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WHO GETS AHEAD IN ESTONIA AND AMERICA? A COMPARATIVE ANALYSIS OF MENTAL ABILITY AND SOCIAL ORIGIN AS DETERMINANTS OF SUCCESS

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Abstract. Status attainment research has shown that people's mental ability (intelligence) is an important determinant of their career success in western societies. But so far, no study has investigated the impact of mental ability on career success in Estonia. The present paper analyzes a longitudinal data-set from Estonia to fill this gap and compares the results with a similar data-set from the United States. The impact of mental ability is compared to the impact of social origin. Success is conceptualized as education, occupation and income of an individual. The analyses demonstrate that both mental ability and social origin have a positive effect on success in Estonia and the United States. However, the impact of mental ability is stronger in the United States and the impact of social origin is, to a lesser extent, stronger in Estonia. It can be concluded that Estonian society is less open and meritocratic than American society.

Keywords: intelligence, mental ability, status attainment, social mobility, socioeconomic status, career success, Estonia

1. Introduction

The concern about being successful, making a career, being well off, seems to be the central feature of western societies today. Although it is a common practice to denounce the purely materialistic world-view and say that 'money does not buy you happiness', the ideal of a life centered around career and consumption is still a trade-mark of western culture throughout the world. It is not surprising, therefore, that much research has been carried out to answer questions like 'who gets ahead?' (the title of an important monograph by Jencks et al. 1979), 'who wins and who loses?', 'what are the determinants of individuals' career success?'. In sociology, this kind of research is often called status attainment research. The present paper belongs to the status attainment paradigm and presents a comparative analysis of the determinants of success in Estonia and the United States. The main purpose of

the paper is to analyze mental ability (intelligence) as a determinant of success in Estonia.

1.1. Indicators of success

Status attainment research is mostly concerned with three kinds of success – educational, occupational and financial. That is, success (attained status) is conceptualized as educational level, occupational level or income of an individual. It is usually assumed that all of them can be measured on interval (or at least ordinal) scale. That is, they are assumed to order people on a *continuum* of success. But this assumption is not equally shared by all researchers. Actually, income is the only variable of the three that has no problems in this respect and this is probably the reason why economists have concentrated almost exclusively on that indicator (see Bowles et al. 2001). Education is the second least problematic because it can be quite conveniently measured by years of schooling (number of years the individual has spent studying).

Occupation is the most problematic indicator of success as far as measurement issues are concerned. There is a conflict between status attainment and class structurationist approaches (as they are called by Bond and Saunders 1999) over the proper conceptualization of occupational status. Status attainment paradigm uses occupation as a continuous variable and has generated a number of quantitative indexes to allow occupations to be measured as a social hierarchy ranging from more prestigious occupations to less prestigious ones (see e.g. Blau and Duncan 1967, Ganzeboom and Treiman 1996a). Class structurationist paradigm says that occupations cannot be ordered on a single hierarchical dimension and, instead of that, we should treat occupational groups as qualitatively different classes and study mobility between them (Erikson and Goldthorpe 1993). Since there is no easy way to reconcile these approaches, it is not uncommon to use both approaches in one paper and this will also be done in the present article.

1.2. Determinants of success – social origin and mental ability

The number of factors that can in principle influence individuals' success is enormous. However, it can be said that there are three factors, which are central to the sociological research on status attainment processes – social origin, mental ability and education. These three constitute the core of the classical models of status attainment (see Blau and Duncan 1967, Jencks et al. 1972, Sewell et al. 1969). The first two of them will be at the center of this paper. But before I look at them more closely, a few words about the third one. Education has a twofold role in status attainment research – it is an important indicator of success but it is also an important determinant of further occupational and financial success. In fact, it is probably the most important determinant of success throughout the world (Treiman and Yip 1989). *"[E]ducational attainment is the main force that drives the process of stratification"* (Ganzeboom and Treiman 1993:467) and other forces, like social origin and mental ability, are likely to have much of their

influence on occupation and income through their influence on education (Jencks et al. 1972, Sewell et al. 1969).

Social origin is usually operationalized as parental education, parental occupation, parental income or a combination of them. It has been, to a large extent, the main mission of status attainment and social mobility research to document the intergenerational transmission of social status, that is, the influence of social origin on personal success (Ganzeboom et al. 1991). And it has been established beyond doubt that the social status of an individual in adulthood is positively associated with the status of his or her parents. Comparative international studies have also shown that the relationship between father's occupation and son's occupation is stronger in non-industrialized countries (like India) than in industrialized countries (like the United States) and that this relationship has grown weaker during the 20th century (Ganzeboom et al. 1989, Treiman and Yip 1989). In other words, western countries are more open (or meritocratic) than non-western countries and the openness has been increasing.

Social origin has been the favorite determinant of success among sociologists but it is certainly not the only one. Mental ability (intelligence) is a good candidate for an alternative major determinant. The question about the relative roles of social origin and mental ability in people's career success is one of the central questions of status attainment research. It is a question about the level of meritocracy in society – whether successful people have earned their success with their own abilities or are they just lucky to have rich and educated parents (Saunders 1995, 1997)? The relationship between mental ability and career success has been studied since the first half of the 20th century (Ball 1938, Thorndike et al. 1934), but until the 1960s this research was conducted in isolation from the research on the relationship between social origin and career success, thereby leaving the door open to criticism that the positive correlation between intelligence and success might actually be the result of social origin influencing them both (McClelland 1973). Since the end of 1960s, investigators started to consider the two alternative determinants simultaneously (Duncan 1968, Jencks et al. 1972, Sewell et al. 1969) and the general conclusion from these analyses seems to be that social origin and mental ability influence status attainment, to a large extent, independently of each other.

Intelligence is, therefore, a necessary addition to the models of status attainment. But it was not until the publication of *"The Bell Curve"* in 1994 (Herrnstein and Murray 1994) that mental ability really came to the spotlight of sociologists' attention. Herrnstein and Murray performed several analyses and showed that, in the United States, intelligence has a much stronger influence on a number of positive outcomes (including income) than socioeconomic status (a combination of parental occupation, education and income). They also argued that the positive correlation between parental status and success actually results from the intergenerational genetic transmission of mental ability from parents to children. These analyses have been severely criticized for a number of reasons (see e.g. Fischer et al. 1996, Hauser and Huang 1997). At the same time in Great Britain, a similar discussion was inspired by the work of Saunders who showed that intelligence has a stronger

influence on occupational attainment than father's occupation and that Britain is, therefore, to a large extent, a meritocratic society (Bond and Saunders 1999, Saunders 1997, 2002). These conclusions were challenged by Breen and Goldthorpe (1999, 2001, 2002) who argued that Saunders greatly over-estimated the importance of intelligence. The analyses in the present paper are inspired by these controversies.

1.3. Determinants of success in Estonia

In 1940, Estonia became part of the Soviet Union; the Soviet system collapsed by the end of 1980s and Estonia was re-established as an independent republic in 1991. It seems to be a common opinion that inequality has become a great social problem in Estonia since then (Lauristin and Vihalemm 1997, Vetik 2002). It is not surprising, therefore, that quite a lot of research has been carried out to explain why some people are better off materially than others. Explanations of material success in modern Estonia include gender (men have higher incomes than women, see e.g. Murakas and Trapido 1999, Titma and Kõiv 2002), nationality (Estonians have higher incomes and better jobs than people from other nationalities, see e.g. Krusell 2002, Toomse 2003), place of residence (it is generally believed that living in a big city is a considerable advantage in career pursuits, see e.g. Titma and Taru 1999), age (older people generally feel themselves to be lower in social hierarchy, see e.g. Lauristin 2004), being born at a right time (this is the so-called 'winners generation' hypothesis, which states that people who graduated from universities in the late 1980s and early 1990s had more chance of finding a good job than older and younger generations, some support for it is presented by Murakas and Trapido [1999] and Toomse [2003]) and education (many studies have shown that education is the main road to prestigious occupation and high income in Estonia as it is in the rest of the world, see e.g. Helemäe et al. 2000).

The effects of social origin have also been investigated in a number of publications. It has been shown that parental education and occupation have a significant effect on their children's educational and occupational attainment after controlling for a number of other predictors (Titma and Kõiv 2002, Titma and Taru 1999, Toomse 2003) but there seems to be little effect on income (Titma and Kõiv 2002). Helemäe et al. (2000) have suggested that even grandparental social status has an independent effect on success in today's Estonia. Analysis of occupational attainment throughout 1990s has shown that the effect of father's education has grown stronger during that period (Toomse 2003). International comparisons with former Soviet countries have shown that the influence of father's education is stronger in Estonia and Latvia than in Russia or Ukraine (Titma et al. 2003).

All in all, these findings provide quite a good picture of the determinants of success in Estonia. But there is one important variable, which is still missing from this picture – mental ability. To my knowledge, no study has yet investigated the effects of mental ability on people's educational, occupational or financial success in Estonia within the framework of status attainment paradigm. But based on the research reviewed earlier, there is every reason to believe that intelligence might be

an important determinant of status attainment in Estonia, as it is in the United States or Great Britain.

It does not mean that there has been absolutely no research on the relationship between mental ability and some criteria of success in Estonia. In fact, a number of studies have investigated the relationship between intelligence and school grades. The earliest of them is the study by Tork, conducted in the 1930s, which reports several correlations between ability test scores and average school grades for children of about 13 years old (Tork 1940:329). The correlations are mostly between 0.50–0.60. In the Soviet period, a study of students entering universities in 1975 found a correlation of 0.59 between ability test scores and average grades in secondary school and a correlation of 0.61 between ability test scores and average grades in university (Sukamägi 1994a:155). After the Soviet period, a large-scale study conducted in 2001 with children aged 12 to 18 found correlations around 0.30 – 0.50 (with an average of 0.43) between test scores and average grades for different age and gender groups (Laidra 2002:17). A smaller study by Tina (2002) has obtained similar results. As for other criteria of success, at least one study has investigated the relationship between intelligence and supervisory ratings of job performance ($r = 0.14$, Sukamägi 1994a:155). And at least one study has found a positive relationship between intelligence and performance in military service (Seepter 2001). No study conducted so far in Estonia, however, has investigated the relationship between mental ability test scores and the kind of success criteria used in status attainment literature (see section 1.1). The present paper attempts to fill this gap by analyzing a recently gathered large longitudinal data-set from Estonia, which contains, among other things, data on intelligence test scores.

1.4. The present research

The main purpose of this paper is to analyze the role of mental ability in the status attainment process in Estonia. But it is not the only purpose – actually, the following analysis will be comparative in two senses. First, since it is not very informative to study the determinants of success in isolation, the role of mental ability in the status attainment process will be compared to the role of social origin. And second, since the results from only one country are perhaps hard to evaluate, results from the Estonian study will be compared to results from a similar longitudinal study from the United States.

The general hypothesis of this paper is that both intelligence and social origin have a positive impact on educational, occupational and financial success in Estonia and America.[1] At a more specific level, one might speculate that the influence of

[1] In this paper, intelligence and social origin are treated as theoretically independent (though empirically correlated) constructs. That is, neither of them is assumed to have a causal impact on the other. Some models of status attainment have, of course, assumed that mental ability is influenced by one's social origin (e.g. Jencks et al. 1972). Others have claimed that one's social origin is influenced by the genes for intelligence that run in the family (e.g. Herrnstein and Murray 1994). It is not possible to resolve these issues in the present paper.

intelligence (in an absolute sense and relative to the influence of social origin) should be stronger in Estonia than in America. This idea is based on the research that has shown that mental ability is especially predictive of performance in unstable laboratory environments (LePine et al. 2000) and complex working conditions (Hunter and Hunter 1984). Since Estonian society, unlike American society, has recently experienced great social transformations, the recent social context of Estonian society can be said to be more complex and unstable than the one in America. One might speculate that harsh and unstable social environment should increase the competition for scarce resources and give rise to a kind of 'survival of the most intelligent' effect, and hence the expectation of greater predictive power for intelligence in Estonia. The influence of social origin, on the other hand, can be expected to be weaker in Estonia than in America due to the same reason – the social transformations – which might have interfered with intergenerational transmission of social advantage.

On the other hand, it must be kept in mind that the United States is known for its openness and comparative research has generally found social origin to be less predictive of status attainment in America than in most western countries and other parts of the world (Erikson and Goldthorpe 1993, Ganzeboom et al. 1989). Thus, in this paper the stratification processes of relatively stable and open America are contrasted with relatively unstable Estonia. That is why it is hard to formulate any specific hypotheses about how the two countries differ in terms of the absolute and relative importance of social origin and intelligence.

2. Data and variables

2.1. Data

Data for Estonia come from a data-set called Paths of a Generation (PG), a longitudinal survey conducted under the supervision of Mikk Titma (see Titma 1999, Titma and Tuma 1995). The sample consists of about 3 000 young people who were first contacted in 1983 when they were on average 17.6 years old. They have been contacted four times so far, the last time in 1997 when they were on average 31.8 years old. During that period, Estonian society had experienced radical social transformations and, therefore, the PG sample offers a unique opportunity to study individual life-course at the time of historical changes. I use data from the first, third and fourth round of the survey. The sample surveyed by PG was chosen to be representative of the people who were graduating from secondary education in 1983. The people who had left school earlier than that are, therefore, missing from the sample, but the percentage of such people should not be large since finishing secondary education was almost compulsory in Soviet Estonia at the time (see Helemäe et al. 2000). The indicators of success – educational, occupational and financial attainment – are measured in 1997. By that time, the main political and economic transformations of Estonian society were already in the past and the social environment was characterized by growing living

standards, increasing stratification, consumerism, etc. (Lauristin and Vihalemm 1997). The median age of the respondents was 32 at the time. It can be safely assumed that most people have already started their careers by that age and can be quite reliably classified as more successful or less successful.

Data for the United States come from the National Longitudinal Survey of Youth (NLSY), a nationally representative longitudinal study of about 13 000 young people who were first surveyed in 1979 when they were on average 17.9 years old and who have been recontacted repeatedly since then (see Miller 2001). The indicators of success are measured in 1993 when the average age of the respondents was 31.9.

The two surveys are similar in many respects – both are longitudinal and were started at almost the same time (in 1979 and 1983). The median age of both samples is 18 at the first and 32 at the final measurement. The present paper, thus, covers a period of 14 years from adolescence to young adulthood. The determinants of success (social origin and intelligence) are measured at the first rounds of the surveys[2] and the actual success is measured 14 years later – this aspect of the surveys makes causal inferences possible. The two samples should be highly comparable in that respect. To ensure the comparability further, I will use similar sets of variables from both. The variables can be divided into (1) the indicators of success – education, occupation and income; (2) the central determinants of success studied in this paper – social origin and mental ability; and (3) background variables, which are not at the center of the study but which are known to influence status attainment and, therefore, have to be controlled in statistical analyses.

2.2. Indicators of success

In both surveys, the indicators of success are measured in the last rounds covered in the present paper – in 1997 in the PG and 1993 in the NLSY (the only exception is income for NLSY, as explained below).

Education. In this paper, all information about educational levels is expressed in years of schooling. In the NLSY data-set, the information about education was already coded into years of schooling. In PG survey, the respondents were asked to indicate the highest educational level they had completed (e.g. secondary education, higher education). These levels were transformed into approximate years of schooling corresponding to the levels (see Titma and Hämmal 2002).

Occupation. The respondents were asked about their current or last occupation at the time of the last survey (thus, for the respondents who were not working at the time, the last occupation was used). As mentioned above, there are two approaches to the study of occupational status in sociology. One of them uses occupation as a continuous variable and the other prefers to group occupations into nominal categories. As both approaches have their advantages, I used both.

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[2] Strictly speaking, social origin is not measured at the first round in the PG survey; the measurement was done at the third round, but it refers to the time of the first round (see below).

In the PG data-set, the occupations were originally coded into ISCO-88 (International Standard Classification of Occupations of the year 1988) categories, in the NLSY data-set the U.S. Census categories were used. I transformed both of them into the International Socioeconomic Index of Occupational Status (ISEI) and Goldthorpe's class-schema using the methodological tools provided by Ganzeboom and Treiman (1996b).

ISEI is a continuous occupational scale that assigns each occupation a score representing the "*weighted averages of standardized measures of the income and education of incumbents of each occupation.*" (Ganzeboom and Treiman 1996a: 204). That is, the higher the ISEI score of an occupation, the higher the average education and income of the people holding the occupation. The scores are also strongly related to the general prestige or desirability of occupations (Ganzeboom and Treiman 1996a). Among the highest scoring occupations are, for example, judge, medical doctor, university professor and among the lowest scoring are carbage collector, housemaid, forestry laborer, etc.

To analyze occupational status as a nominal variable, I used Goldthorpe's class-schema, which divides occupations into qualitatively different categories or classes based on a number of criteria: for instance, whether the person is an employee or self-employed, whether the nature of the work is manual or non-manual, etc. (see Erikson and Goldthorpe 1993). The most often used version of Goldthorpe's schema distinguishes seven classes; in this paper, however, a more simplified version had to be used. First, the category of self-employed workers had to be excluded because there were no self-employed people among the parents of the PG respondents (self-employed workers did not exist in the Soviet Union) and consequently, for reasons of comparability, this category could not be used for PG respondents' own occupation or for the NLSY sample.[3] Second, some of the remaining categories contained too few cases and had to be combined with others. In the end, I was left with a four-class version distinguishing the following occupational groups (see Ganzeboom and Treiman 1996a) – higher service class (e.g. member of parliament, medical doctor, university professor, lawyer), lower service class (e.g. secondary school teacher, actor, real estate agent), routine non-manual workers and skilled manual workers (e.g. secretary, cook, carpenter), and unskilled manual workers and farm workers (e.g. motor-vehicle driver, housemaid, janitor). The categories are rather heterogeneous but it is nevertheless obvious that the categories differ in terms of job rewards and desirability, the first two categories containing the most prestigious occupations and the last one containing the least prestigious ones (see Erikson and Goldthorpe 1993, Table 2.2).

Income. In the PG survey, the respondents were asked about their income from different sources during the last month. Incomes from the following sources were summed to obtain a measure of total income – job salary from main occupation,

[3] As the class-categories will be used to conduct an analysis of social mobility (see Table 5), it is preferable that both father's and respondent's positions are measured with exactly the same categories.

income from extra work, income from business, income from trading and income from selling farm products. For NLSY, I used the 1994 survey, which asked respondents about their income in the past year (that is, their 1993 income) from the following sources – income from main occupation, income from business, income from farm. Again, the different sources were summed to obtain a measure of total income. And finally, following the usual practice (see Becker and Tomes 1986), the income measures of both surveys were transformed into logarithmic scale to obtain a normal distribution. In the logarithmic transformation, all cases with zero-values are deleted leaving only individuals with non-zero incomes.

2.3. Mental ability

Although the PG data-set has been analyzed in a number of publications (e.g. Titma 1999, 2002), its mental ability measures have not been included in any of them. The intelligence testing took place in 1983 under the supervision of Aimi Sukamägi. Unfortunately, only about half of the sample was tested and, therefore, the sample with information on ability is much smaller than the complete PG sample, but it should nevertheless be large enough to allow reliable conclusion to be made about the role of intelligence in the life course of Estonian people. The intelligence measure used in the testing was General Aptitude Test Battery (GATB), a personnel selection test created in the United States in the middle of the 20th century and translated into Estonian and Russian languages in 1970s (see Sukamägi 1994b). GATB is one of the most widely used personnel selection tests in the United States, its validity in predicting job performance has been confirmed in hundreds of studies (Hunter 1986, Hunter and Hunter 1984).

GATB consists of a number of subtests, which should measure different, potentially job-relevant, aptitudes (e.g. spatial aptitude, verbal aptitude, etc.). The PG data-set contains data on eight GATB subtests, of which three are the most important in the present context. These three are Arithmetic Reasoning (testing the ability to understand and solve mathematical problems), Vocabulary (testing the ability to understand word meanings) and Three Dimensional Space (testing the ability to visualize different geometrical shapes). The aptitudes measured by these subtests are numerical aptitude, verbal aptitude and spatial aptitude, respectively. These three subtests together constitute a composite factor called General Learning Ability (see Anastasi 1976). General Learning Ability has been described as *"[t]he ability to 'catch on' or understand instructions and underlying principles; the ability to reason and make judgements"* (Gaines and Stroupe 1994:2). It should, therefore, be the most g-loaded portion of GATB, that is, the closest thing to general mental ability in GATB. To obtain a measure of general intelligence, I used principal component analysis (as suggested by Jensen 1980) to extract a principal component from the three subtests. The principal component is standardized to have zero mean and a standard deviation of 1. The factor loadings and explained variance of the three subtests are presented in Table 1. As is evident from the table, all three subtests have fairly similar factor loadings and, therefore,

contribute equally to the principal component, which will be used as a measure of general mental ability in the rest of the paper.

Table 1. Principal component analysis – first principal components of mental ability subtests

Subtests	Estonian sample	American sample
	Factor loadings	
GATB: Arithmetic reasoning	0.82	
GATB: Vocabulary	0.79	
GATB: Three-dimensional space	0.74	
AFQT: Arithmetic reasoning		0.87
AFQT: Word knowledge		0.91
AFQT: Paragraph comprehension		0.90
AFQT: Numerical operations		0.82
Explained variance	61.12	77.14

In the NLSY, mental ability was measured around 1980 with Armed Forces Qualification Test (AFQT), a combination of tests of Arithmetic Reasoning, Word Knowledge, Paragraph Comprehension and Numerical Operations. Again, principal component analysis was used to extract a measure of general intelligence from the four subtests (see Table 1). AFQT has been used repeatedly in status attainment literature (e.g. Brown and Reynolds 1975, Nyborg and Jensen 2001). It is interesting to note that the notorious *Bell Curve* (Herrnstein and Murray 1994) also used data from the NLSY and its conclusions about the role of mental ability are based on the analyses of the same AFQT scores. AFQT is actually part of a larger test, Armed Services Vocational Aptitude Battery (ASVAB); it is the most g-loaded portion of ASVAB (Herrnstein and Murray 1994), just like the General Learning Ability is the most g-loaded portion of GATB. ASVAB and GATB are known to be similar in content as both were constructed for the purpose of personnel selection (see e.g. Schmidt et al. 1992); therefore, the ability measures of the two data-sets provide a good basis for comparative analysis.

There has been some discussion in the personnel selection literature over whether it is appropriate to combine tests of specific aptitudes into a single measure of general ability (see Schmidt et al. 1992), for it is possible that specific aptitudes might be better predictors of job performance than general ability. Several studies have shown, however, that this is not the case – tests of specific aptitudes are not better predictors of performance than tests of general intelligence (Hunter 1986; Ree et al. 1994). This question has not been systematically investigated in the status attainment literature, but the correlations presented by Jencks et al. (1979, Tables 4.1 and A2.9) suggest the same conclusion – general ability (a combination of scores on several subtests) correlates higher with educational, occupational and income attainment than any of the subtests. Since it is a very important question methodologically, it will also be briefly addressed in this paper.

2.4. Social origin

Father's and mother's occupation. These variables refer to parental occupations at the time of the first survey in both samples. In the PG sample detailed information about parental occupations was obtained in the third (1993) round of the survey – every respondent was asked what were his or her father and mother (or stepfather and stepmother) doing when the respondent graduated from secondary school. If the information for that time was missing, parents' occupations at the time the respondent graduated from primary school were used instead. Parental occupations were coded into ISEI scores and Goldthorpe's categories the same way as respondents' own occupations.

Father's and mother's education. Respondents were asked about the current level of education of their parents in the first round of the survey in both samples.

Material well-being of the family of origin. The 1979 round of NLSY obtained information about the total family income of respondents' family in the past year. Only those respondents who were living with their parents in 1979, and for whom family income refers to their parents' income, are included in this paper. PG does not contain any information about parental income, but the respondents were asked about the material well-being of their family in 1983 – a list of items was presented to them and they had to indicate for every item, whether their family had it (= 1) or not (= 0). The answers were summed. The items used in this paper are: own house, summer house, private flat, own car, color TV, radio, tape recorder, new furniture, works of art, library with more than 200 books, respondent's own room.

Index of socioeconomic status (SES). I constructed a general index of socioeconomic status by extracting a principal component from the three measures of parental status – mean parental education (if information was missing for one parent, only the one of the non-missing information was used), mean parental occupation (measured with ISEI; again, if information was missing for one parent, only the one of the non-missing information was used) and material well-being of the family of origin. The factor scores of the principal component will be used as general measures of SES. The principal component has a mean of 0 and a standard deviation of 1. The factor loadings for both data-sets are presented in Table 2. As is evident from the table, the two SES measures are quite similar in terms of factor loadings and explained variance.

The reason for using a combined index of SES instead of single variables of parental status is similar to the reason for preferring general mental ability over specific aptitudes – it should be a better predictor of success than any of the single measures since different parental characteristics are, to some extent, independent of each other, and a combination of them should, therefore, explain more variance in the dependent variable. In support of that reasoning, White's review has shown that the measures of social origin that combine two or more parental characteristics into one index are better predictors of children's academic achievement than single parental characteristics (White 1982, Table 6). For that reason, such combined indices are often used in the status attainment literature (e.g. by Herrn-

stein and Murray 1994, Sewell et al. 1969). But their use has also been criticized and some authors prefer not to combine different parental characteristics into one index (e.g. Fischer et al. 1996). This issue will also be briefly addressed below.

Table 2. Principal component analysis – first principal components of parental characteristics

	Estonian sample	American sample
Parental characteristics	Factor loadings	
Parental education	0.89	0.83
Parental occupation	0.89	0.84
Material well-being	0.52	0.70
Explained variance	61.47	62.92

2.5. Background variables

Age. The age of the respondents does not have much variance in either samples but it still seems appropriate to control for it. Especially since it has been pointed out that AFQT scores should never be used without age as a control variable (Herrnstein and Murray 1994).

Gender. This variable is coded 1 if the respondent is male and 2 if the respondent is female.

Ethnicity. The function of this variable is to indicate whether the respondent belonged to the 'dominant' ethnic group or not. It has somewhat different meanings in Estonia and America. In the Estonian sample it means that the respondent's main language in 1983 was either Estonian (= 1) or something else (= 0). The best corresponding variable for it in the American study seems to be racial origin – whether the respondent is White (= 1) or Black, Hispanic or something else (= 0).

Residence. The nature of the place of residence at the time of the first survey is captured by a five-point variable (1 = in the country, …, 5 = in the capital city) in Estonia and a two-point variable (1 = rural area, 2 = urban area) in the United States. Residence at the time of the first survey, rather than the last survey, is used because the latter might be influenced by the career choices of the respondents.

3. Results

The analytical strategy of the paper will be following. At first, simple bivariate relationships are calculated in order to ascertain that there is a positive relationship between social origin and mental ability on the one hand, and attained status on the other hand. Next, more complicated multivariate regression analyses will be conducted to find out if social origin and mental ability influence status attainment independently of each other and background variables. A further aim of the multivariate analysis is to compare these influences in Estonia and America, and to shed

light on one of the big questions of status attainment research – which one is more important, social origin or mental ability? The common practice, in answering the latter kind of question, is to compare the size of the standardized regression coefficients of the variables. But it should be noted that some authors (e.g. King 1986) have expressed doubts about the rationality of this practice. King claims that it makes no sense to compare the size of regression coefficients (even standardized ones) of independent variables, which have a different metric (see also Breen and Goldthorpe 1999, 2001). In this paper, the measures of SES and general mental ability are obtained factor analytically, by combining several original variables; both are standardized to have a mean of 0 and a standard deviation of 1. The metric of the variables is, thus, similar in terms of statistical properties, but also substantively in the sense of being abstract and not having an intuitively meaningful unit of measurement. Therefore, I believe that the two variables have been rendered as similar as they possibly can be.

In Table 3, indicators of success are correlated with index of socioeconomic status, single measures of parental status, general mental ability and subtests of ability.[4] The most general result from the correlational analysis is that all the correlations are positive and significant at the 0.001 level. Thus the basic zero-order relationship of mental ability and social origin with success is positive in both countries.

Table 3. Correlations of indicators of success with social origin and mental ability

	Estonian sample			American sample		
	Education	Occupation	Income	Education	Occupation	Income
SES index	0.44	0.44	0.22	0.47	0.31	0.22
Indicators of social origin						
Father's education	0.35	0.35	0.18	0.42	0.26	0.17
Mother's education	0.40	0.37	0.18	0.41	0.23	0.15
Father's occupation	0.38	0.37	0.19	0.40	0.28	0.16
Mother's occupation	0.39	0.37	0.18	0.33	0.25	0.16
Material well-being	0.15	0.19	0.15	0.28	0.21	0.19
General mental ability	0.47	0.39	0.28	0.60	0.45	0.31
Subtests of mental ability						
GATB: arithmetic reason.	0.39	0.32	0.23	–	–	–
GATB: vocabulary	0.50	0.43	0.23	–	–	–
GATB: 3-dimensional	0.22	0.16	0.17	–	–	–
AFQT: arithmetic reason.	–	–	–	0.54	0.39	0.31
AFQT: word knowledge	–	–	–	0.55	0.41	0.28
AFQT: paragraph comp.	–	–	–	0.54	0.41	0.25
AFQT: numerical operat.	–	–	–	0.50	0.38	0.26

Note: All correlations are significant at the 0.001 level. Missing data are deleted pairwise.

[4] To waste as little data as possible, missing data were deleted pairwise. Therefore, sample size is different for every correlation; it ranges from 782 (correlation between general mental ability and income in the Estonian sample) to 8603 (correlation between general mental ability and education in the American sample).

The correlations in Table 3 also allow us to make an important methodological observation. If we compare the correlations of combined indices with those of single variables, we see that the combined index of SES has stronger correlations with indicators of success than any of the single measures of social origin; therefore, the combined index is an improvement over the single measures used separately. The same is true for specific aptitudes and general mental ability in the American sample – general ability is a better predictor of success than any of the specific aptitudes. It does not seem to be so in Estonia, since here the Vocabulary test (i.e. verbal aptitude) has stronger correlations with education and occupation than general intelligence, but actually the differences between the correlations are not significant ($z = 0.90$, $p = 0.37$ [two-tailed], for correlations with education; $z = 1.09$, $p = 0.28$ [two-tailed] for correlations with occupation). Therefore, these results support the conclusion that general combined indices are better predictors of status attainment than single variables.

Table 4 presents a series of linear regression models that investigate social origin, mental ability and background variables as predictors of success in the two samples. There are three regression models for both countries; for every model unstandardized (B) and standardized (β) regression coefficients, significance levels (p), a measure of explained variance (R^2) and sample size (N) are presented. For the purposes of comparative analysis, it is useful to keep in mind that if we want to compare the impact of the same independent variable in different samples, then we should look at unstandardized coefficients, but if we want to compare the relative importance of different independent variables in the same model, then we should look at standardized coefficients (see Kline 1998).

The models I, II and III give us a simplified picture of the status attainment process, assuming that education is the first 'stage' of status attainment and income is the last one – model I investigates educational attainment, model II investigates occupational attainment, including education as one of the predictors, and model III investigates income attainment, including education and occupation as predictors[5] (see e.g. Sewell et al. 1969 for a similar analysis). These three models demonstrate that status attainment is a cumulative process – social origin and mental ability are the main determinants of education, education is in turn the main determinant of occupation, and occupation (along with gender) is the main determinant of income. SES and intelligence, therefore, have most of their influence on the status attainment process through education. This result is consistent with previous studies (e.g. Sewell et al. 1969).

If we compare the influence of mental ability in the two samples, then we can see that the effects are stronger in the United States for all three dependent variables. For instance, raising one's intelligence by a standard deviation (and controlling for other predictors) would give 3.53 additional occupational status

[5] Model III includes only the respondents who were working at the time the income measure was taken since it makes little sense to use last occupation to predict current income of the people who are not working. I ran similar regression models with all respondents, including the ones who were not working, and the results were very similar to the ones presented in Table 4.

Table 4. Linear regression - prediction of educational, occupational and income attainment

Independent variables	Dependent variables								
	Education (Model I)			Occupation (Model II)			Income (Model III) [a]		
	B	β	p	B	β	p	B	β	p
				Estonian sample					
Constant	10.15		***	–14.95			6.25		***
Age	0.06	0.02		–0.20	–0.01		0.10	0.10	*
Gender	0.76	0.16	***	2.38	0.07	**	–0.54	–0.36	***
Ethnicity	0.13	0.02		4.62	0.12	***	0.05	0.03	
Residence	0.05	0.03		1.20	0.10	***	0.03	0.05	
SES index	0.72	0.30	***	1.95	0.12	***	0.04	0.05	
General mental ability	0.83	0.36	***	0.56	0.03		0.09	0.12	**
Education				4.31	0.61	***	0.02	0.05	
Occupation							0.01	0.27	***
R^2	0.32			0.55			0.28		
N	791			771			524		
				American sample					
Constant	14.63		***	7.39		**	9.45		***
Age	–0.01	–0.01		–0.25	–0.03	**	0.01	0.02	
Gender	0.20	0.04	***	3.88	0.13	***	–0.47	–0.30	***
Ethnicity	–0.99	–0.21	***	–0.83	–0.03		–0.03	–0.02	
Residence	–0.10	–0.02		1.12	0.03	*	0.08	0.04	**
SES index	0.62	0.26	***	0.52	0.03	*	0.05	0.06	**
General mental ability	1.37	0.56	***	3.53	0.22	***	0.14	0.17	***
Education				2.55	0.39	***	0.04	0.10	***
Occupation							0.01	0.25	***
R^2	0.42			0.34			0.28		
N	4899			4239			3267		

[a] – only these respondents are included who were working at the time the income measure was taken.
* – $p < 0.05$, ** – $p < 0.01$, *** – $p < 0.001$

points in America, while in Estonia it would only be 0.56 points (see model II). The predictive power of SES, on the other hand, seems to be stronger in Estonia (though, in general, it is more equal in the two countries) – one standard deviation increase in SES would raise one's occupational status by almost two points in Estonia but only half a point in America (see model II).

Comparison of the relative importance of SES and intelligence shows that, in the American sample, the influence of intelligence is, at every step, stronger than that of SES – intelligence has a much stronger impact on educational attainment (model I) and manages also to have a much stronger impact on occupational attainment when education is controlled for (model II) and on income when both

education and occupation are controlled for (model III). In other words, it means that most people with high mental abilities get a good education but those who do not can still get a high-status occupation thanks to their mental abilities and those who do not get either good education or high-status occupation can still earn a lot of money thanks to their mental abilities (the same is also true for SES but to a much lesser degree). In the Estonian sample, SES and intelligence have a more or less equal effect on educational attainment (model I). As for occupational attainment, intelligence has no effect when education is controlled for while SES has a significant independent effect (model II), and as for income, the roles are reversed – intelligence has a significant effect, which is independent of education and occupation while SES has none (model III). Thus, while children of higher social background and higher intelligence both get a good education, those from higher background do not need a good education to get a prestigious job and those with higher intelligence do not need a good education or a prestigious job to earn a high income.

The analysis so far has tried to capture the linear relationships between independent and dependent variables. This analysis is problematic for at least two reasons, as already mentioned. First, a number of authors doubt if occupational status can be expressed in an ordinal and continuous fashion required by linear methods (see e.g. Erikson and Goldthorpe 1993). And second, it is not clear whether the kind of 'variable race' presented above (i.e. comparing the size of regression coefficients) is an appropriate method for investigating the relative effects of independent variables (King). According to Breen and Goldthorpe (1999, 2001) one should study class mobility instead of occupational attainment, that is, the movement of individuals between origin and destination classes, not the association between parental and own prestige level. According to these authors, the proper way to study the influence of social origin, mental ability and education on occupation consists of first "…*capturing the prevailing pattern of association between origins and destinations*", and then, as a next step, one should "… *introduce measures of individual ability /…/ and educational attainment and examine the effects of doing so on the parameters initially established. To the extent that these parameters shift towards zero, the association between class origins and destinations can be regarded as being mediated by the merit variables* [i.e. mental ability and education]" (Breen and Goldthorpe 2001:89).

To perform the kind of analysis on the PG and NLSY samples, I recoded father's occupation (class of origin) and respondent's own occupation (destination class) into Goldthorpe's class schema as described in section 2.2. It is convenient to start the analysis with simple cross-tabulations of father's and respondent's positions (see Table 5). This table can be first of all treated as a mobility table showing the frequencies of different origin–destination combinations, i.e. the intergenerational mobility in Estonia and the United States (including only cases for which data on intelligence are available). Although the cases are quite equally distributed over the table, we can still discern a tendency for children to end up in classes similar to their fathers'. Table 5 also presents the average mental abilities

for every cell in the table (for this analysis, general mental ability is standardized to have a mean of 100 and a standard deviation of 15), which allows us to get a preliminary idea of how much social mobility is mediated by intelligence. And indeed, we can see that the people who were upwardly mobile tend to have higher average abilities than those who were downwardly mobile. The differences are in many cases quite dramatic, which suggests a conclusion that upward or downward mobility depends, to a considerable degree, on mental ability.

Table 5. Crosstables of father's and respondent's class positions

Father's class			Respondent's class				Total
			I	II	III	IV	
			Estonian sample				
I	Higher service class	mean IQ	110.56	108.84	101.91	110.52	107.95
		N	46	38	29	8	121
II	Lower service class	mean IQ	110.54	102.64	102.43	99.86	104.55
		N	25	27	22	11	85
III	Routine non-manual,	mean IQ	108.58	104.38	96.31	89.96	99.24
	skilled manual	N	28	74	115	33	250
IV	Unskilled workers,	mean IQ	111.53	103.61	93.61	91.36	96.81
	farm workers	N	20	49	104	54	227
	Total	mean IQ	110.25	104.83	96.37	93.25	100.63
		N	119	188	270	106	683
			American sample				
I	Higher service class	mean IQ	117.83	114.82	111.45	105.57	113.50
		N	95	188	158	42	483
II	Lower service class	mean IQ	114.92	111.39	105.06	100.10	108.10
		N	149	361	360	124	994
III	Routine non-manual,	mean IQ	111.35	106.37	99.22	92.87	100.58
	skilled manual	N	154	468	917	406	1945
IV	Unskilled workers,	mean IQ	106.07	102.90	95.79	89.46	95.93
	farm workers	N	83	289	686	427	1485
	Total	mean IQ	112.83	108.20	100.01	92.84	101.99
		N	481	1306	2121	999	4907

Note: mental ability (IQ) is standardized (m = 100, SD = 15).

This conclusion cannot be verified without a more sophisticated analysis. Therefore, I will next use multinomial regression to conduct the kind of analysis suggested by Breen and Goldthorpe (2001, see above). Multinomial regression is a method for categorical dependent variables, it estimates the probability of getting into a specified category compared to the probability of getting into a reference category. I will use the third occupational group (routine non-manual and skilled manual workers) as a reference category. As before, three regression models are

presented for both samples; for every model logit coefficients, an index of model fit (Nagelkerke R^2) and sample sizes (N) are presented (see Table 6).

Table 6. Multinomial logistic regression - prediction of respondent's class position

Independent variables	Dependent variable: respondent's class (reference category – class III)								
	I	II	IV	I	II	IV	I	II	IV
	(model I)			(model II)			(model III)		
	Estonian sample								
Constant	4.66*	0.80	0.57	–0.16	–2.05	3.56	–12.91**	–8.50**	4.50
Age	–0.34**	0.01	0.13	–0.09	0.03	–0.10	0.06	0.03	–0.09
Gender	–0.97***	–0.46**	–1.63***	–0.63*	–0.06	–1.70***	–1.43***	–0.61*	–1.66***
Ethnicity	1.24	0.61**	–0.49*	0.87	0.67*	–0.26	0.77	0.79*	–0.24
Residence	0.19**	0.11	–0.35***	0.14	0.18*	–0.17	0.05	0.14	–0.17
Father's class									
I higher service	1.52***	0.68**	0.02	1.50***	0.43	0.27	1.02*	0.06	0.38
II lower service	0.93**	0.58**	0.20	1.32*	0.47	0.82	0.79	0.07	0.87
III routine, skilled	–	–	–	–	–	–	–	–	–
IV unskilled, farm	–0.12	–0.09	0.64***	–0.12	–0.23	0.63*	–0.15	–0.23	0.65*
Mental ability				0.89***	0.61***	–0.30*	0.28	0.14	–0.27
Education							0.91***	0.61***	–0.10
N	235	360	267	117	186	106	117	186	106
N (reference cat.)	516			268			268		
Nagelkerke R^2	0.26			0.34			0.55		
	American sample								
Constant	–2.46***	–1.87***	1.56***	–0.09	–0.29	0.26	–7.25***	–6.18***	1.95***
Age	0.02	0.05**	0.02	–0.06*	0.01	0.05*	–0.03	0.04*	0.04*
Gender	–0.53***	–0.08	–1.31***	–0.51***	–0.09	–1.25***	–0.55***	–0.13	–1.12***
Ethnicity	0.54***	0.19*	–0.38***	–0.34*	–0.36***	–0.04	0.06	–0.19	–0.12
Residence	0.35*	0.11	–0.34***	0.22	0.01	–0.26*	0.21	0.01	–0.26*
Father's class									
I higher service	1.15***	0.79***	–0.47*	0.48**	0.40**	–0.05	–0.11	–0.10	0.05
II lower service	0.77***	0.61***	–0.21	0.50***	0.43***	0.01	0.21	0.21	0.03
III routine, skilled	–	–	–	–	–	–	–	–	–
IV unskilled, farm	–0.28	–0.16	0.32***	–0.06	–0.07	0.27**	0.07	0.03	0.25**
Mental ability				1 .46***	0.80***	–0.50***	0.80***	0.31***	–0.39***
Education							0.45***	0.38***	–0.12***
N	494	1328	1011	476	1289	973	476	1289	973
N (reference cat.)	2172			2088			2088		
Nagelkerke R^2	0.15			0.28			0.37		

Note: Coefficients are logit coefficients. I – higher service class, II – lower service class, IV – unskilled and farm workers, III – routine non-manual and skilled manual workers
* – $p < 0.05$, ** – $p < 0.01$, *** – $p < 0.001$

Model I in Table 6 shows the influence of father's occupational group on respondent's occupational group, controlling for background variables. It can be seen that of the nine possible associations, five are significant in Estonia and six in the USA, which means that people are more likely to end up in classes similar to

their father's class than in a reference class. Mental ability is entered in model II. It has a positive effect on getting into categories I and II, and protects against falling into category IV. But it does not have much depressing effect on the parameters of father's occupation in the Estonian sample; in the American sample the effect is considerable, though the effect of father's class still remains significant. The influence of class of origin is, therefore, not completely mediated by intelligence in either countries. Adding respondent's education in model III has a noticeable effect in both samples – the influence of father's class (as well as that of intelligence) is further reduced and, in the end, only two parameters remain significant in the Estonian sample and one in the American sample. In Estonia, those whose fathers were of higher service class still have a good chance of ending up in the same class irrespective of their personal intelligence or education, and those whose fathers were unskilled or farm workers find it hard to leave this category irrespective of their intellectual and educational level; in America, only the latter association remains significant. It can be concluded that, based on the logic of Breen and Goldthorpe (1999, 2001), social mobility is to a large extent, but not completely, mediated by intelligence and education (the 'merit variables' according to Breen and Goldthorpe) in both countries.

4. Conclusions

The present paper analyzed the determinants of educational, occupational and financial success in Estonia and the United States. The main improvement of this paper over the previous ones was the inclusion of mental ability among the predictors of success in Estonia. It was hypothesized that mental ability, as well as its main 'competitor', social origin, have a positive impact on success in both countries. The hypothesis was supported. This paper, therefore, repeated the findings of many previous studies about the positive impact of intelligence and social origin in America. It also confirmed the results of earlier analyses, which have shown that, despite the radical social transformations of Estonian society in the past decades, the cards have not been completely reshuffled and parental status during Soviet times has a significant influence on their children's social status in capitalist Estonia. But most importantly, it showed that mental ability is also a strong predictor of success in Estonia. Indeed, it seems to be the strongest predictor of educational success (see Table 4, model I) and one of the strongest predictors of income along with gender and occupational status (see Table 4, model III). Thus, it can be concluded that the most intelligent people in today's Estonia are also among the best-educated and highest-earning ones.

The second aim of the paper was to compare the impacts of intelligence and social origin in the two countries and thereby evaluate the openness (or level of meritocracy) of Estonian society against the American society. The results showed that, although mental ability is an important determinant of success in Estonia, it does not seem to be as important in Estonia as it is in the United States. The results

for the American sample showed that, as a predictor of success, mental ability outcompetes social origin for every criteria (see Table 4). The results of the 'variable race' are much more even in the Estonian sample, and indeed for occupational attainment they seem to be in favor of social origin. If we take the predictive power of mental ability to be the measure of meritocracy (as is done by Saunders 1995, 1997), then it would seem that America is more meritocratic than Estonia. The analysis of social mobility in Table 6 further demonstrated that, although the process of mobility is, to some extent, mediated by intelligence in both countries, the mediating effect is stronger in America and, thus, the level of meritocracy is lower in Estonia.

These differences in results cannot be easily attributed to methodological differences between data-sets since a number of steps were taken to assure that the variables used in this paper were measured in a similar manner (e.g. the mental ability measures were derived from similar test batteries, occupational status measures were based on the same indices, etc.). It is also important that both studies were dealing with the same period from people's life-course – the 14 years between ages 18 and 32. Based on these methodological similarities and the fact that both data-sets are representative of a large part of respective populations, it seems necessary to conclude that the differences stem from differences between the two societies.

For some reason, American society provides more opportunity for intelligent people to be successful and somewhat less opportunity for intergenerational transmission of social advantage than Estonian society. One possible reason for this difference is the stability of the two societies. Although it was speculated above that the relatively unstable and harsh social environment of Estonia during recent decades might rise the importance of mental ability in status attainment, it seems that actually the opposite is true – stable and open social environment in America seems to provide better conditions for people to fully use their intellectual capabilities in the labor market and, possibly, for the formation of cognitive elite (as suggested by Herrnstein and Murray 1994). If this is true, then the advantage of being intelligent should grow in Estonia as society matures and becomes more stable. Hopefully, future longitudinal studies will address this question. This study has demonstrated that a comprehensive treatment of inequality and career success in Estonia is not possible without taking account of people's mental ability.

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