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# COMPLETION OF UPPER SECONDARY EDUCATION: WHAT MECHANISMS ARE AT STAKE?

Martin D. Munk

## ABSTRACT

*The purpose of this chapter is to reveal explanations for completing upper secondary education. Focus is on the mechanisms that drive attainment of upper secondary education. I analyze the relative contributions of different factors measured by the relative increases in the log likelihood function. I also investigate the importance of characteristics other than the traditional variables, such as fathers' and mothers' occupations, their education, and household income, often applied in studies of educational attainment. I used a recent 1984 cohort database with information about educational completion and an informative set of measurements on noncognitive capacities, parental cultural capital, cultural capital, reading score, several school-related variables, and a rich set of family background variables. Attainment of upper secondary education was analyzed by a multinomial logit model, showing that characteristics other than the traditional variables all have significant importance. The analysis clearly depicted that the social position and educational levels of both parents remain important in determining whether the child embarks on completing an upper secondary education. Additionally, noncognitive dispositions*

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*show to be very important in explaining educational attainment, even when controlling for family background and refined cultural capital variables. Therefore, society should direct more efforts towards establishing children's cognitive and noncognitive skills and their ability to focus on schoolwork along with building their beliefs. Parents should be involved in a more content-sensitive sense when raising their children.*

**Keywords:** Educational completion; social origin; cultural capital; cognitive and noncognitive dispositions; and reproduction

## INTRODUCTION AND PURPOSE

The fundamental question of what determines the intergenerational transmission of advantage and disadvantage remains somewhat open, as stated in various references: Bourdieu (2000); Borghans, Duckworth, Heckman, and Weel (2008); Beller (2009); Björklund, Lindahl, and Lindquist (2010b). In particular, the role a person's origin plays in determining life chances is not fully understood. Here, rather than concentrating on traditional family background variables to explain educational outcomes, I search for the explanation in characteristics, dispositions, and attributes. I believe that focusing on the details of what individuals were exposed to and experienced, in both the home and the school, when growing up will further our understanding of the role played by the traditional parental characteristics and will add new insight into what constitutes the carriers of characteristics from one generation to the next. I also assume that various forms of capital are accumulated and produced throughout a person's lifetime, especially during childhood, and that these forms of capital are mainly determined by the characteristics of the family in which the individual grows up (Dumais & Ward, 2010; Wildhagen, 2010).

First, I analyze whether cultural capital, school variables, cognitive skills and noncognitive skills (system of dispositions) simultaneously have a statistically significant impact on completion of upper secondary education after controlling for family background. Focus is on the degree to which noncognitive traits matter for educational success because soft skills are important for educational and other outcomes (Heckman, Stixrud, & Urzua, 2006). Therefore, I expect that items other than traditional family background characteristics matter. Influence could well be exerted by self-perception, locus of control, cultural orientation, taste for education or

“educational affinity,” teacher–student relationship and “school non-cognitive climate,” which may sway the particular completion of an upper secondary school program (e.g., Goldthorpe, 2007, p. 13). In terms of the teacher–student relationship I introduce and use the item “Most of my teachers really listen to what I have to say” and capture some kind of recognition contributing to building up self-confidence and self-esteem (Bourdieu, 2000; DiMaggio, 1982; Dumais, 2006). It remains controversial whether cultural capital, in addition to social origin and other characteristics, is the driver of educational success (Kingston, 2001; Goldthorpe, 2007; Gaddis, 2013). Therefore, I use various measures of parental cultural capital and cultural capital variables to further test the degree to which cultural capital matters in educational attainment. The first dimension of cultural capital is usually missing in educational attainment studies, and I offer a measurement of this by introducing the formulation from the PISA study: “I cannot sit still and read for more than a few minutes.” It is relevant to have such a category since it can capture a characteristic – not being able to sit still and read – that would probably make it unlikely that a high-school education was completed or even initiated. Goldthorpe (2007, p. 3) argues that for children from working-class or peasant origins, the school represents an alien environment, especially if the child is unable to meet the demands of school, including the ability to sit still and read for extended periods. Following Farkas (2003), I would argue that cultural capital is much broader than merely high-status culture signals.

Second and most importantly, the study aims to analyze the importance, or magnitude of effects, of these variables compared with the effects of family background. I use an idea from McIntosh and Munk (2007) where we look at the incremental increase in the likelihood function as each group of variables is included in the model of educational attainment. The objective is to determine the relative contributions of inherited and noninherited (acquired) attributes and characteristics in completing upper secondary education following the work of Breen and Goldthorpe (1997), Dustmann (2004), Erikson and Jonsson (1996), Erikson and Rudolphi (2010), Galindo-Rueda and Vignoles (2007), Gamoran and Mare (1989), Halsey, Heath, and Ridge (1980), Iannelli and Raffe (2007), Micklewright (1989), McIntosh and Munk (2007), Rudolphi (2011), and others. In particular, focus is on the explanation for completing different types of upper secondary education some eight years after leaving lower secondary education. I use a unique database of combined Danish administrative registers and survey information from PISA data 2000. The idea is to use information about the family background and school as being the places

where a major part of the system of dispositions is created since this is assumed to have a marked influence on educational attainment.

The following section gives a literature review and elements of the theoretical foundation. I start by looking at social origin characteristics and then go on to give a thorough description of noncognitive and cognitive dispositions followed by a discussion of how to measure parental cultural capital and cultural capital; I end by formulating the two research hypotheses. This leads to the third section where I describe and discuss the applied data, variables and method. Findings and results from the statistical analysis of completion of upper secondary education are then presented and evaluated in the fourth section. In the final section, I discuss the results and conclude.

## LITERATURE AND THEORETICAL BACKGROUND

The social and economic circumstances in which children grow up are crucial in determining children's outcomes as adults and play a major role in the attainment of education (Haveman & Wolfe, 1995). An early example of this research is Sewell, Haller, and Portes (1969), who looked beyond father's and mother's income and education and examined the roles of psychological and social psychological variables, such as measured mental ability and social capacity, as well as variables such as level of educational aspiration. Further, they discussed a possible mediator such as an individual's self-conception of ability. In their study, they explained 50% of the variation in the level of educational attainment. Micklewright's (1989) analysis of the National Child Development Study also supports the finding that social background has a major impact on educational completion, even when controlled for academic ability. Between half and two-thirds of educational success is explained by social background. Examples of educational attainment studies after 1995 are those of Dearden, Machin, and Reed (1997) and Dearden (1999). They found that father's years of education, mother's years of education, birth order, type of school, father's occupation, and the financial state of the household were significant in explaining completed years of school for both sexes. Like many other studies, they found that mother's education is more important than that of the father, even when scores from both verbal and mathematical ability tests are included as regressors. The possible effect of the mother's education was considered by Sewell and Shah as early as in 1968, despite the father's education being relatively more important at that time. Ermisch and

Francesconi (2001) found a strong relationship between parental educational attainment and the educational attainment of young cohorts and, in particular, individuals from the bottom income quartile showed to have much lower educational attainments. However, Behrman and Rosenzweig (2005) questioned whether there was a true causal relationship between mother's schooling and her child's schooling, which they found was not sufficiently robust to control for unmeasured, intergenerationally correlated endowments, while a positive effect of paternal schooling was robust. The intergenerational effects of changes in mother's education are rearticulated in Mare and Maralani (2006), who found a positive effect; however, the cost was a reduction in the overall number of children that a more educated population of women bears. A recent paper by Beller (2009) stresses the importance of including mother's social class (occupation) in explaining social mobility. It means that both mother's education and occupation should be part of the empirical model, and as Weeden and Grusky (2005) and McIntosh and Munk (2009) showed, it is better to use the actual occupations of the parents rather than a crude class measure.

Characteristics such as age, number of siblings and sex also play a possible role and other variables matter too, for example, school happiness (see Layard, 2005 for a definition of happiness). Girls are now doing much better in the educational system than boys are. Various international studies support this, and in a review of research in the area, Buchmann, DiPrete, and McDaniel (2008) overwhelmingly show that girls simply perform differently and are apparently better able to adapt to a world of academic education.

Without data on the details of time and expenditure allocations within the household, it is difficult to distinguish between the benefits that accrue to children through the actual investment process and those that depend on the quality of the parent as represented by his or her characteristics (Teachman, 1987) and applicable references (e.g., Leibowitz, 1974). Nevertheless, parents are involved as mentors and as providers of some of the resources required for the particular action chosen. I use information about how often the mother had helped with schoolwork during the time her child attended lower secondary school. Clearly, frequent help from the parents indicates that the child at age 15–16 has some difficulties with schoolwork or other areas; however, it is expected that some minimum time and involvement from the parents contributes positively to a better performance. I address this issue further when describing parental cultural capital. The fast growing literature on intergenerational causal effects is relevant (Holmlund, Lindahl, & Plug, 2011), and there is increasing focus on parental

involvement. As an example, Björklund, Eriksson, and Jäntti (2010a) used the sibling correlation, rather than the parent–child correlation, as an estimate of the strength of the intergenerational association. They found that only about 13% of the variation in son’s test score could be accounted for by father’s test score, whereas the share was about 50% when using the sibling test score. This suggests that parental aspirations, attitudes and parenting practices may be important in accounting for the child’s performance (Björklund et al., 2010a, p. 8; see also Björklund et al., 2010b), leaving open the role of parental genetic characteristics.<sup>1</sup> All in all it seems reasonable to look for additional family factors and characteristics.

### *Cognitive and Noncognitive Dispositions and Skills*

As resources are clearly inherited, researchers have focused on the role of inheritance of parents’ ability in this process, as suggested by Savage and Egerton (1997), for instance. While the dimension of ability is important because actual skills are determined to some degree by ability, concepts such as ability and intelligence quotient (IQ) are seen as controversial in the literature (Borghans et al., 2008; Loehlin, 2005 in Bowles, Gintis, & Osborne Groves, 2005; Nash, 2003; McIntosh & Munk, 2013). One of the results emerging from the debate between the psychologist Piaget and the linguist Chomsky was that they attributed both cultural and structural–biological dimensions to ability and concluded that ability was related to both experience and a generative IQ (see, e.g., Piattelli-Palmarini, 1980). Accordingly, it is important to address both cognitive and noncognitive elements. Both dimensions are relatively well articulated in recent sociological, economic and psychological literature. Introducing the sociological concept of habitus is useful because its definition as a system of dispositions<sup>2</sup> contains both cognitive and noncognitive elements. Bourdieu understands habitus as a generating principle of behavior and possibilities; and habitus affects individuals’ estimations of the probability of the success of particular outcomes and represents an individual’s disposition that stems from his or her standing in the game or his or her “feel for the game” (Bourdieu, 2000).

Although there is some criticism of the concept, for example, by Devine, who claims that Bourdieu’s “account of the inculcation or internalization of the habitus is not well specified so that the processes by which cultural capital is mobilized across generations remains something of a black box” (Devine, 1998, p. 31), it is a reasonable concept to address the relationship between parents’ investments, transmissions of cultural capital and other

resources, and their children's future life chances (Bourdieu, 1984, 2000; Munk, 2003; Sayer, 2005; see also Breiger, 1995; Bennett et al., 2009; Wildhagen, 2010). How is this relationship constituted? In one of his last pieces, *Pascalien Meditations*, Bourdieu states that the principle of habitus is embedded in a complex process produced through a socialization motor, termed the search for recognition,<sup>3</sup> requiring an inculcation of the durable disposition to invest in the social game, which is one of the prerequisites of all learning, pedagogic work in its elementary form. It means that throughout childhood and adolescence every individual can obtain durable dispositions through a search for recognition, but with unequal starting points, and is then possibly able to investment in social arenas, such as education. It is claimed by Lizardo (2004, p. 395) that habitus consists of a sociologized version of Piaget's views of practical cognition, termed cognitive dispositions (p. 381). As Nash (2003, p. 446) puts it: "To speak of cognitive habitus is not to encode IQ theory in a radical discourse, but to draw attention to the relationship between classed environments and schemes of language, thought, and modes of specialized cognition."

The noncognitive part of the system of dispositions is often termed noncognitive dispositions or sometimes called noncognitive traits (Bowles, Gintis, & Osborne, 2001, Bowles et al., 2005; Farkas, 2003; esp. Osborne-Groves, 2005, p. 211). In three pieces, Borghans et al., (2008), Thiel and Thomsen (2011), and DiPrete and Jennings (2012) review early and new studies of noncognitive skills, now sometimes termed social and behavioral skills, and describe them at length. According to Borghans et al. (2008), Bowles and Gintis (1976) were the first to introduce the concept of noncognitive (personal) traits. In my view, Bourdieu was also trying to address similar or maybe even more profound items through his concept of system of dispositions or habitus, originally focusing on primary socialization, but later also on studying secondary socialization. To sum up these studies, we can expect that some of the variation in educational attainment, based on choices after lower secondary education, is due to noncognitive dispositions. Noncognitive elements include reliability, punctuality, drive, tolerance, belief structure, behavioral "traits," as Bowles et al. (2001) term them. A review by Farkas (2003) lists a number of items that could capture important aspects of noncognitive elements. He includes effort (industriousness and perseverance), spelling, capitalization, organization, discipline, attendance, participation, and enthusiasm; he also mentions leadership, sociability (extraversion), self-confidence, social sensitivity, impulsiveness, openness to experience, emotional stability (calmness), vigor, aggressiveness, disruptiveness, high culture, locus of control, and self-esteem. In a



sense, part of the noncognitive dispositions was already introduced in an early educational attainment study by applying the concept of educational aspirations, which focused on the desire to continue in the educational system (Sewell & Shah, 1968). However, Farkas (2003, p. 542) notes that: "Prior status-attainment models such as the Wisconsin model (Sewell & Hauser, 1975) incorporate social-psychological factors in addition to cognitive skills and yet completely ignore noncognitive behaviors." However, previous status-attainment studies did consider noncognitive behaviors when explaining educational outcomes, for example, Jencks et al. (1979, Chs. 4, 5) and especially Mueser (1979). Possibly, the literature is slightly ambiguous regarding the relationship between educational aspirations and noncognitive skills, but it seems that drive and ambition are part of both concepts. An empirical test of this idea is found in Dumais (2002) using the American National Educational Longitudinal Study. Her empirical notion of habitus is "occupational aspiration" (p. 50), which in my view, only partly measures habitus; a later use is "expectations of the parents" to measure parental habitus (Dumais, 2006). Although Farkas (2003, p. 547) suggests that the respondent's habitus may partly be influenced by parental habitus, these analyzes do not have a full measurement of parental habitus. In the analysis, I use information about parental cultural capital (see next paragraph).

To conclude, the combined cognitive and noncognitive habitus thus refers to capacities and capabilities of the body and mind to perform the kind of abstract problem-solving exercised in language-based and symbolic information processing. This is relevant for educational choice after lower secondary education and the completion of upper secondary education since most social science researchers assume that the production of noncognitive dispositions takes place before the age of 20 years (Borghans et al., 2008; Heckman, 2006).

### *Cultural Capital*

I subscribe to the view that the capital accumulation process has a cultural dimension that can be understood only in the appropriate context, that is, both the household in which the child resided when the major possible investments in cultural capital were made and the educational setting, such as the school and surroundings. I am thus in line with Aschaffenburg and Maas (1997), Bourdieu (1986, 2000), Bourdieu and Passeron (1990), Bowles et al. (2001), De Graaf and Kalmijn (2000), Farkas (2003), Sullivan (2001),

Lareau and Weininger (2004), Wildhagen (2009, 2010), and Jæger (2009, 2011). Notions of cultural capital, as represented by household cultural activities, or parental involvement, are explored by De Graaf et al. (2000).

With reference to DiMaggio (1982), Teachman (1987, p. 548) argued that “cultural capital is only moderately related to conventional measures of family background (especially education of the parents).” Teachman proposes that “cultural capital is an element of status culture distinct from class position,” but since he does not include other measurements of cultural capital, apart from parents’ education, occupational status of the parents, and an index of educational resources, his analysis can give only a moderate measurement of the effect of parents’ cultural capital on educational outcome. Kastillis and Rubinson (1990, p. 270) define cultural capital as “competence in a society’s high status culture,” but in their operationalization they limit parents’ education to a traditional measurement of SES and instead employ an index of attendance to theaters and lectures and visits to museums. However, to omit parents’ education from the notion and measurement of cultural capital, as these authors do, is inappropriate (see, e.g., Goldthorpe, 2007; Lareau & Weininger, 2004, p. 4). The problem in Kastillis and Rubinson’s study (1990) is that there is too much emphasis on participation in high-status culture instead of viewing cultural capital as an encompassing set of resources that entrains a certain kind of habitus (see also Wildhagen, 2010). Note that Sullivan (2001) equates cultural capital with lifestyles, mirroring what DiMaggio had in mind some 30 years ago (1982, 1985 with Mohr). However, Sullivan (2007) later advocates that cultural capital is also educational capital, similar to the argument of Bourdieu (1986) and Lareau and Weininger (2004). Nevertheless, it should be underlined that cultural tastes and knowledge become capital only when these attributes become criteria for determining success within a particular field (Wildhagen, 2010, p. 521).

Although Jæger (2009) elaborates substantially on the specific levels and mechanisms encapsulated by the “black box” of cultural capital, he still measures parental cultural capital by possession of beaux arts items (classic literature, books of poetry, and works of art) and home educational resources (dictionary, a quiet place to study, a desk for study, and textbooks). Then Jæger measures child’s cultural capital by participation in highbrow activities (visits to art museums and theatres and listening to classical music), distinguished from his or her academic abilities approximated by the same reading score as we use. Wildhagen (2009) casts doubt on the commonly accepted thesis, also found in Bourdieu, that cultural capital (as measured by cultural classes outside school and attending museums)

improves the teacher–child relationship and thus academic performance (measured as grades and test scores). Although she finds an independent, significant effect of cultural capital and of teacher’s perception of the respondent (measured as attentiveness in class, homework effort, and effort in class) on academic performance, she does not find an effect of cultural capital on teacher’s perception. Instead, the indirect effect of cultural capital is related to self-selection through educational expectations.

Since these studies have had some success with cultural capital variables, our model’s ability to explain the data would be improved if similar variables were included. We have information on household cultural activities – for instance, involving the child in discussions on politics and social issues, used to capture parental involvement – and number of books at home, and also on whether the child visits museums or art galleries. The first dimension of cultural capital, embodied dispositions, captures incorporated mindset and body knowledge, personalities, and mannerisms (Bourdieu, 1986; Wildhagen, 2010), usually missing in educational attainment studies, is introduced by a variable indicating whether the child cannot sit still and read. Since this dimension is an alias for a part of habitus, it reasonable to equate it with noncognitive dispositions.

Educational success is assumed to be related to how the teachers recognize and perceive the student. Farkas is precise when he understands cultural capital to be much broader than merely high-status culture signals. An early, classic contribution in this tradition was DiMaggio (1982, p. 190), who tried to operationalize cultural capital in explaining educational performance. He wrote that: “According to Bourdieu, schools reward students on the basis of their cultural capital, defined as: instruments for the appropriation of symbolic wealth socially designated as worthy of being sought and possessed. Teachers, it is argued, communicate more easily with students who participate in elite status cultures, give them more attention and special assistance, and perceive them as more intelligent or gifted than students who lack cultural capital.” As a result of these studies, I used information about the recognition of the student (see also Bourdieu, 2000; Bourdieu & Passeron, 1990). Other related school features, such as discipline in the class room, are included to discover whether the students come from weak school environments, which ultimately matters. Bourdieu (1986) states that the initial accumulation of cultural capital, the precondition for the fast, easy accumulation of every kind of useful cultural capital, starts at the outset, without delay, without wasted time, only for the offspring of families endowed with strong cultural capital; in this case, the accumulation period covers the whole period of socialization.

### Research Hypotheses and Assumptions

The research hypotheses are therefore that apart from dominant family background, other variables are important in explaining educational completion, and that measures of noncognitive and cognitive dispositions and cultural capital should also be included in the model to test whether cultural capital, school variables, cognitive skills, and noncognitive skills have a statistically significant effect on educational attainment after controlling for family background. In addition, I assume that these items differ in importance in such a way that cultural capital and school variables are less important and noncognitive and cognitive abilities are more important. Focus is on the degree to which noncognitive traits matter for educational success because various studies have shown that soft skills are important for both educational and labor market outcomes (Heckman, Stixrud, & Urzua, 2006). Accordingly, information about different self-concepts, locus of control, self-esteem and beliefs is used, all characteristics that indicate important features of habitus (Bourdieu, 2000). Even though some studies have found weak effects of cultural capital on educational attainment (Gaddis, 2013; Jæger, 2011; Wildhagen, 2010, p. 523), it is expected that including more refined variables will add to the explanation of educational success.

## DATA, VARIABLES, AND METHOD

The dataset used in the empirical analysis is a combination of the Danish part of the 2000 OECD Program for International Student Assessment (PISA) survey and an extensive number of Danish register data from Statistics Denmark for the individuals in question, their parents, and siblings for the years 2000 and 2008.

I use a sample of 3,941 individuals born in 1984 who participated in the PISA survey. The sample is nationally representative of 15 years olds in education. PISA 2000 used a two-stage stratified sample design, where the first-stage sampling units are schools and the second-stage sampling units are students within the sampled schools, see OECD (2002a) and Jensen and Andersen (2006) for a detailed description of the PISA survey. Because of unobserved educational status in 2008, 120 observations were dropped.

To reduce the number of missing observations, categories for unknown/missing values were included in the regression. The final sample consists of 3,821 observations.

The dependent variable in our study is a four-category variable for completed secondary education in 2008, that is, eight years after lower secondary education, focusing on a point in time when most young people have completed upper secondary education and not at different stages in time.<sup>4</sup> The four categories of the dependent variable are no youth education, academic high school,<sup>5</sup> technical or business high school, and vocational education. In Denmark, primary education or lower secondary education incorporating grade nine is compulsory; however, approximately 60% of children continue to grade ten at the age of 16 years. After grade nine or ten, there are two further educational choices at the upper secondary level in addition to not continuing at all.

The individual can elect to enroll in a vocational program – welding, carpentry, or hair dressing are typical options. Vocational programs can be lengthy and involve apprenticeships lasting up to four years. High schools, the other option for continuing at the upper secondary level, offer three types of curriculum: a general program with various theoretical programs in the humanities, natural, and social sciences; a technical program; and a business program. After grade nine or ten, students can enroll in these programs, which typically last three years and provide the qualifications required for university admission. Many short or intermediate tertiary educational programs also require a high-school diploma for entry. In the data set here, an individual is in the designated category provided he or she had completed the program associated with it.

The vast majority (94.5%) of the students had completed their secondary education by 2008.<sup>6</sup> Only 209 had still to complete upper secondary education, but since it was very few, it did not harm the estimates; most of those with unfinished upper secondary education were enrolled in the vocational program (185). I omitted the 209 individuals from the reference group to avoid heterogeneity. To test this choice of grouping, I ran a model with the 209 in the reference group so that the response variable was solely composed of those completing upper secondary education. The results gave the same overall view, except for minor changes in a few estimates. The distance between reference group and the completed group then decreased because those now inserted in the first group were de facto enrolled in upper secondary programs and were more alike the vocational outcome category.

*Explanatory Variables*

Two sets of explanatory variables are used in the analysis: register variables and PISA-survey variables. These are categorized according to the type of effect I attempted to capture. All variables were recoded on the basis of numerous preliminary, alternative model specifications.

The register variables are based on register data from 2000, unless otherwise specified. A series of dummy variables was used to control for family and individual background differences: female: specifying sex; urban: capturing all individuals living in either Copenhagen or Aarhus; nuclear family: all individuals living with both parents in 2000. A variable for number of siblings in 2000 was included from the PISA survey. All family background variables were measured when the respondent was 15–16 years old.

Some specifications of the household include parents' occupations and educations, and specifications of the capital of the individuals include cognitive functioning, other individual attributes and noncognitive dispositions. The latter soft attributes are believed to be very important for a person's capability.

Family income is measured as the combined gross income of parents divided by 100,000 DKK. To avoid extreme observations, the highest and lowest 1% observations are set equal to the 1% and 99% percentiles, respectively. Parental education is measured by categorical variables with 5 categories: primary school, high school, vocational education, short or intermediate college education, university education, and a final category is used for unknown. A categorical variable for occupational position is used for each parent. Fathers' occupations are measured by 11 categories<sup>7</sup>: (i) unskilled workers; (ii) skilled craft workers and machine operators; (iii) skilled agricultural/fishery workers; (iv) clerks and sales, service and care work; sales, finance and business administration; (v) technicians and intermediate professionals; (vi) professionals – arts and social sciences; (vii) teaching professionals; (viii) science professionals; (ix) managers; (x) legislators, senior officials; and (xi) unknown. Mothers' occupations are measured by 10 categories: (i) unskilled workers; (ii) skilled craft workers and machine operators; skilled agricultural/fishery workers; sales, service, and care work; (iii) clerks; (iv) sales, finance, and business administration; (v) technicians and intermediate professionals; (vi) professionals – arts and social sciences; (vii) teaching professionals; (viii) science professionals; (ix) managers, legislators, senior officials; and (x) unknown.

The PISA survey explanatory variables are split into four groups according to the effects they are to capture (see Appendix Table A.1 for

the complete list of PISA explanatory variables): Group 1: parental cultural capital and cultural capital; Group 2: school; Group 3: noncognitive skills; and Group 4: cognitive skills. Parental involvement (parental cultural capital) is partly captured by the variable how often the parents discuss politics and social issues with the child.<sup>8</sup> This item is included in the analysis to indicate whether the child benefits from discussions with his or her parents. It is likely that this type of parental involvement will positively influence the likelihood of obtaining a high-school diploma. The number of books at home in 2000 (99% of the students live at home) is also included as a measurement of parental cultural capital. Yet another parental involvement variable is used to encapsulate the degree to which a mother spent time on schoolwork with her child.

Cultural capital is measured by the two variables: Whether the student had visited museums or art galleries several times in the past year and whether the student cannot sit still and read for more than a few minutes. The latter important first dimension of cultural capital, embodied individual dispositions and competencies, is taken into account to capture a possible negative feature. Normally, an accumulative positive variable would be applied. However, it is relevant to have such a category since it captures a characteristic that would probably make it unlikely that a high-school education was completed or even initiated. Goldthorpe (2007, p. 3) argues that for children from working-class or peasant origins the school represents an alien, and indeed a hostile, environment, especially if the child is unable to meet the demands of school, including the ability to sit still and read for extended periods. Two school-related variables are used: "Students don't start working for a long time after the lesson begins" is a dummy variable measuring the student's own impression of class discipline. The other dummy variable: "Most of my teachers really listen to what I have to say" captures whether the student feels the teachers listens to what he or she has to say, thereby resembling some kind of recognition contributing to building up self-confidence and even self-esteem.

The noncognitive dispositions are captured by a number of variables: "If I decide not to get any bad grades, I can really do it." This variable captures one component of locus of control. Locus of control individuals with a high internal locus of control believe that events result primarily from their own behavior and actions (Borghans et al., 2008; Piatek & Pinger, 2010). Those with a high external locus of control believe that powerful others, fate, or chance primarily determine events. Yet another item is when studying: "When studying, I keep working even if the material is difficult," entailing

some aspects of effort (and self-efficacy), which we know plays an important role, recently confirmed in a British-Italian study (Fraja, Oliveira, & Zanchi, 2010). Self-efficacy corresponds to an individual's belief in his or her own competence and is usually defined as the belief that one is capable of performing in a certain manner to attain certain goals. Also, we included: "I like to try to be better than other students," which measures competitiveness and sociability (extraversion).

More variables include: "I'm hopeless in Danish language classes," aiming for a negative self-esteem item in order to have a negative evaluation of the self, measuring how the student feels about herself or himself and underlining what Bourdieu conceptualizes as a negative lingual self-devaluation of students from nonacademic homes. Less-privileged students are influenced by a "cooling out" process in which they view their failures in school as their own fault and thus select themselves out of the competition for educational success (Bourdieu, 1984; Wildhagen, 2010, p. 525). Other variables are: "I have always done well in mathematics," which is a way to include a self-concept – what an individual thinks about the self; and: "When I study, I try to figure out which concepts I still haven't really understood," which captures control strategies (self-regulation cf. Borghans et al., 2008).

As suggested in the literature (Boudon, 1974), I focus on the effects of educational attainment, net of cognitive achievement (i.e., primary effects). A measurement of a reading score is therefore included to deal with cognitive dispositions.<sup>9</sup> The reading score has been normalized to mean 0 and standard deviation 1. The math and science tests were not included because both were answered by only one-third of the selected PISA students in Denmark.

### *Statistical Method*

Completion of upper secondary education is modeled with a multinomial logit model, see, for example, Wooldridge (2010). Let  $y_i$  denote a random variable taking on values  $j \in \{0,1,2,3\}$  and let  $x_i$  denote the set of conditioning variables containing variables such as sex and parental education. I want to estimate the response probabilities for each alternative conditional on a number of characteristics  $x_i$ . The response probabilities are

$$P(y_i = j|x_i) = P_{ij} = \frac{\exp(x_i\beta_j)}{1 + \sum_{k=1}^J \exp(x_i\beta_k)}, \quad j = 1, 2, 3$$



where  $\beta_j$  is a  $K \times 1$  vector of parameters related to the  $j$ 'th alternative. The parameters are estimated by maximum likelihood. The ratio of the choice probabilities for alternatives  $j$  and  $l$ , relative risk ratios (RRR), is

$$\frac{P_{ij}}{P_{il}} = \exp(x_i(\beta_j - \beta_l))$$

We see that the RRR of alternatives  $j$  and  $l$  does not depend on any alternatives other than  $j$  and  $l$ . This property, also known as the Independence of Irrelevant Alternatives, is usually considered restrictive. However, the IIA assumption cannot be rejected by the Hausman–McFadden test and Small-Hsiao test, as implemented in Stata. The two-stage sampling design is taken into account by employing the final student weights provided by the OECD, see OECD (2002a) for details, and the clustering of students within schools is dealt with by computing cluster-adjusted robust standard errors, as implemented in Stata version 10.5.

## FINDINGS

### *Descriptive Statistics*

Using Tables 1 and 2 we can summarize the upper secondary education completion choice difference between two generations. The difference in intergenerational education choice shows that all four categories (no youth education, academic high school, business/technical high school, vocational education) are different. The percentage of no youth education after finishing basic education has dropped in the children's generation to 18%. Fewer children attend vocational school compared with their parents. Of those not attending vocational schools, there is an increase in the percentage completing high school.

In total, almost 60% of children pursue high school. This pattern probably stems from a high-school diploma being a prerequisite for admission to tertiary education. Both tables show similar figures in terms of how parents' educational level affects their children's. When I compare the percentages of each column in both Tables 1 and 2, academic high school is the highest for all the categories of parental education, except no youth education. While about 25% of children whose father or mother had no further education also had no further education, around 40–50% of children whose parents attended high school also attended high school.

**Table 1.** Completion of Upper Secondary Education by Father's Highest Completed Education.

Father's Highest Completed Education (Row Pct.)	No Youth Education	Academic High School	Business/Technical High School	Vocational Education	No. of Observations	Total Percentile
No further education	28	24	15	32	904	24
High school	15	50	27	8	116	3
Vocational education	16	31	23	30	1,503	39
Short/intermediate higher education	11	53	21	16	659	17
Long higher education	7	76	12	5	342	9
Unknown	30	34	14	21	297	8
No. of observations	698	1,457	732	934	3,821	
Total percentile	18	38	19	24		100

**Table 2.** Completion of Upper Secondary Education by Mother's Highest Completed Education.

Mother's Highest Completed Education (Row Percentile.)	No Youth Education	Academic High School	Business/Technical High School	Vocational Education	No. of Observations	Total Percentile
No further education	25	23	17	35	1,182	31
High school	19	41	25	15	150	4
Vocational education	18	31	24	27	1,162	30
Short/intermediate higher education	10	58	18	14	992	26
Long higher education	6	85	5	4	154	4
Unknown	29	34	13	24	180	5
No. of observations	698	1,457	732	934	3,821	
Total percentile	18	38	19	24		100

Parents' highest education has a different effect on children's completion of education.

To compare the children's completion of high school among parents' different backgrounds, the highest rate is parents' with long higher education. More specifically, when the mothers' final education is a long higher education, then 85% of their children choose to complete high school, which is in line with other researchers finding (Buchmann et al., 2008; Legewie & DiPrete, 2012). The rate decreases as the level of mother's education changes to short intermediate higher education and high-school graduates. Children's attainment of vocational education tends to be strongly influenced by their parents.

A comparison of the different influences of parent's highest attained education on children's educational completion shows that the mother's short/intermediate and long academic education has a slightly bigger impact on children's completion of high school than does the father's level of education.

#### *Multinomial Logit Analysis*

Table 3 shows the regression results with completion of upper secondary education as the dependent variable. The baseline group used for comparison is the "no youth education" group. For each covariate a RRR is shown.

The results were more significant for the high school and business/technical high-school outcomes than for the vocational education outcome. This suggests that the distance to the reference group is larger for the high-school group than for the group of vocational education. Noncognitive dispositions have significant effects on students' attainment of upper secondary educational programs, especially high-school tracks, even after controlling for traditional family background. The magnitudes of these variables are discussed further in the analysis of Table 4. The item: "If I decide not to get any bad grades, I can really do it" matters a great deal for completing high school and shows that some students have a high locus of control and self-confidence in academic and other skills required to deal with challenges encountered in school. Another item: "I have always done well in mathematics," stands out, especially for technical high school, which is not surprising since people who perceive themselves as being skilled in mathematics tend to favor high schools offering natural and technical science programs. Having a strong belief about competencies in

**Table 3.** Completion of Upper Secondary Education – Multinomial Logit (Ref.: No Youth Education).

	Relative Risk Ratios ( <i>p</i> -values)		
	Academic High School	Business/ Technical High School	Vocational Education
Female	3.03 (0.00)***	1.39 (0.01)*	0.69 (0.00)**
Urban (Copenhagen and Aarhus)	0.71 (0.03)*	0.53 (0.00)**	0.65 (0.00)***
Nonwestern immigrant	2.10 (0.02)*	1.47 (0.25)	0.46 (0.00)**
Nuclear family	1.35 (0.12)	1.48 (0.05)*	1.51 (0.01)*
Number of siblings	0.98 (0.67)	0.91 (0.08)	0.98 (0.55)
Father's age	1.01 (0.43)	1.01 (0.38)	1.00 (0.84)
Mother's age	1.06 (0.00)***	1.03 (0.12)	1.02 (0.17)
Family income (1,00,000 DKK)	1.12 (0.00)***	1.12 (0.00)**	1.05 (0.18)
Father's occupation (ref: unskilled workers)			
Machine workers and skilled craft workers	1.22 (0.32)	1.23 (0.30)	1.00 (0.99)
Skilled agricultural and fishery workers	1.05 (0.88)	1.02 (0.95)	1.41 (0.31)
Sales, service and care work and clerks, sales, finance and business administration	1.66 (0.05)*	1.44 (0.19)	1.13 (0.61)
Technicians and associate professionals	2.02 (0.03)*	1.08 (0.84)	0.73 (0.35)
Professionals – arts and social sciences	6.03 (0.00)**	3.25 (0.05)*	1.26 (0.69)
Teaching professionals	1.49 (0.32)	0.58 (0.22)	0.46 (0.09)
Science professionals	1.23 (0.61)	0.80 (0.63)	0.77 (0.50)
Managers	2.03 (0.10)	2.02 (0.06)	2.00 (0.06)
Legislators and senior officials	1.97 (0.10)	1.72 (0.18)	1.06 (0.89)
Mother's occupation (ref: unskilled workers)			
Machine workers, skilled craft workers, skilled agricultural/fishery workers, sales, service, and care work	0.92 (0.70)	0.84 (0.46)	0.98 (0.90)
Clerks	1.45 (0.17)	1.41 (0.22)	0.98 (0.93)
Sales, finance, and business administration	1.74 (0.11)	1.39 (0.40)	0.84 (0.61)
Technicians and associate professionals	1.68 (0.09)	1.35 (0.39)	0.91 (0.74)
Professionals – arts and social sciences	1.71 (0.26)	1.46 (0.43)	0.94 (0.88)
Teaching professionals	3.70 (0.00)**	2.61 (0.03)*	0.97 (0.94)
Science professionals	1.19 (0.77)	0.74 (0.63)	0.71 (0.56)
Managers, legislators and senior officials	1.12 (0.78)	1.20 (0.70)	0.96 (0.94)
Father's education (ref: Elementary school)			
High school education	1.82 (0.14)	2.76 (0.02)*	0.54 (0.18)
Vocational education	1.57 (0.00)**	1.88 (0.00)***	1.55 (0.00)**

Table 3. (Continued)

	Relative Risk Ratios ( <i>p</i> -values)		
	Academic High School	Business/ Technical High School	Vocational Education
Short/medium higher education	1.75 (0.01)*	2.05 (0.00)**	1.45 (0.09)
Long higher education	2.10 (0.05)*	1.36 (0.47)	0.79 (0.60)
Mother's education (ref: Elementary school)			
High school education	1.33 (0.42)	1.21 (0.61)	0.66 (0.23)
Vocational education	1.63 (0.00)**	1.68 (0.00)***	0.99 (0.92)
Short/medium higher education	1.69 (0.03)*	1.11 (0.71)	0.93 (0.72)
Long higher education	3.04 (0.03)*	0.56 (0.39)	0.54 (0.31)
Parents discuss politics or social issues with the child	1.73 (0.00)***	1.44 (0.01)*	1.11 (0.48)
Number of books at home (ref: Less than 50)			
Between 50 and 250	1.21 (0.20)	0.80 (0.15)	0.76 (0.04)*
More than 250	1.18 (0.40)	0.77 (0.17)	0.73 (0.07)
Mother helps with schoolwork (ref: never or hardly ever)			
A few times a year	1.33 (0.13)	1.10 (0.63)	0.90 (0.58)
Once a month	1.97 (0.03)*	1.46 (0.25)	1.23 (0.47)
Several times a month	0.90 (0.55)	0.88 (0.48)	0.89 (0.49)
Several times a week	0.63 (0.04)*	0.62 (0.05)	1.16 (0.50)
Visited a museum or art gallery several times in the past year	1.65 (0.00)***	1.00 (0.98)	1.07 (0.58)
I cannot sit still and read for more than a few minutes	0.67 (0.00)**	0.59 (0.00)***	1.07 (0.59)
Students don't start work for a long time after the Danish lessons begins	0.75 (0.06)	0.71 (0.02)*	0.76 (0.03)*
Most of my teachers really listen to what I have to say	1.49 (0.00)**	1.23 (0.12)	1.08 (0.57)
If I decide not to get bad grades, I can really do it	1.58 (0.00)***	1.55 (0.00)**	1.09 (0.45)
I am hopeless in Danish classes	0.66 (0.02)*	0.63 (0.01)**	1.00 (1.00)
I have always done well in mathematics	1.42 (0.01)**	2.29 (0.00)***	1.28 (0.06)
When I study, I try to figure out which concepts I still haven't really understood	1.24 (0.10)	1.24 (0.13)	0.99 (0.93)
I like to try to be better than other students	1.14 (0.39)	1.35 (0.07)	0.85 (0.24)
When studying I keep working even if the material difficult	1.04 (0.73)	0.86 (0.26)	0.96 (0.78)
Reading score	3.34 (0.00)***	2.64 (0.00)***	0.96 (0.60)
Observations	3821		
McFadden's $R^2$	0.25		
Log Likelihood	-3843		
Categories for missing observations and missing occupation included.			

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

**Table 4.** Types of Variables and Relative Contribution to the Likelihood Function.

Type of variable added (block)	# Parameters	Log- Likelihood	AIC	McFadden's $R^2$	Likelihood	
					$\Delta$ Cum. %	Cum. %
None (intercept only)	3	-5117	10240	0.00	0.0	0.0
Sex, ethnicity, and urbanization	12	-4981	9985	0.03	10.7	10.7
Family background	39	-4744	9566	0.07	18.6	29.3
Family background (+ parents' occupation)	101	-4504	9210	0.12	18.8	48.1
Family background (+ parents' education)	131	-4412	9085	0.14	7.2	55.4
Cultural capital	173	-4190	8727	0.18	17.4	72.7
School variables	185	-4156	8683	0.19	2.7	75.4
Noncognitive dispositions	221	-4036	8514	0.21	9.5	84.9
Cognitive dispositions	224	-3843	8134	0.25	15.1	100.0

*Note:* # Observations 3821. All the incremental increases to the likelihood function are significant on a 1% level. AIC takes the number of parameters into account.

mathematics will probably increase the likelihood of completing any high-school program. There is probably a high correlation between this type of noncognitive disposition and the ability to do well in math tests, but self-perception also plays an independent role.

Yet another noncognitive feature is revealed: negative self-esteem about being hopeless at the Danish language is detrimental for obtaining a high-school diploma. Hopeless is a strong expression; it adds to what Bourdieu and Passeron (1990) and Goldthorpe (2007) demonstrated, namely that some children, especially those from lower class backgrounds, tend to have negative self-images related to performances awarded in school. Even if this item is correlated with reading and writing ability, which is what I tested, it adds more than merely the reading score; accordingly, self-perception regarding language is important for educational success. "Keep working even when the material is difficult" did not prove to be statistically significant when having the self-esteem candidates onboard in the model,

opposing the findings of some other studies (see Kingston 2001, p. 95; Farkas, 2003; Fraja et al., 2010); however, it does not prove that students should not participate in school life and social events, or should not do homework (Wildhagen, 2010, p. 523).

Cultural capital in the form of embodiment: “I cannot sit still and read” negatively influences the likelihood of completing any form of high-school education. In other words, individuals with less cultural capital at the deepest level are more likely to attend vocational schools or to not complete any education. Probably, negative experiences and dispositions lessen the probability of attending academic-oriented programs. This, together with a lack of recognition, leads to a number of young people tending not to favor demanding sit-still competences. However, this particular finding has received little attention.

At the school level it is also apparent that a positive relation with the teacher helps the student to pursue academic high-school programs. Early on, Bourdieu and Passeron (1990) and DiMaggio (1982) stressed that teachers treat academically oriented students more favorably and often perceive them as more gifted than those who lack cultural capital. Inability to sit still and read will strengthen this impression. What the variable: “Most of my teachers listen to what I have to say” actually measures are debatable. I consider it a measure of how well the student fulfills the expectations of the teacher, and it addresses whether the student devotes sufficient energy to school life to experience recognition from most teachers.

Students who reported that students do not start their schoolwork after the lesson begins show to have lower odds of attending high school than those not reporting it. This indicates that the disciplinary (or effort) climate in ninth grade has an effect on the likelihood of attaining an upper secondary education. Activities such as visiting museums or art galleries also increase the likelihood of a student entering an academic high-school program – this confirms what others have found. I also attempted to include listening to classical music and theater visits but neither was significant. For parents, we also included classic literature, books of poetry, and works of art, but none was significant. So beaux arts activities matter but perhaps not that much. Educational resources was also tried (as Teachman, 1987) but showed not to be significant.

Parental involvement seems to matter a great deal. However, mothers’ help with schoolwork is divided into two so that children who receive help once a month are more likely to complete an academic high-school program than are children who receive help several times a week. Those requiring



substantial help when they are 15 years old are probably less able and seemingly have difficulties with schoolwork. Often discussing politics and social issues with parents helps the student obtain a high-school diploma, especially from an academic program. These results are in line with a number of studies reported in the literature review in which a favorable reading climate and associated skills are argued to compensate for even low levels of parental education and little or no highbrow cultural capital (cf. de Graaf et al., 2000). More fundamentally, increased intergenerational education mobility in a number of European countries, including Denmark (McIntosh & Munk, 2012), has shown that even more disadvantaged classes with little access to high culture but favoring education still have chances in the educational system, but perhaps not in the most elitists places (see also Bourdieu and Passeron, 1990; Goldthorpe, 2007; Halsey et al., 1980, pp. 13–14).

As expected, we observe that a higher reading score is statistically significant, and this is associated with a much higher likelihood of completing either of the two high-school educations. The score is probably not a pure exogenous variable. However, there is a trade off in the statistical analysis. When the reading score is included in the model, most of the effect of number of books then disappears. Number of books becomes fully significant when the reading score is not included in the analysis and possibly indicates a higher reading ability because it is a proxy for parents focusing on fundamental skills such as literacy.

Overall, social origin, sex and reading score show the largest estimates and are more important than other characteristics. More specifically, the father's and mother's occupation and education both have significant effects on the student's completion of academic and business/technical high school. In particular, occupations such as social science and teaching professionals influence the completion of high school, but having fathers in intermediate, technical, sales and administration occupations, providing relevant resources, also increases the odds of completing a high-school education. Those with a father who has a vocational degree are likely to complete any kind of upper secondary education, while a mother with a vocational education will increase the likelihood of attaining a high-school diploma. Individuals coming from a family background with a father as a director or manager have more mixed choices. Some directors have less cultural capital and tend to come from a self-employed origin. However, the almost equal three estimates ( $RRR = 2.0$ ) reflect that some students from these backgrounds experience a high degree of reproduction, while others experience educational mobility, either downward or upward. Lastly, the

odds for children of mothers working as sales, service, and care workers imply an increased likelihood of completing high school (not statistically significant in the final model).

Additionally, the results suggest that children living with both parents are more likely to complete upper secondary education than those who do not live in a nuclear family setting. The number of siblings seems unimportant for attaining upper secondary education; however, mother's age improves the probability of completing academic high school. The estimated effect of family income is statistically significant and suggests that higher family income is associated with a higher probability of completing high school. Recently, it has been debated and argued that cultural capital is now much more important than income, especially in the Scandinavian countries (Jæger & Holm, 2007). However, our results indicate that income remains important. Not surprisingly, it is observed that girls are much more likely to complete academic high school than boys are but are less likely to complete vocational education school.

In line with McIntosh and Munk (2007), Table 4 shows the logarithm of the likelihood functions, the Akaike information criteria, McFadden's  $R^2$  and the incremental increase in the likelihood function as each group of explanatory variables from the regression in Table 3 is added. The aim is to demonstrate the relative importance of different independent variables in explaining the variation in educational attainment.

Here, the order is important, for example, reading score depends on family background variables. Notably, models that explain test score results perform better than those designed to explain educational attainment (McIntosh & Munk, 2007). As a result, the net impact on educational attainment of a group of variables is measured by the reduction in log-likelihood function by including a particular group of variables. As an example, the increase in the log-likelihood function from rows eight to nine measures the net impact of test scores on educational completion. The variation explained by the model is captured by the difference between the baseline and final log-likelihood function values. The cumulative percentage increases and the differences are shown in columns five and six. Adding all the individual groups of variables incrementally leads to significant increases in the log-likelihood function.

First, we have a baseline model that contains no explanatory variables, and these occupy the first row of the table. The next row uses the dummies for basic demographic information. The third row includes family background such as income, siblings, parents' ages, and nuclear family structure. The fourth row includes parental occupation along with family background.

The fifth row uses parental educational variables together with all the family variables. The sixth row adds all the cultural capital variables. The seventh row lists school variables. The eighth row entails the noncognitive skills. Lastly, the reading score is added to the list.

The full model explains a significant part of the variation in educational attainment, and McFadden's  $R^2$  equals 25%. We look at the incremental increase in the likelihood function as each group of variables is included in the model. Table 4 shows that sex, urban, and ethnicity variables account for 10.7% of the explained variation in completion of education. The measured family background accounts for almost 45% more of the contribution to the likelihood function when controlled for sex, urbanity and ethnicity. This is composed of 18.6% coming from the basic family variables, then 18.8% more when including parental occupations, and 7% more with parental education. It means that occupational status of the parents also influences the attainment of educational success, probably by improving skills and dispositions of the students. Then, somewhat unexpected, cultural capital gives another 17.4%, composed of 7.7% parental cultural capital, comprising "number of books at home," "discussions on politics and social issues" (supporting Björklund et al., 2010b); then 3.5% comes from the mother supporting the child, and lastly own cultural capital accounts for an additional 6.2%, also covering an embodiment variable: "I cannot sit still and read for more than a few minutes." It is here that cultural capital, habitus, and noncognitive dispositions meet. The school variables account for less than 3%. We cannot conclude that school does not matter. There could be an additional peer effect as well as a teacher effect; nevertheless, several studies show that school effects are smaller than social origin variables. After having controlled for most sets of variables, I found that the net effect of noncognitive variables accounts for almost 10% of the increased log-likelihood function. Those with high self-esteem and high internal locus of control have strong beliefs that the results they obtain originate from their own behavior and actions (Borghans et al., 2008). It is striking that the magnitude of noncognitive skills remains large even after controlling for a number of other background and cultural capital variables. This finding adds to the literature. Some of the variation in the reading score is likely to be influenced by the other variables in the model; therefore, including this variable as the last shows that the net effect of the reading score accounts for 15% of the explained variation.

The results support the findings of McIntosh and Munk (2007). For example, the present study shows that three sets of indicators, measuring

cultural capital, school variables, and noncognitive dispositions, as a whole, account for almost 30% of the explained variation in the completion of upper secondary education, while family background alone accounts for nearly half of the explained variation. In addition to McIntosh and Munk's (2007) findings, there are now more candidates, for example, parental involvement and noncognitive dispositions. To conclude, Table 4 demonstrates the relative importance of different independent variables in explaining the variation in educational attainment.

## **DISCUSSION AND CONCLUSION**

The results describe an asymmetry between families with many resources, much capital and many noncognitive capacities and those with fewer resources, less capital, and fewer noncognitive capacities. That a higher parental occupation clearly has the biggest effect on the model reflects the importance of the social position of the father and the mother when comparing parents with highly skilled jobs and parents with little education and semi- or unskilled jobs and will, to a great extent, still structure choices and attainments within a family. Many studies have found that parental occupational position structures educational and occupational attainment. Among employed parents, for instance, both parents' occupations independently shape children's educational outcomes (Kalmijn, 1994). Our results also show that mothers' and fathers' education matters for the offspring's attainment and, according to the definition from Bourdieu (1986), captures elements of parental cultural capital (see also Downey, 1995). Notably, there is a group of young people from vocational backgrounds who wish to complete high-school programs, potentially leading to an increase in educational mobility. The two types of high-school track create opportunities for children with little cultural capital but who realize that future labor markets demand people with applicable skills. Consequently, much has happened since Kandel and Lesser (1970, p. 285) wrote "Despite its intellectual climate, the Danish School does not appear to support social mobility to the extent observed for the United States." Educational mobility is perhaps due to a cumulative effect of improved social and educational conditions (DiPrete & Eirich, 2006). The remaining large social difference is still between families with extensive qualifications and those without or with very few qualifications. Gender matters too. The results confirm that girls are now doing much better in the educational system than boys are.

However, this is not the full picture. Those children who have more cognitive skills and more noncognitive skills will do better, supporting recent research highlighting that other variables play important roles in educational attainment. The reading score stands out and is associated with a much bigger chance of completing either of the two high-school streams of education. Accordingly, reading abilities influence the completion of upper secondary education and then a good predictor of choosing academic tracks. It is striking that the magnitude of noncognitive capacities stands out even after controlling for other kinds of variables. Having strong beliefs and the capability to carry out relevant actions in mathematics, language and other activities, in order to deal with demands in the school, makes a difference. Most likely, there is a high correlation between these types of noncognitive dispositions and the ability to do well in math tests; nonetheless, self-perception plays an independent role. It is important to underline that the noncognitive and cognitive dispositions are not created only in early childhood but throughout the entire childhood: “The evidence does not support the theses that educational achievement is determined by abilities fixed in early childhood, that family resources other than cultural capital are unimportant or that school processes are irrelevant” (Nash, 2003, p. 446; see also Bourdieu, 2000; Heckman, 2006, 2008).

I also found that those who reported that most teachers listened to them in ninth grade have a higher probability of completing high school. Although this variable is somewhat ambiguous, I consider it an indicator of how well the child fulfills the expectations of the teacher. Wildhagen (2009, p. 192f.) also finds an effect of respondent’s adaptation to prevailing conduct and norms on teacher’s perception. Parental involvement, measured by how often parents discuss politics and social issues with the child, and whether the mother helps with schoolwork, show to be important for completing any high-school program. It could be that middle- and upper-class parents intentionally cultivate children’s social skills, such as addressing and negotiating with figures of authority (Lareau, 2003). The impact of cultural resources is likely to add up.

I believe the hypotheses are confirmed to some degree. Most of the noncognitive dispositions turned out to be important, while other items were not important, for example, the keep working category, so there is some support for the research hypothesis. Even after having controlled for different forms of family background and cultural capital variables, noncognitive skills show to contribute to almost 10% of the explained variation. It is surprising that the statistical effect is so big. However, it underlines the necessity of including more of these variables in future studies

on educational attainment. Instead of focusing on forms of cultural capital, more noncognitive skills variables should be used. Much noncognitive skills-based literature does not relate to sociological literature about the parents' social position (an exception is DiPrete & Jennings, 2012). In other words, working-class students who in their neighborhood and school experience that their dispositions are less valuable than the class-based dispositions of their privileged peers will further realize that high educational attainment and superior academic achievements are simply not for them. Conversely, privileged students' confirmation of the legitimacy of their dispositions will serve to cement their sense of entitlement to educational rewards (Wildhagen, 2010, p. 525).

When both parental cultural capital and cultural capital are included in the model, I found that cultural capital is somewhat more important than expected, but some of the highbrow variables included (not shown in Table 3) showed not to be important. The fact that cultural capital still matters could be due to inclusion of more sophisticated cultural endowment variables rather than highbrow variables, even when compared with the dominant effect of family background. It could be that familiarity with legitimate culture incorporated at a deeper level related to the habitus of the family is more important than superficial status signals. Many studies focus on verbal and mental skills, and too few on the interconnected body skills and abilities (Dumais, 2006, p. 85, referring to David Swartz). The evidence in my study supports a point made by Wildhagen (2010), who contends that cultural capital and habitus work together to affect educational outcomes for students. In my view, they are per definition interrelated through the first dimension of cultural capital. This would also explain why so many studies have found that high aspirations or high self-esteem are important for determining educational and labor outcomes, where students with lower expectations are less likely to complete formal education. Kingston (2001) argued for better measures of cultural capital, which would facilitate a better condition for investigating the process from inherited and acquired cultural capital to the conversion into academic achievements and diplomas. Even if Kingston also pointed out the problem of omitted variables and stressed a number of important variables, for instance, parenting style, encouragement of academic engagement – omitted, for example, in Aschaffenburg and Maas (1997) – family income and occupational status of the parents, the importance of which my studies confirm, he still lacked the concept of habitus and possibly omitted to link his findings to the literature on noncognitive skills. Finally, most researchers of educational attainment have not looked into the

strategic part of investments in education from different families with different positions.

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## NOTES

1. Another important reference related to this issue is Black, Devereux, and Salvanes (2005), who ask whether parental education actually changes the outcome of children, suggesting an important spillover of education policies, or whether it is merely that more able individuals who have higher education also have more able children? They use the reform of the education system implemented in different municipalities at different times throughout the 1960s as an instrument for parental education. Their findings suggest that the high correlations between parents' and children's education are due primarily to family characteristics and inherited ability and not to education spillovers.

2. The individual's system of dispositions is thought to correspond with the system of social positions (Bourdieu, 1981, p. 309ff).

3. "One may suppose that, to obtain the sacrifice of 'self-love' in favor of a quite other object of investment and so to in calculate the durable disposition to invest in the social game which is one of prerequisites of all learning, pedagogic work in its elementary form relies on of the motors which will be at the origin of all subsequent investments: the search for recognition" (Bourdieu, 2000, p. 166).

4. See for example Breen and Jonsson (2000) who developed a multinomial transition model and showed that the passage through the educational system influences the probability of making subsequent educational transitions. Advances in computational methods have made it possible to estimate dynamic structural models of the full sequence of educational decisions (Belzil & Hansen, 2003; Keane & Wolpin, 2001). While these models are considerably more complicated than those used here, conclusions are very much in line with what others have found.

5. This category also includes Higher Preparatory Examination (HF). Additionally, students who successfully completed both a vocational and high-school (or gymnasium in Danish) education are categorized with high-school graduates.

6. Some individuals may wait some time before continuing their studies after their primary education, that is, data is right-censored, but we assume this to be a limited problem here.

7. Unemployed, outside the labor market, and employed without further specification are also included in the analysis.

8. This five-category ordinal variable is included in the statistical model as a binary variable because of an unfortunate error in the Danish version of the Student Questionnaire. The third category is “once a year” instead “once a month”. In an attempt to mitigate this, we have coded variable 0 = Not more than about once a month, 1 = more than several times a month, see Appendix Table A.1.

9. Weighted likelihood estimate provided by the OECD with the PISA data set (see OECD 2002a for a detailed description).

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## APPENDIX

**Table A.1.** Recoded PISA Survey Variables.

Questions/Items in Survey	Recoded Values
How many books are there in your home (st37q01)?	0. Less than 50, 1. Between 50 and 250, 2. More than 250
“In general, how often do your parents: Discuss political or social issues with you? (st19q01)?	0. Never or hardly ever- about once a month, 1. Several times a month – several times a week
“How often do the following people work with you on your <schoolwork>?” Your mother (st20q01).	0. Never or hardly ever, 1. A few times a year, 2. About once a month, 3. Several times a year, 4. Several times a month
“During the past year, how often have you participated in these activities?” Visited a museum or art gallery (st18q02)?	0. Never or hardly ever-once or twice a year, 1. More than twice a year
“How often do these things happen in your Danish lessons?” Students don’t start working for a long time after the lesson begins	0. Never- some lessons, 1. Most lessons – Every lesson
“How much do you disagree or agree with each of the following statements about teachers at your school?” Most of my teachers really listen to what I have to say (st30q03)?	0. Strongly Disagree-Disagree, 1. Agree- Strongly agree
“How often do these things apply to you?” If I decide not to get any bad grades, I can really do it (cc01q11)	0. Almost never- Sometimes, 1. Often – Almost always
“How often do these things apply to you?” When studying, I keep working even if the material is difficult(cc01q12)?	0. Almost never- Sometimes, 1. Often – Almost always
“How much do you disagree or agree with each of the following?” I’m hopeless in Danish classes (cc02q05).	0. Disagree-Disagree somewhat, 1. Agree somewhat- Agree
“How much do you disagree or agree with each of the following?” I have always done well in mathematics (cc02q18).	0. Disagree-Disagree somewhat, 1. Agree somewhat- Agree
“How often do these things apply to you?” When I study, I try to figure out which concepts I still haven’t really understood (cc01q19)?	0. Almost never- Sometimes, 1. Often – Almost always
“How often do these things apply to you?” I like to try to be better than other students. (cc02q04)	0. Disagree-Disagree somewhat, 1. Agree somewhat- Agree
How much do you disagree or agree with these statements about reading?” I cannot sit still and read for more than a few minutes (st35q09)?	0. Disagree-Disagree somewhat, 1. Agree somewhat- Agree

*Note:* Variable name in the PISA 2000 Questionnaire in parentheses, see OECD (2002b).