.021)
Depression scale	0.032	0.006	0.012
	(0.020)	(0.018)	(0.040)
Graduated in 2011 (reference: year 2010)			-0.054***
			(0.018)
Constant	-38.186***	3.038	-12.552
	(13.909)	(13.796)	(30.347)
Other controls	Yes	Yes	Yes
School fixed effects	9th grade	9th grade	9th grade
Observations	7,731	5,713	3,572
Adjusted R-squared	0.426	0.734	0.258
F-stat	22.51	5.896	6.821

*** p<0.01, ** p<0.05, * p<0.1