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ABSTRACT

In this paper we use register data to investigate social stratification within fields of study and university institutions in Denmark. We argue firstly, that it is important to utilize a relatively detailed classification of parents' occupation, in order to single out how students are endowed with different resources, even when their parents would normally be characterized as belonging to the same class. Secondly, we distinguish between disciplines as well as between university institutions in explaining the dynamics of inequality in the Danish University system. Several dimensions are found to be important: the degree of social stratification in different fields of study − separating classical from more vocational disciplines − and the degree of social stratification prevalent at the university institution − whether it has a liberal arts university profile or one that favors more applied subjects.

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INTRODUCTION

In most countries, no matter the type of welfare regime, there continues to be a political consensus on the importance of striving for equality of access to education. The chief and most important challenge in this endeavor has been posed by the fact that the further up in the educational hierarchy we move the more socially exclusive access becomes. As numerous studies show, access to higher education is not equal for all (for an overview, see Alon 2009; Gerber and Cheung 2008; Shavit Arum, and Gamoran 2007).

Equality of access to education is seen as an asset for many reasons. From a legal and democratic perspective, society is perceived to be more just if social positions are not ascribed but achieved by merit through equal opportunities in the educational system. A just society is also a society that has a representative distribution of social backgrounds across the more and less powerful social positions in society. From an economic point of view, the arguments for merit-based access is that it is economically most efficient to let the most able acquire the education that suits them best. Here, human capital theory also stresses that the individual should be able to maximize his or her educational investment, and that, through the education of individuals, society should be able to maximize its educational investment (Becker

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1964). In short, whether concerned with social justice or the nations' economic competitiveness (or both), equal opportunities are favored by the vast majority.

Adherence to these aims explains why widening participation in higher education has long been on the educational agenda in many countries. Participation in higher education can broaden, for instance, if an overall increase in the number of higher education institutions leads to widened participation, simply because a larger share of a youth cohort attends higher education. However, if the gap between participation rates of social groups remains the same even though education participation rates rise for all groups, then inequality has been maintained – something Raftery and Hout (1993) call 'maximally maintained inequality' (MMI). However, widened participation can also refer to an interest in broadening access across different fields of study, programs, and institutions – including the highly socially selective ones. This would be the case if increased access rates led to less pronounced educational stratification within higher education programs and higher education institutions. The opposite effect would be the case if less privileged groups were systematically channeled towards certain institutions and programs or fields of study despite this leading to a reduction of absolute inequality. In this case, inequality at the higher education level would effectively have been maintained – in Lucas (2001) terms named 'effectively maintained inequality' (EMI).

In this paper we investigate access to university institutions in Denmark – an interesting case, comparatively, because there are no tuition fees in higher education and because students are automatically granted relatively generous government subsidies for the stipulated time of the higher education programs (in

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2011: 740 Euros per month for the duration of the program studied, with the possibility of one additional grant year). As is the case in most other countries, the number of students attending university education in Denmark has multiplied tenfold over the last 60 years (from approx. 13,000 to 120,000 in 2011), and the number of university study places available per 20-year-old has more than doubled since 1979. Today it is expected that 54% of all young people in Denmark will complete a higher education degree course (compared to an OECD average of about 40%) (OECD, 2010, p. 58). Five per cent will graduate from business academies (short cycle programs), 25% from university colleges (medium cycle programs primarily for teachers, nurses, child care or social workers) and 24% from university institutions (long cycle courses with a range of traditional and professional programs). It is against this background that we ask: *What does such a massive increase in study places mean for the social distribution of students in the various fields of study and university institutions? Do certain fields of study and institutions remain exclusively for those class fractions endowed with the resources needed to enter into these programs*? Here, we add to existing research by operating with a more detailed level of field of study than is conventionally used, by differentiating between individual university institutions, and by making use of a relatively detailed classification of parents' occupational status. Cultural capital theory (Bourdieu 1984, 1986) and theories of micro-classes (Weeden and Grusky 2005, 2012) suggest that it is important to operate with a relatively detailed occupational classification, because different social groups and professions form distinctive social communities, endowing their offspring with unique resources and dispositions in the struggle for education and for the social positions it gives access to. Here we believe a focus on

stratification in higher education is warranted because we view access to higher education as a social battle over scarce goods; namely highly sought-after, prestigious programs that will lead to privileged positions in society – be it through the privileged possession of economic, cultural, organizational or communicative power.

INSTITUTIONAL SETTINGS

Tables 1 and 2 provide a rough outline of the socio-demographic profiles of the university students by institution and field of study. Table 1 shows the distribution of selected background variables on the student's choice of university field of study. The share of ethnic minority students is highest within the fields of health and business, indicating that ethnic minority students favor professional and vocationally oriented programs. Female students are underrepresented in the natural/technical sciences and overrepresented in the health sciences, a pattern similar to that in many other countries (Barone 2011). Regarding the highest educational qualification attained by parents, the most marked difference is that students in the field of business studies have a relatively high proportion of parents with vocational training as their highest attainment and a relatively low proportion of parents with a university degree. For students within the field of health sciences (made up mainly of students in medical programs), the opposite is the case.

Table 1 about here

Table 2 depicts various characteristics of university institutions and the distribution of selected background variables on choice of university institution. In 2006, there were

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10 major university institutions in Denmark, the two old universities of Copenhagen (KU) and Aarhus (AU) along with the younger universities of Odense (SDU), Aalborg (AAU) and Roskilde (RUC) dating from the 60's and early 70's. These are all multi-faculty universities. There are also the older mono-faculty institution of the Technical University of Denmark (DTU), along with the Danish School of Pharmacy (DFU), the Royal Veterinary and Agricultural University (KVL), and two Business Schools (Aarhus School of Business, ASB, and Copenhagen Business School, CBS). Additionally, there are a number of higher education institutions for the creative arts; a School of Architecture in Copenhagen and Aarhus respectively, along with seven smaller arts and music conservatories (all merged together in the 'creative arts institutions' category in Table 2).

The upper part of Table 2 shows how different fields of study are shared among these institutions. Just below we have identified each institution's share of applied programs using Biglan's distinction between pure and applied subjects (Biglan 1973). As the table shows, there is a varied distribution of applied programs among multi-faculty universities (KU, AU, SDU, AAU and RUC), while the mono-faculty institutions (DTU, DFU, KVL) and the Business Schools (CBS, ASB) are all exclusively applied.

The table also lists the percentage of study places in each institution that require a high school Grade Point Average (GPA) of 9 or more as a condition for admission. In Denmark, programs in great demand will require a relatively high GPA for entry. The more the demand for study places in a specific program exceeds the supply, the higher the GPA needed for entry.[1] As the table shows, the most selective universities are the University of Copenhagen, the Royal Veterinary and Agricultural

University and Aarhus University. The University of Southern Denmark also has 16% of study places that are selective (these are almost exclusively within the medicine program, requiring a very high GPA).

Table 2 about here

The gender distribution in Table 2 follows the same logic as in Table 1. There is a majority of male students at Aalborg University (which has several large engineering programs), as is the case at the Technical University of Denmark. Otherwise, women dominate – especially at the Royal Veterinary and Agricultural University and the School of Pharmacy. The latter also has by far the highest proportion of non-western students.

With respect to the level of parental education, students with parents with vocational training are predominantly found at Aalborg University, Aarhus School of Business and University of Southern Denmark – non-Copenhagen institutions with a high share of applied programs and requiring a lower GPA for entry. The same institutions have low proportions of academic parents, while the metropolitan institutions (CREA, DTU, KU and RUC) have the highest proportions.

LITERATURE REVIEW AND THEORETICAL POINT OF DEPARTURE

As mentioned above, there are no tuition fees in Danish higher education, and students are automatically granted relatively generous government subsidies while studying. Other things being equal, this would suggest that equality of access to

higher education in Denmark would be greater than in other welfare regimes. While some researchers have found that educational mobility in Scandinavia is somewhat higher than in other welfare regimes (Esping-Andersen 2007), others have noted the still persistent inequality in a country like Denmark, where economic capital is believed to play only a minor role, and have argued that this is evidence of the immense importance of cultural capital in young people's upbringing (Jæger 2009).[2] Internationally the sociology of higher education has been a fast growing field (for overviews, see Gerber and Cheung 2008; Stevens, Armstrong and Arum 2008; Grodsky , Jackson 2009). The continuing importance of family background in access to higher education is well-documented both internationally (see Shavit et al. 2007) and in Denmark (Benjaminsen 2006; Karlson 2011; [Author] 2007). Research in this field has focused mainly on vertical educational mobility, and recent Danish studies show that vertical mobility has increased from 1985 to 2005, implying that enrolment at the university level is, albeit still unequal, now less dependent on family background than it was earlier, especially for women from a lower socio-economic background ([Author] 2012).

The internal, horizontal social stratification *within* higher education (differences in access to specific programs) has received less attention in the research literature. Of central importance here is the discussion as to whether the development of mass higher education (Trow, 1972) has led to genuine social mobility, or whether relative inequalities have maintained their differentials. While the rising share of a youth cohort attending higher education will, not surprisingly, often increase social mobility on the general level (Kivinen, Hedman and Kaipainen 2007; Shavit et al. 2007), some (e.g. Boliver 2011) find that relative inequalities persist and that

inequality has been maintained maximally (between educational levels) as well as effectively (between different types of education within educational levels). According to Karen (2002), this is due to the increased competition for access to elite institutions. Triventi (2011), comparing eleven European countries, argues that horizontal inequalities and institutional differentiation in higher education is more pronounced in countries with a high proportion of tertiary graduates − implying a stronger competition among graduates in the labor market and consequently influencing occupational outcomes. In another recent study Hällsten (2010) finds support for the effectively maintained inequality theory in the case of Sweden. He states that horizontal stratification in higher education is a significant factor in social reproduction, and finds that class background affects higher education program choice, which in turn later contributes to inequalities in the labor market.

A number of papers focus on the possible *diversion* of first-generation students into less prestigious higher education programs. In their introductory notes, Shavit et al. (2007) do not find much support for any diversion even though other studies seem to find some support for this (Ayalon and Yogev 2005; Astin and Oseguera 2004; Becker and Hecken 2009). Davies and Guppy (1997) examine the relationship between SES, academic ability, chosen field of study and college selectivity. They also find that "[…] students from higher socioeconomic households and those with more cultural resources are more likely to enter selective universities and lucrative programs within selective universities" (p. 1433). Duru-Bellat, Kieffer and Reimer (2008) stress the importance of differentiating between *types* of higher education institutions (see also Espenshade and Walton 2009; Goyette and Mullen 2006). Also, [Author] (2012) shows that the historical increase in vertical mobility is

by no means evenly distributed horizontally; major differences in social origin in relation to choice of program as well as to choice of higher education institution exist. Hansen and Mastekaasa (2006) examine the relation between a Bourdieu-based capital-sensitive occupational categorization and students' grades at the beginning and end of their higher education program within 36 fields of study. They show that cultural capital matters in that children of the professional class get higher grades and that they increase their relative grade advantage over the course of their higher education program. Helland (2006) analyses the connection between SES and fields of study in Norwegian higher education. He finds that the reproduction of inequalities is not only hierarchical but also horizontal, pertaining to differences in cultural resources between different class fractions.

Zarifa (2012) using seven fields of study as response variable, finds social background effects for economically lucrative fields of study. Reimer and Pollak (2009) examine the expansion of higher education in West Germany 1983-1999 and find that, except for the socially exclusive fields of 'medicine and law', horizontal differentiation is not particularly visible between five fields, and further that differentiation between fields has not increased from 1983-1999. In the same vein a group of researchers (van de Werfhorst, Sullivan, and Cheung 2003) find that class only matters in choice of the relatively prestigious fields of 'law and medicine'. They argue that this might be because the data stem from an old 1956 cohort, and that the internal differentiation in today's mass universities will be far greater. Jackson et al. (2008) make a comparative examination of fields of study and intergenerational mobility. They do not find support for the need to differentiate between fields of study in relation to an OED model, but they have several reservations. One of these is

that their categorization of 'field of study' might be too imprecise, thereby concealing differences that would be revealed using more detailed categorizations. Indeed, Hällsten (2010) shows there is horizontal segregation in tertiary education and that it works through choices of specific degrees. He suggests that aggregation of programs into too broad categories of field of study might lead to biased, inconclusive results.

It is this argument we wish to investigate in the present paper and, as stated earlier, our premise is that research into social stratification in access to different higher education programs is justified when viewing access to higher education as a social battle over scarce goods. Here, Bourdieu (1996) would posit that the credential inflation that follows from an ever more highly educated population and from the battle of social groupings for university courses with high credentials will result in a process in which highly educated, affluent families will maintain their privileged access to higher education by maintaining a privileged access to certain fields of study and university institutions (see also Collins 1979). This is essentially the argument put forward by Lucas, who posits that "[…] socioeconomically advantaged actors secure for themselves and their children some degree of advantage wherever advantages are commonly possible" (Lucas, 2001: 1652). Hence, if they can no longer gain educational advantage by moving up the educational levels, the socioeconomically advantaged families will seek out 'qualitative' (horizontal) educational advantages within the educational level, leading inequality to be effectively maintained (EMI). These arguments have a parallel assumption, most notably put forward by Brint and Karabel (1989); that first generation students are diverted into specific less prestigious, vocationally oriented programs. Students from the most privileged backgrounds are subject to quite another form of channeling,

when they are directed towards the most prestigious higher education institutions (Espenshade and Walton 2009, Karabel 2005). Here, relative risk aversion theory (RRA) would stress that the potential propensity of working-class students to favor less prestigious, applied programs, is due to the fact that these educational choices are viewed as less risky in terms of future outcomes (see Breen and Goldthorpe 1997). Boudon (1974) argues that different class origins will produce different cost-benefit calculations, leading children from higher educated families to be less risk-averse when it comes to program length and type than their working-class counterparts. From a field-theoretical perspective, these micro-sociological rationales would be viewed more as structurally limited choices. Bourdieu (1996) regards higher education institutions as a field where families compete for attractive social positions mediated by gaining access to prestigious higher education programs. The educational strategies of families with large amounts of cultural capital will be to seek out and monopolize specific and, in their view, sought after institutions, courses and programs in the higher education system (Ball 2003; Bourdieu 1996). Concomitantly, children from these families will, vis-à-vis the socialization processes in the family, be disposed towards choosing these programs. As an outcome of the social struggles in the higher education field, some families will inhabit the less dominant positions; the types of institutions and programs in which students from lower educated homes will statistically be found. Here, Lareau (2011) has proposed some useful concepts in order to understand the socialization processes in the families, leading first- and second-generation students to be endowed with unequal resources when it comes to choice of educational pathways; working-class families will tend to adopt a child-rearing technique of 'accomplishment of natural growth', with an unquestioning

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respect for school and school officials and less involvement in structuring the child's everyday activities. Middle-class families will often make use of the child-rearing technique of 'concerted cultivation', in which parents support and structure their children's activities in and out of school, foster their communication skills, and have a high degree of interaction with the child's school. An important point made by Lareau is that it is often the mothers, regardless of social class that are the principal agents in familial educational matters.

RESEARCH HYPOTHESES

In this paper we examine horizontal stratification in a) fields of study, and b) university institutions. We investigate relationships between educational choice and social origin, using detailed classifications of parents' occupational status. First, we state that choice of field of study is stratified by parents' education and occupation. Other things being equal, first-generation students will aim at programs that are more instrumental and applied and therefore match students with a strong orientation towards future job possibilities. Second, we expect that inequality in access is to a large extent also institutional – it is a competition over study places in the field of higher education, a competition that will favor second-generation students and be more intense in metropolitan areas and for institutions with prestigious programs. Thirdly, we want to investigate the respective roles of mothers and fathers as primary executors of class-specific educational strategies. We would suggest that, with the development of an increasingly complex educational system, the families' educational strategies are of increasing importance, and in contemporary familial upbringing and communicative interaction, mothers may be the prime facilitator and

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the active parent in educational choices. Lastly, we also posit that working-class students seek specific programs because of their applied nature and not simply because they are the only ones they can gain access to because of their statistically relatively low GPA.

DATA, VARIABLES, AND METHOD

To investigate these relationships we set up two different multinomial logit models. First, we test a model with a 14-level field of study as dependent variable. Secondly, we investigate if we gain additional important information by separating university institutions. One model might potentially conflate differentiations that might be revealed in the other model. We use register data on all individuals born in 1984 (54,734 observations) and their university enrolment status at age 24 (in Denmark, the vast majority pursues a bachelor's as well as a master's degree, and will still be enrolled at the age of 24). For fields of study we pursue a more detailed categorization than that presented in Table 1. Drawing on Biglan's (1973) taxonomy, we break the major fields of study down to smaller units, distinguishing for instance between Soft Social Science and Hard Social Science programs, between Soft Natural Science, Hard Natural Science and Technical Science programs, and between Business Economics and Business Language programs (see also Hällsten 2010). For the university institutions we use the same university categories as in Table 2. The register variables used as explanatory variables have been re-coded on the basis of a large number of preliminary alternative model specifications. The explanatory register variables are based on Statistics Denmark register data from 2000 (when the respondents were 16 years old), unless otherwise specified. A series of dummy

variables are used to control for family and individual background differences: Female; Non-western − all immigrants or descendants of immigrants from non-western countries; Urban − capturing all students living in either Copenhagen or Aarhus when they were 16 years old (the two largest cities in Denmark); and nuclear family – all individuals living with both parents in 2000. The ages of both parents are included as a numeric variable. Family income is measured as the combined gross income of parents divided by DKK 100,000 (approx. 15,000 euros). Parental education is captured by an ordinal variable with 5 categories: Primary School; Gymnasium (High School); Vocational Education and Training (VET); Short or intermediate higher education (business academies and university colleges), and longer higher education (universities). A categorical variable for parents' occupation is used for each parent. The categories are constructed on the basis of the International Standard Classification of Occupation, ISCO, and coded in a way that enables the separation of groups with different resources or capitals, especially within the higher classes, taking into account the importance of the occupations' distinctive socialization patterns (Bourdieu 1986, Nordli Hansen 2006; Weeden and Grusky 2005). Here, fathers' occupations are divided into 13 categories, while some of the occupational categories have been merged for mothers, stemming from the fact that mothers' occupations are more homogeneous.

RESULTS

In Table 3 we present a multinomial regression analysis of choice of field of university study (base category represents those who did not enter university). We have adapted a 14-level categorization of fields of study:

1. Humanistic-artistic programs (such as literature, arts, and theater studies)

2. Classical humanistic programs (such as philosophy, history, and language)

3. Creative arts programs (primarily the architecture program and music conservatories)

4. Journalism, media and communication programs

5. Soft social science programs (such as sociology, psychology and anthropology)

6. Hard Social Science programs (such as economics and law)

7. Business Economics programs

8. Business Language programs

9. Soft Natural Science (biology, geography, etc.)

10. Hard Natural Science (physics, mathematics, chemistry, etc.)

11. Technical sciences (mainly engineering)

12. Agricultural programs

13. Medicine and dentistry programs

14. Other health programs (public health science, pharmaceutical programs)

First of all, with the exceptions of business economics, hard natural science and technical sciences, it is apparent that women generally are more likely to enroll in a university program, especially in business language, agricultural studies, and other health programs (see e.g. Barone 2011). Other things being equal, non-western immigrants are much more likely to take business programs as well as medicine, dentistry and other health programs than other 24-year-olds.[3] In Denmark, especially

the dentistry and pharmacy programs have a high share of students of non-western origin. High family income also increases the likelihood of studying medicine, hard social sciences and business economics. Students in these programs will often have economically well-off parents or parents employed in highly paid jobs in the medical professions.

table 3 about here

Because we want to investigate the significance of specific resources present in the children's social origin, we use the above-mentioned categorization of parental occupations to allow for the identification of different forms of capital (Bourdieu 1986), especially if one or both parents have further or higher education. On the overall level, the odds of attending university are higher for students with parents holding professional positions.[4] Students with fathers in the teaching professions are most likely to enter humanistic-classical and creative programs. Also, students with fathers in the arts and social science professions are much more likely to enter humanistic-classical programs, whereas students with fathers in science professions are more likely to study technical programs and creative programs.[5] If the student's father is employed in sales, finance, business, administration, they are somewhat more likely to study journalism, media and communication programs, as well as business programs. If fathers are managers, their off spring will more often enter journalism, media and communication programs as well as agricultural programs –

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which might be explained by the fact that these programs has a relatively entrepreneurial profile.

In general the children of mothers in occupations requiring a higher level of education are most likely to enroll in creative programs, medicine and soft social science. Students whose mothers work as teaching professionals are especially likely to take these programs and in general this factor increased the likelihood of them being enrolled in humanistic programs.

As to the parents' education, generally, the higher their qualifications, the greater the chances of their children studying at university. The effect is most pronounced in medicine, the humanistic-classical disciplines, and in the soft social sciences, and least pronounced in the business language programs. Except in the business programs and technical programs, it is interesting that mothers' educational level generally seems to matter more than fathers'. This might be an indication of the increasing importance over time of mothers' educational level for issues of educational mobility, indicating perhaps that mothers are becoming the prime facilitator and more active parent in educational choices. However, we should be cautious about drawing conclusions based on one model alone, and the literature on the role played by mothers' is inconclusive (Holmlund, Lindahl, and Plug 2011).[6]

It is interesting that children are very likely to study business economics, hard social science and medicine if their parents have high incomes. While parents' education and occupation generally matter for university attendance, this is least pronounced in the business economics and even more so in the business language programs − which in Bourdieu's terms corroborates the view that this is a field where economic capital prevails, and relatively larger numbers of first-

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generation students will pursue a program within these fields of study. The Bourdieusian interpretation of this difference would be that families of students enrolled in business studies programs have relatively low amounts of cultural capital, and these families' reproduction strategies are concomitantly more connected to the economic sphere − education does not hold the same prominent role here as in academic families. The parallel explanation favoring the relative risk aversion terminology would be that these first-generation students will tend to prefer applied-oriented programs with good prospects for future income, such as the business programs (see also [Author], forthcoming).

Utilizing a relatively detailed categorization of fields of study, we are able to see differences between disciplines normally collapsed into larger fields of study; one case is the business programs − where family income matters a lot more for the business economics students than for the business language students. We can also see that the student profiles of the hard and soft social science programs differ: relatively speaking, economic capital matters more when choosing hard social science programs, while cultural capital tends to matter more when choosing soft social science programs. Medicine students seem to have grown up in homes with large amounts of both economic and cultural capital − high parental income along with high parental educational level yields higher odds of studying medicine (and dentistry) − and this is significantly different from the other health programs.

In terms of conspicuous internal stratification in social selectivity within university institutions, we hence find that it is fruitful to utilize a detailed categorization of fields of study. Even though we cannot analyze choice of disciplines in relation to end destinations - on average, Danish higher education master students

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graduate at the age of 28 - it is interesting to compare these findings to some of the above-mentioned studies examining field of study differences. As discussed earlier, Reimer and Pollak (2009) and Jackson et al. (2008) do not find much support for including field of study in mobility models – the latter study having some reservations suggesting that "[…] field of study and social class are too aggregated to identify the patterns of interest" (Jackson et al. 2008: 384). Here, Hällsten (2010) details what he terms horizontal segregation in tertiary education and later outcomes, and disputes the use of broad categories of field of study.

Whether interested in horizontal stratification in education or in later outcomes, we might conclude that highly aggregated fields of study like the 5-7 categories often used in the literature may be too imprecise a category (conflating important differentiations) in societies where the educational level is generally rising and where differentiation can be expected to move upwards in the education system. In addition to this, our analysis reveals useful results from operating with a relatively detailed level of parental occupation, which takes into account the identification of different parental resources within otherwise normally aggregated class-categories.

In the next model we differentiate between specific university institutions, because we expect that institutional differentiation might be an additional important factor in horizontal stratification in higher education.

Table 4 about here

Table 4 presents the results of a multinomial logit analysis of the effect of various background variables on entering university institution in 2008 (again, base category is those who did not enter university). As table 3 showed, female students are

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generally more likely to be enrolled in university institutions than male students, with the unsurprising exceptions of the Technical University of Denmark and Aalborg University. As choice of fields of study indicated in Table 3, we observe that students of non-western origin are more inclined to study at the School of Pharmacy and the Royal Veterinarian and Agricultural School, and at Copenhagen Business School – institutions that almost exclusively offer applied programs.[7]

Turning to parental income, we can see that increase in family income will render students more likely to enter the business schools in particular, whereas the impact of family income is lower at Roskilde University. A plausible explanation may be that this university, consisting essentially of social science and humanities programs, recruits students mainly from the 'cultural' middle class, whereas the business schools recruit from families with large amounts of economic capital.

Turning to parents' occupation, having a father working as a machine operator or skilled craftsman increases the likelihood of attending Aalborg University, the Technical University and Aarhus Business School – all mainly offering applied programs. If fathers are found in highly skilled occupations in the arts or social sciences it generally increases the likelihood of enrolment at most university institutions. Children of fathers working in sales, finance, etc., or as legislators/senior officials are more likely to study at the business schools – which also appeared in Table 3 as propensities to study business programs. Children of fathers who are teachers are likely to study at creative institutions, while children of fathers working as technicians or science professionals are particularly likely to study at the Technical University of Denmark. Having mothers in arts and teaching professions particularly increases the likelihood of attending creative institutions or

Roskilde University. It is also interesting to see that, as in Table 3, maternal level of education generally has more 'additional' effect on university enrolment than that of fathers − especially on the likelihood of attending the liberal arts universities of Copenhagen and Roskilde.

We can additionally detect some noteworthy parental differences in occupation pertaining to what we tentatively might label 'traditional' marriage patterns (paternal education matters most) vs. 'modern' marriage patterns (maternal education matters the same or more than that of fathers): Relative to the mother, the father's occupation has more effect at Aalborg University, the Technical University of Denmark and the two business schools (a 'traditional' marriage pattern), while we see that maternal and paternal occupation have equal effect on enrolment likelihood at the University of Copenhagen and the University of Southern Denmark. Maternal occupation has more effect than paternal occupation at Roskilde University and the creative institutions (a 'modern' marriage pattern).

Overall, the difference between institutions seen in relation to levels of parental education level follows a clear order; universities with classic program profiles (liberal arts and creative institutions) being more socially selective, and universities with large proportions of utility- and applied programs being less socially selective. As they are less socially stratified, we might say that Aalborg University, University of Southern Denmark and especially the two Business Schools contribute most to the widening of access to Danish university institutions. There is, however, no reason to assume that this is an effect of deliberate pedagogical measures, direct targeting or affirmative action programs initiated by the universities themselves (Danish university institutions do not have affirmative action programs). These

institutions are less socially selective because they offer predominantly applied and less competitive programs (they do not require a high GPA to enter) and because some of them are sited in regions of Denmark where the average skill level of parents is relatively low. We might explain this in terms of straightforward propensities to take lesser risks when choosing programs, but nevertheless this pattern structurally represents a channeling of students from homes with relatively low socioeconomic status into institutions with certain applied degree programs.

The fact that working-class students opt for applied programs at institutions like Aalborg University and the business schools, all of which have relatively low admission criteria, prompts us to ask: Do working-class students choose to study the programs they can in fact get access to? Or do they make a strategic choice of applied programs? Put in another way, would first-generation students choose to enroll in highly selective programs like political science or literature studies at the University of Copenhagen, if they had the high school GPA required? Table 5 tries to shed some light on this. The table compares the choice of field of study made by students from different social origins with the same high school GPA. From Table 5 it can be seen that among students with a high school GPA above 9 (a relatively high GPA in Denmark), two and a half times as many working-class students as academic students will select business studies, and only half as many will select health science. Among students with a mediocre to low GPA of less than 8, working-class students select business studies more than students with academic parents, who on the other hand are twice as likely to select humanistic studies as working-class students. Although merely descriptive, this table fuels the argument that working-class students choose not only from what they can realistically

get access to but also according to what makes sense for them, what is the rational choice, given the dispositions their background endows them with; programs that are chosen because they are applied and vocational in the sense that they are means to an end; they are 'concrete', tangible, and provide useful qualifications in the pursuit of later well-defined job openings with the possibility of high returns.

Table 5 about here

CONCLUSION

If governments increase the number of university places and/or grant university status to an increasing number of educational institutions, this will almost automatically lead to an absolute broadening of participation in higher education. As Lucas (2001) claims, this will also lead privileged and more highly educated families to adapt to the changes in the higher education system and develop educational strategies to effectively maintain their privileged positions. Along with the inflation of credentials that is likely to follow from this, it will be increasingly important to examine how social selectivity creates differences in access to programs *within* the tertiary level; that is how access to higher education is horizontally stratified. This is what warrants an investigation into the horizontal stratification in higher education, and this explains why we have argued for the importance of looking at social inequality in access to different fields of study and institutions within the university level.

To address our first hypothesis, we initially tried out a 5-level categorization of fields of study, and we found that only business studies stood out as a field characterized by relatively more educational mobility than other fields of

study. In our present 14-level categorization, we find a range of conspicuous educational stratification patterns, leading us to support the reported reservations about working with too many disciplines/fields of study compressed into the same category, whether interested in horizontal stratification in education or in later outcomes. Our analysis also points to the added information gained when applying a relatively detailed level of parental occupation, thereby taking into account the identification of distinct parental resources within otherwise normally aggregated class-categories. Having parents with relatively large amounts of cultural capital (teaching and arts/social science professions) yields large odds of being enrolled in humanistic-classical programs, creative programs, soft social science programs, whereas having parents with relatively large amounts of science capital (science professions) yields large odds of studying creative and technical programs. Furthermore, there is a high chance of studying business economics, hard social science or medicine if your parents have high incomes. There are interesting nuances between related fields: the two Business studies still stand out as contributing most to educational mobility as they did in the initial analysis, but we also find that family income matters more for business economics students than for the business language students. Furthermore, relative to cultural capital, economic capital in the family matters more when choosing hard social science programs, than when choosing soft social science programs, where cultural capital matters more. Medical students comes from homes with large amounts of economic and cultural capital – both high parental income and education yields higher odds of studying medicine and dentistry – and this is significantly different from the other health programs. In terms of conspicuous internal differentials in social selectivity, we therefore find that it is fruitful to utilize

a detailed categorization of fields of study. However, stratification is also institutionally defined and to a large degree dependent on the university institution's geographical location in relation to where the student had been living at the age of 16. Here we address the second hypothesis. Competition will be more intense in metropolitan areas and in institutions with prestigious programs. We also find that differentiation is dependent on the proportion of vocational or applied programs offered by the university institutions. Other things being equal, first-generation students will aim at applied programs that match their instrumental attitude to education and strong orientation towards future job opportunities.

We can hardly view the stratification processes in the Danish university field as a question of a division between mass and elite universities. The differentiation we see may be better understood as a division between two opposites. On the one hand, there are the 'classical', non-vocational, liberal arts universities (including the law and medicine programs) and the creative institutions where we find students from homes in which the transmission of academic and cultural capital is the primary mechanism of reproduction. Here, children of parents who are, for instance, teachers or in arts and social science professions are likely to study at creative institutions and universities like Roskilde University. On the other hand, we have university institutions with vocational or applied programs, where we find utility-based programs like pharmacy and business studies, and where students are from homes in which education is important largely because it grants access to solid, well-paid and well-respected jobs. For instance, having a father occupied as a machine operator or a skilled craftsman increases the likelihood of attending institutions

mainly offering applied programs, such as Aalborg University, the Technical University and Aarhus Business School.

In the first group of classical liberal arts universities, we find families with 'modern' family patterns, where the effect of the mother's educational level is equal to or higher than that of the father on an offspring's university choice, whereas in the second group we find 'traditional' family patterns, where a fathers' educational background has more influence. Indeed, to address our third hypothesis, there is evidence here of the importance of the mother's educational background relative to the father's as regards their offspring's educational choices. This might point to increasingly important role played by mothers as primary executors of class-specific educational strategies and to changed familial socialization patterns, in which mothers are the prime facilitators in the process of educational choice. However, we have to proceed with caution here, since results in the literature concerning the effects of parental education are mixed (Holmlund, Lindahl, and Plug 2011).

This paper shows that at the university level there are various degrees of social selectivity by institution and by field of study. Here we could argue that a genuinely broadening participation in university education would require changed access patterns for some of the most selective institutions, just as it would require some of the students from highly educated homes to be channeled towards university institutions that were not a natural choice in terms of location or program – institutions that were, for example, regional and vocational. This could lead one to favor a change in the admission criteria away from a universalist system based on a high school GPA to perhaps a more refined admission system in the hope that working-class students would fare better if admission criteria were based on

applications, interviews, etc. However, studies of admission procedures and access to elite colleges cast doubt on the potential of qualitative admission criteria (see e.g. Espenshade and Radford 2009).

We shall now turn to our final hypothesis: that, working-class students, if they could choose freely, would prefer highly selective programs in the metropolitan institutions? As discussed earlier, Table 5 suggests that even working-class students with high GPA will favor specific vocational fields of study and applied degree courses compared to their peers from academic families. This has implications for how we address the problem of equal educational opportunities for all. Not only do we need to work towards a more equal distribution of the educational opportunities and of the resources that young people possess; we also need to discuss whether, from a normative point of view, it is a problem that talented first-generation students choose differently than their talented second-generation peers? We would be inclined to answer that it is. As long as recruitment patterns co-vary with social class origin, regardless of the shape these recruitment patterns may take, the reality of access to higher education continues to run counter to societal ideals of equality of opportunity, social mobility, and as demographically representative an educational and occupational structure as possible.

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[1] A small share of university places (about 10%) are reserved for applicants with alternative entrance qualifications. Danish universities do not have affirmative action programs directly targeted towards specific groups.

[2] However, [authors] have showed in a new study that family income very much explains results in two proficiency tests for an even more recent cohort born in 1995.

[3] These estimates might be skewed due to potential problems with missing background data on non-western students' parents (leading to an underestimation, for instance, of the educational level of the immigrant parents).

[4] We prefer to use the whole population as reference because we are interested in the inequality perspective; in the differences in chances of obtaining a university degree seen from the pre-school child's perspective, so to speak. However, we have run models with High School as references with and without GPA. While estimates are generally lower, conditioning at High School still shows

differences in social selectivity similar to patterns in the models presented, and these effects are visible even when controlling for GPA. Furthermore, when running models separately for male and female students, effects are generally more pronounced for females. Although the IIA property is a necessary condition for a correct specification of a multinomial logit model, it is to be expected that tests of IIA will fail when using the kind of response variables applied here. The feasibility of tests of IIA is, however, disputed. Dow and Endersby (2004) points to the fact that in many cases estimating substitution patterns is purely hypothetical; in practice, it is not relevant for us to imagine a hypothetical situation in which one higher education institution would be gone. The IIA may be relevant, but only in cases where the categories in the dependent variable may change easily (for instance, in candidates-centered elections, where candidates can be easily substituted). This, we might add, is further relaxed when we consider the model to be an approximation (Train 2009) and describe a preference structure in choice of higher education, not making causal and hence predictive statements on future choices. In our analysis of the model estimates, we also tested for significant differences between column estimates in the models, which were confirmed.

[5] This could be due to what Bourdieu would term reconversion strategies: the high likelihood of studying creative programs may be driven by architecture students with fathers working as engineers.

[6] Hovewer, studies by Beller (2009) and Mare and Maralani (2006) stress the importance of taking maternal education and occupation into account.

[7] As in model 1, there is a potential bias here in terms of background (missing data) of non-western students, perhaps underestimating the SES of immigrant parents.

Table 1: Field of study by student background characteristics

(%, column total)	Social sciences	Humanities	Natural or technical sciences	Health sciences	Business studies	Total for all fields
Field of study						
---**Ethnicity**---						
Non-western origin	3	3	3	9	6	6
Western origin	97	97	97	91	94	94
---**Gender**---						
Female students	62	59	40	70	52	55
Male students	38	41	60	30	48	45
---**Parents' highest education**---						
Primary School	5	4	4	3	6	5
Gymnasium	2	3	2	2	3	2
Vocational training	23	22	24	18	33	25
HE Business academy	5	6	7	6	8	7
HE University college	37	33	35	31	30	33
HE University degree (incl. PhD)	28	32	28	40	20	28

Note: Enrolled 24 year-olds at universities in 2008 (N=11 847). Own calculations using register data from Statistics Denmark.

Table 2: University institution by student background characteristics

(%, column totals)	KU	AU	SDU	AAU	RUC	DTU	DFU	KVL	CBS	ASB	CREA
Fields of Study											
Aesthetic/creative studies	-	-	-	-	-	-	-	-	-	-	100
Humanistic	-	39	26	23	44	-	-	-	-	-	-
Natural sciences	14	16	11	5	12	-	100	100	-	-	-
Health studies	19	16	18	-	-	-	-	-	-	-	-
Social sciences	28	27	9	21	44	-	-	-	-	-	-
Business studies	-	2	33	16	-	-	-	-	100	100	-
Technology studies	-	-	4	34	-	100	-	-	-	-	-
Share of applied programs											
	15	16	52	51	0	100	100	100	100	100	100
Share of study places that require a GPA of 9 or above as condition for admission											
	33	26	16	6	0	0	0	31	6	0	N/A
Share of all admitted students in 2005											
	31	21	14	11	8	6	1	3	13	6	N/A
Residence of student at age 16											
Copenhagen or Aarhus	44	36	9	17	43	37	41	27	46	38	36
Gender											
Female students	60	56	56	43	62	24	73	85	51	53	55
Ethnicity											
Non-western	5	3	8	3	3	4	14	1	7	3	1
Parents' highest educational level											
Primary School	4	4	6	6	4	2	6	4	5	6	4
Gymnasium	3	2	3	2	3	2	4	1	3	3	1
Vocational training	17	25	32	34	16	17	23	29	28	34	16
HE Business academy	6	6	10	8	6	6	5	6	6	10	7
HE University college	32	35	33	33	38	35	30	35	33	31	39
HE University degree, incl. PhD	39	29	17	17	33	38	32	26	26	16	33
Mean family income (DKK 100,000)											
Mean income	6.5	6.2	5.7	5.7	6.2	6.9	6.2	6.6	6.7	6.2	6.3
st dev	3.1	2.7	2.8	2.4	3.0	3.1	3.1	2.8	3.2	2.7	2.5
Geographical location (city size with capital as largest)											
	1st	2nd	3rd	4th	1st	1st	1st	1st	1st	2nd	N/A

Note: Enrolled 24 year-olds in universities in 2008 (N=11 847). Data derived from official university statistics, statistics from the central enrolment office and own calculations using register data from Statistics Denmark.

Table 3: Multinomial logistic regression. Field of study – odds ratios (RRR)

	Huma-nistic-artistic	Huma-nistic-classical	Creative arts	Jour-nalism, media and commu-nication	Soft social science	Hard social science	Business Econo-my	Business Langu-age	Soft natural science	Hard natural science	Technical	Agricul-ture	Medicine and dentistry	Other health
Female	2.14***	2.25***	1.49**	0.95	1.83***	1.45***	0.84***	3.04***	1.40***	0.56***	0.40***	6.94***	2.27***	4.37***
	(0.00)	(0.00)	(0.00)	(0.67)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Non-western immigrant	1.11	0.20**	0.47	0.60	0.62	1.52*	2.69***	2.35***	0.68	1.01	1.46	0.32	4.65***	4.58***
	(0.52)	(0.01)	(0.31)	(0.35)	(0.05)	(0.03)	(0.00)	(0.00)	(0.23)	(0.97)	(0.07)	(0.27)	(0.00)	(0.00)
Urban	1.07	1.13	1.17	0.92	1.08	1.26**	1.23***	0.97	1.24*	1.11	0.78**	0.90	1.04	0.98
	(0.24)	(0.33)	(0.27)	(0.54)	(0.25)	(0.00)	(0.00)	(0.75)	(0.02)	(0.25)	(0.00)	(0.54)	(0.68)	(0.87)
Mother's age	1.02**	1.04*	1.06**	0.99	0.99	1.01	1.02**	1.02	1.03**	1.00	1.00	1.04	1.01	1.02
	(0.00)	(0.01)	(0.00)	(0.70)	(0.44)	(0.35)	(0.00)	(0.07)	(0.00)	(0.90)	(0.83)	(0.07)	(0.47)	(0.13)
Father's age	1.04***	1.04**	1.02	1.04*	1.05***	1.03**	1.03***	1.04***	1.02	1.05***	1.05***	1.06**	1.02*	1.02
	(0.00)	(0.01)	(0.45)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.20)	(0.00)	(0.00)	(0.01)	(0.04)	(0.39)
Nuclear family	1.21*	1.60*	1.81*	0.77	1.13	0.88	0.98	1.24	1.00	1.17	1.50**	1.64	1.06	1.13
	(0.03)	(0.02)	(0.02)	(0.19)	(0.24)	(0.25)	(0.78)	(0.08)	(0.97)	(0.25)	(0.00)	(0.09)	(0.64)	(0.55)
Family income (100.000 DKK)	0.97	0.73	1.17	2.39**	1.52**	3.59***	4.16***	1.66**	1.64*	1.26	1.73***	2.30*	4.26***	2.47**
	(0.82)	(0.28)	(0.63)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.02)	(0.27)	(0.00)	(0.01)	(0.00)	(0.00)
Father's occupation (ref: Unskilled workers)														
Machine operators	1.10	1.96	1.46	1.00	1.05	1.34	1.15	1.17	1.39	1.20	1.32	1.01	1.09	0.81
	(0.56)	(0.11)	(0.45)	(0.99)	(0.81)	(0.17)	(0.36)	(0.43)	(0.22)	(0.50)	(0.20)	(0.99)	(0.76)	(0.60)
Skilled craftsmen	1.31*	1.24	1.30	1.40	0.96	1.55*	1.28	1.35	1.28	1.09	1.57*	1.30	1.05	1.38
	(0.05)	(0.58)	(0.55)	(0.33)	(0.82)	(0.02)	(0.07)	(0.09)	(0.28)	(0.72)	(0.01)	(0.52)	(0.86)	(0.30)
Skilled agricultural/ fishery workers	1.06	1.86	1.97	0.95	1.22	1.58	1.52*	1.47	1.47	0.89	2.02**	4.28***	1.70	1.49
	(0.78)	(0.21)	(0.22)	(0.93)	(0.42)	(0.07)	(0.02)	(0.12)	(0.22)	(0.75)	(0.00)	(0.00)	(0.07)	(0.34)
Sales, service and care work	1.33	2.46	2.62	1.28	1.14	1.88**	1.61**	1.18	1.06	1.90*	1.10	2.20	1.08	1.59
	(0.14)	(0.05)	(0.06)	(0.63)	(0.60)	(0.01)	(0.01)	(0.55)	(0.86)	(0.03)	(0.73)	(0.12)	(0.83)	(0.27)
Office workers	1.64**	2.12	0.61	2.31	1.14	1.54	1.42	1.21	1.68	2.32**	1.36	1.53	1.09	2.00
	(0.01)	(0.12)	(0.54)	(0.05)	(0.59)	(0.09)	(0.06)	(0.47)	(0.09)	(0.00)	(0.26)	(0.45)	(0.81)	(0.08)
Sales, finance, business, administration	1.59**	1.87	1.92	2.31*	1.92***	1.66*	2.17***	2.13***	1.71*	1.78*	1.42	0.18	1.77*	1.19

	(0.00)	(0.15)	(0.17)	(0.03)	(0.00)	(0.02)	(0.00)	(0.00)	(0.04)	(0.02)	(0.12)	(0.10)	(0.03)	(0.67)
Technicians and intermediate professionals	1.65**	1.87	2.27	1.54	1.49*	1.10	1.50**	1.61*	1.89*	1.84*	2.06***	2.85*	1.62	1.71
	(0.00)	(0.14)	(0.07)	(0.28)	(0.04)	(0.69)	(0.01)	(0.03)	(0.01)	(0.01)	(0.00)	(0.02)	(0.06)	(0.12)
Professionals – arts and social sciences	2.28***	5.41***	2.65*	2.85**	2.86***	2.11***	2.80***	2.94***	2.07**	1.62	2.04**	1.69	1.42	1.80
	(0.00)	(0.00)	(0.04)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.08)	(0.00)	(0.31)	(0.18)	(0.11)
Teaching professionals	2.03***	3.34**	3.33**	2.42*	2.25***	1.48	1.55**	2.10***	2.14**	2.62***	1.64*	2.20	1.89**	1.68
	(0.00)	(0.00)	(0.01)	(0.02)	(0.00)	(0.06)	(0.01)	(0.00)	(0.00)	(0.00)	(0.02)	(0.08)	(0.01)	(0.13)
Science professionals	1.75***	2.39*	3.10**	2.24*	2.13***	1.80**	1.93***	1.63*	1.79*	2.33***	3.12***	2.44*	2.31***	2.16*
	(0.00)	(0.03)	(0.01)	(0.03)	(0.00)	(0.00)	(0.00)	(0.03)	(0.02)	(0.00)	(0.00)	(0.05)	(0.00)	(0.02)
Managers	0.92	2.12	3.34**	1.65	1.18	1.43	1.74***	1.51	1.02	1.51	1.74*	2.94*	1.26	0.78
	(0.70)	(0.10)	(0.01)	(0.25)	(0.46)	(0.12)	(0.00)	(0.08)	(0.96)	(0.15)	(0.02)	(0.02)	(0.42)	(0.60)
Legislators, senior officials	1.80***	4.19***	2.24	1.87	1.91***	1.77**	2.26***	2.46***	1.75*	1.51	1.70*	2.86*	1.15	1.25
	(0.00)	(0.00)	(0.08)	(0.11)	(0.00)	(0.01)	(0.00)	(0.00)	(0.04)	(0.12)	(0.02)	(0.02)	(0.60)	(0.57)
Mother's occupation (ref: Unskilled workers)														
Machine workers and skilled craftsmen	1.04	0.56	0.90	0.49	1.42	0.91	1.16	0.86	0.61	0.81	0.58	2.19	1.01	0.42
	(0.86)	(0.41)	(0.91)	(0.22)	(0.24)	(0.75)	(0.42)	(0.52)	(0.21)	(0.48)	(0.07)	(0.12)	(0.99)	(0.13)
Skilled agricultural and fishery workers	1.29	1.22	2.58	0.88	1.42	1.25	1.05	0.93	0.80	0.62*	0.94	1.70	1.68	0.81
	(0.12)	(0.64)	(0.13)	(0.74)	(0.15)	(0.30)	(0.75)	(0.70)	(0.40)	(0.04)	(0.75)	(0.23)	(0.12)	(0.55)
Sales, service and care work and clerks	1.56**	2.41*	3.89*	1.05	2.20***	1.53*	1.70***	1.35	1.28	0.97	1.61*	1.87	2.61**	1.34
	(0.01)	(0.04)	(0.03)	(0.89)	(0.00)	(0.04)	(0.00)	(0.09)	(0.34)	(0.91)	(0.01)	(0.16)	(0.00)	(0.39)
Sales, finance and business administration	1.52*	0.85	3.71*	1.43	2.88***	2.55***	2.14***	1.56*	1.30	1.02	1.76*	1.21	3.51***	1.10
	(0.03)	(0.77)	(0.05)	(0.40)	(0.00)	(0.00)	(0.00)	(0.03)	(0.38)	(0.95)	(0.01)	(0.73)	(0.00)	(0.82)
Technicians and intermediate professionals	1.49*	2.03	4.61*	1.19	2.30***	1.44	1.47*	0.97	1.40	0.92	1.51*	1.02	2.95***	1.72
	(0.02)	(0.10)	(0.01)	(0.65)	(0.00)	(0.09)	(0.01)	(0.86)	(0.21)	(0.73)	(0.04)	(0.97)	(0.00)	(0.11)
Professionals arts and social sciences	2.47***	1.93	6.51**	2.24	4.37***	2.59***	2.12***	1.80*	2.08*	1.42	2.57***	2.63	3.21**	2.33*
	(0.00)	(0.18)	(0.00)	(0.07)	(0.00)	(0.00)	(0.00)	(0.02)	(0.02)	(0.21)	(0.00)	(0.07)	(0.00)	(0.04)
Teaching professionals	2.74***	3.93**	7.09**	1.89	3.85***	1.64*	2.09***	1.08	2.12**	1.13	1.85**	1.62	4.48***	2.16*
	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)	(0.03)	(0.00)	(0.74)	(0.01)	(0.63)	(0.00)	(0.32)	(0.00)	(0.03)
Science professionals	1.84**	1.68	4.26*	1.78	3.20***	2.34***	1.89***	1.19	1.88*	1.08	2.33***	3.12*	5.89***	2.43*
	(0.00)	(0.30)	(0.03)	(0.21)	(0.00)	(0.00)	(0.00)	(0.54)	(0.04)	(0.80)	(0.00)	(0.02)	(0.00)	(0.03)
Legislators and senior officials, managers	1.71**	2.02	3.61	2.71*	2.86***	1.89*	2.01***	1.06	1.45	0.81	1.00	1.67	2.30*	0.97

	(0.01)	(0.15)	(0.07)	(0.02)	(0.00)	(0.01)	(0.00)	(0.82)	(0.25)	(0.50)	(1.00)	(0.35)	(0.03)	(0.96)
Father's education (ref: Elementary school)														
High school education	2.03***	2.25*	3.33***	2.24*	1.46*	2.72***	2.36***	2.04***	2.65***	2.88***	1.27	2.23	2.14**	1.33
	(0.00)	(0.01)	(0.00)	(0.02)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.31)	(0.07)	(0.00)	(0.42)
Vocational education	0.98	1.27	1.38	1.10	1.02	1.08	1.40***	1.17	1.51*	1.48*	1.26	1.92*	1.13	1.03
	(0.87)	(0.30)	(0.24)	(0.69)	(0.83)	(0.52)	(0.00)	(0.18)	(0.01)	(0.02)	(0.07)	(0.02)	(0.47)	(0.89)
Short/medium higher education	1.49***	1.91**	1.81*	1.75*	1.29*	1.86***	1.81***	1.45**	1.62**	2.24***	2.13***	1.64	2.03***	1.68*
	(0.00)	(0.01)	(0.05)	(0.03)	(0.04)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.12)	(0.00)	(0.03)
Long higher education	2.53***	3.28***	3.35***	2.22**	2.14***	3.21***	2.26***	1.89***	2.99***	3.45***	2.85***	2.09*	4.38***	2.35**
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)
Mother's education (ref: Elementary school)														
High school education	2.75***	3.62***	2.18*	1.84	3.22***	1.86**	1.73***	1.70**	2.11**	2.81***	2.57***	1.10	2.83***	2.67**
	(0.00)	(0.00)	(0.03)	(0.10)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.86)	(0.00)	(0.00)
Vocational education	1.30**	1.51	0.90	1.50	1.71***	1.36**	1.36***	1.40**	1.41*	1.43*	1.57***	1.11	2.10***	1.50
	(0.01)	(0.08)	(0.69)	(0.07)	(0.00)	(0.01)	(0.00)	(0.00)	(0.03)	(0.02)	(0.00)	(0.68)	(0.00)	(0.07)
Short/medium higher education	2.32***	2.97***	1.63	2.02**	2.93***	2.13***	1.54***	1.78***	2.38***	2.24***	2.11***	2.77***	3.44***	1.86*
	(0.00)	(0.00)	(0.07)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Long higher education	3.67***	6.42***	2.86**	2.58**	5.48***	3.42***	1.81***	1.67*	4.09***	4.81***	2.63***	3.70***	5.69***	3.92***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

N	52726
pseudo R-sq	0.112
AIC	88766.78
BIC	94720.47

Categories for missing observations included.

* p<0.05, ** p<0.01, *** p<0.001

Table 4: Multinomial logistic regression. Choice of university institution – odds ratios (RRR)

	Aalborg University	Aarhus University	Creative arts institutions	Danish Technical University	Royal Veterinary and Agricultural University & Danish School of Pharmacy	Copenhagen Business School	Aarhus School of Business	University of Copenhagen	Roskilde University	University of Southern Denmark	Other smaller institutions
Female	0.86*	1.46***	1.46**	0.38***	4.50***	1.19**	1.30**	1.73***	1.92***	1.42***	0.88**
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Non-western Immigrant	1.15	1.08	0.36	1.97*	2.82***	2.99***	0.96	1.24	0.68	3.36***	2.16***
	(0.48)	(0.64)	(0.17)	(0.03)	(0.00)	(0.00)	(0.89)	(0.08)	(0.18)	(0.00)	(0.00)
Urban (Copenhagen and Aarhus)	0.48***	1.26***	1.17	1.13	1.10	1.77***	1.56***	1.47***	1.52***	0.21***	1.15**
	(0.00)	(0.00)	(0.25)	(0.27)	(0.42)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Mother's age	0.99	1.00	1.05***	1.04**	1.03*	1.02**	1.02	1.02***	1.02	1.02*	1.00
	(0.17)	(0.58)	(0.00)	(0.01)	(0.02)	(0.01)	(0.17)	(0.00)	(0.13)	(0.03)	(0.65)
Father's age	1.04***	1.04***	1.03	1.05**	1.03*	1.05***	1.02	1.04***	1.04**	1.02*	1.00
	(0.00)	(0.00)	(0.12)	(0.00)	(0.05)	(0.00)	(0.09)	(0.00)	(0.00)	(0.01)	(0.54)
Nuclear family	1.32**	1.40***	1.63*	1.30	1.26	0.91	1.55**	0.90	0.98	0.96	0.95
	(0.01)	(0.00)	(0.03)	(0.14)	(0.21)	(0.35)	(0.00)	(0.14)	(0.84)	(0.67)	(0.42)
Family income (100,000 DKK)	0.97	1.37**	1.09	2.68***	2.69***	4.49***	2.31***	2.29***	1.80**	2.10***	0.52***
	(0.87)	(0.01)	(0.78)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Father's occupation (ref: Unskilled workers)											
Machine operators	1.47*	1.16	1.33	0.59	1.34	1.01	1.44	1.01	1.02	1.16	0.92
	(0.02)	(0.31)	(0.53)	(0.37)	(0.36)	(0.97)	(0.14)	(0.97)	(0.94)	(0.32)	(0.44)
Skilled craftsmen	1.49**	1.16	1.11	2.75**	1.55	1.19	1.55*	1.18	1.02	1.18	1.07
	(0.01)	(0.23)	(0.79)	(0.01)	(0.12)	(0.30)	(0.05)	(0.22)	(0.94)	(0.23)	(0.46)
Skilled agricultural/ fishery workers	2.23***	1.88***	1.83	1.41	3.01***	1.46	2.51***	0.79	0.61	0.97	0.93
	(0.00)	(0.00)	(0.23)	(0.51)	(0.00)	(0.10)	(0.00)	(0.27)	(0.28)	(0.89)	(0.71)
Sales, service and care work	1.41	1.21	2.13	1.65	1.61	1.46	2.28**	1.95***	1.51	0.72	1.06
	(0.11)	(0.29)	(0.12)	(0.34)	(0.23)	(0.10)	(0.00)	(0.00)	(0.21)	(0.18)	(0.72)
Office workers	1.43	1.41*	0.74	2.29	1.73	1.20	1.12	2.02***	1.67	1.43	1.17
	(0.10)	(0.05)	(0.66)	(0.08)	(0.15)	(0.44)	(0.73)	(0.00)	(0.10)	(0.07)	(0.31)
Sales, finance, business, administration	1.72**	1.63***	1.54	2.53*	1.12	2.21***	2.75***	1.90***	2.02**	1.34	0.98
	(0.00)	(0.00)	(0.34)	(0.02)	(0.76)	(0.00)	(0.00)	(0.00)	(0.01)	(0.09)	(0.89)

Technicians and intermediate professionals	1.75**	1.15	2.16	3.79***	2.61**	1.63**	2.07**	1.74***	2.25**	1.31	0.95
	(0.00)	(0.36)	(0.06)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.11)	(0.72)
Professionals – arts and social sciences	2.29***	2.15***	2.51*	3.62**	1.70	3.15***	3.31***	2.36***	2.36**	2.02***	1.45*
	(0.00)	(0.00)	(0.03)	(0.00)	(0.13)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
Teaching professionals	2.08***	2.03***	3.23**	2.91**	2.17*	1.79**	1.97**	2.14***	2.15**	1.60**	1.15
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.34)
Science professionals	2.10***	1.77***	2.55*	5.61***	2.18*	2.07***	1.65	2.44***	2.03**	1.62**	1.31
	(0.00)	(0.00)	(0.02)	(0.00)	(0.01)	(0.00)	(0.06)	(0.00)	(0.01)	(0.00)	(0.07)
Managers	1.33	1.43*	2.86*	2.85*	1.84	1.94***	1.71	1.32	1.11	1.07	1.66***
	(0.18)	(0.03)	(0.01)	(0.01)	(0.08)	(0.00)	(0.06)	(0.09)	(0.75)	(0.72)	(0.00)
Legislators, senior officials	2.09***	1.64***	1.88	3.07**	2.06*	2.20***	2.87***	1.86***	2.34***	1.43*	1.57**
	(0.00)	(0.00)	(0.14)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
Mother's occupation (ref: Unskilled workers)											
Machine workers and skilled craftsmen	0.86	1.54*	0.91	0.83	0.98	1.02	0.98	0.43***	0.69	0.96	0.92
	(0.47)	(0.03)	(0.91)	(0.72)	(0.95)	(0.92)	(0.94)	(0.00)	(0.43)	(0.81)	(0.55)
Skilled agricultural and fishery workers	0.92	1.51**	2.94	0.96	1.06	0.97	1.30	0.86	1.34	0.96	1.01
	(0.61)	(0.01)	(0.08)	(0.90)	(0.85)	(0.86)	(0.25)	(0.29)	(0.35)	(0.81)	(0.96)
Sales, service and care work and clerks	1.59**	1.99***	4.42*	1.80	1.55	1.71**	1.96**	1.20	1.70	1.30	1.05
	(0.00)	(0.00)	(0.02)	(0.10)	(0.12)	(0.00)	(0.00)	(0.19)	(0.09)	(0.10)	(0.70)
Sales, finance and business administration	1.45*	2.03***	4.03*	2.25*	0.78	2.33***	2.46***	1.68***	1.52	1.69**	1.10
	(0.05)	(0.00)	(0.03)	(0.04)	(0.53)	(0.00)	(0.00)	(0.00)	(0.23)	(0.00)	(0.54)
Technicians and intermediate professionals	1.17	1.99***	4.75*	2.18*	1.15	1.66**	1.25	1.17	1.72	1.52*	0.92
	(0.34)	(0.00)	(0.01)	(0.03)	(0.64)	(0.01)	(0.37)	(0.26)	(0.08)	(0.01)	(0.50)
Professionals – arts and social sciences	1.94**	2.62***	6.64**	3.26**	2.11*	2.76***	1.63	2.24***	4.10***	1.30	1.79***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.14)	(0.00)	(0.00)	(0.28)	(0.00)
Teaching professionals	1.32	3.48***	7.85***	2.71**	1.58	2.21***	2.00**	1.99***	3.05***	1.55*	1.20
	(0.14)	(0.00)	(0.00)	(0.01)	(0.15)	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)	(0.21)
Science professionals	1.65*	2.73***	5.05*	3.21**	2.50**	2.07***	1.88*	1.94***	2.11*	1.78*	1.17
	(0.02)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.05)	(0.00)	(0.03)	(0.01)	(0.42)
Legislators and senior officials, managers	1.41	2.13***	3.49	1.87	1.29	2.08***	1.55	1.46*	2.11*	1.05	1.20
	(0.10)	(0.00)	(0.07)	(0.14)	(0.50)	(0.00)	(0.15)	(0.02)	(0.03)	(0.84)	(0.27)

Father's education (ref: Elementary school)

High school education	1.26	2.09***	3.19***	1.49	1.67	2.30***	2.18***	2.55***	2.11***	1.94***	1.18
	(0.24)	(0.00)	(0.00)	(0.22)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.20)
Vocational education	1.15	1.31**	1.35	0.91	1.33	1.32**	1.21	1.16	0.81	1.21*	0.82**
	(0.14)	(0.00)	(0.25)	(0.65)	(0.12)	(0.01)	(0.17)	(0.09)	(0.19)	(0.05)	(0.00)
Short/medium higher education	1.59***	1.87***	1.80*	1.90**	1.52*	1.60***	1.69***	1.77***	1.41*	1.78***	1.09
	(0.00)	(0.00)	(0.04)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.30)
Long higher education	1.96***	3.35***	3.34***	2.86***	2.32***	2.12***	2.01***	3.24***	2.21***	2.34***	1.60***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Mother's education (ref: Elementary school)

High school education	2.20***	2.06***	2.14*	2.83***	1.97*	2.01***	1.36	2.75***	4.09***	2.19***	1.34*
	(0.00)	(0.00)	(0.03)	(0.00)	(0.02)	(0.00)	(0.18)	(0.00)	(0.00)	(0.00)	(0.01)
Vocational education	1.52***	1.45***	0.87	1.74**	1.23	1.61***	1.19	1.37***	1.75**	1.42***	0.90
	(0.00)	(0.00)	(0.57)	(0.01)	(0.24)	(0.00)	(0.15)	(0.00)	(0.00)	(0.00)	(0.12)
Short/medium higher education	2.31***	2.08***	1.73*	1.99**	2.21***	1.82***	1.54**	2.56***	3.79***	1.86***	1.22*
	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
Long higher education	2.84***	3.34***	3.39***	2.85***	3.99***	2.29***	1.27	4.91***	5.94***	1.91***	2.55***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.35)	(0.00)	(0.00)	(0.00)	(0.00)

N	54734
pseudo R-sq	0.111
AIC	98041.68
BIC	102737.38

Categories for missing observations included

* p<0.05, ** p<0.01, *** p<0.001

Table 5: Chosen field of study among students with comparable high school GPA's from different social groups

Field of study *(%)*	Social Sciences	Humanistic Studies	Natural or Technical Sciences	Health Sciences	Business Studies	Total
GPA from high school >9						
-Students with academic parents [definition](N=1412)	20	27	22	22	10	~100
-Students with working class parents [definition](N=975)	17	23	23	12	25	~100
GPA from high school <8						
-Students with academic parents [definition](N=365)	27	19	23	3	29	~100
-Students with working class parents [definition](N=641)	25	11	21	2	41	~100

Note: Enrolled 24 year-olds at universities in 2008. Own calculations using register data from Statistics Denmark.