UiT The Arctic University of Norway

School of Business and Economics

A chip off the old block or not?

An analysis of parents' influence on their children's choice of educational field

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Master's thesis in Economics – May 2020

Acknowledgement

Two years of studies at the School of Business and Economics at UIT The Arctic University of Norway have come to an end. I feel very grateful for all the knowledge these years have given me.

First, I would like to thank my supervisor, Mikko Moilanen, for the excellent guidance, discussions, and encouragement throughout this process.

Further, I would like to thank all the great people I have come to know during the master's program. To my office mates, thank you for all the needed coffee breaks and conversations.

My family and friends deserve big thanks for all the support and engagement throughout all my years of study. And Chris Rudi, thank you for all your support and patience. Now I am finally done studying.

Tromsø, May 2020
Sunniva Stoltz Nordli

Abstract

The intergenerational mobility in education length is well-documented. However, the number of people having a master's degree in Norway has increased in the past years. An innovative study is instead to investigate the mobility for the educational fields between generations. This thesis is investigating the parents' influence on their children's choice of educational fields for higher education. The hypotheses state that increased parental incomes increase the probability of children choosing a similar education as the parents, that the children are more influenced by the parent having the same gender, and that the influence of choosing similar education, self-recruitment, is stronger for prestigious educations. The thesis uses Norwegian register data from Statistics Norway, and the analysis is done by using the multinomial logistic regression, which is directly used through the analytical tool, microdata.no. The average marginal effects of children choosing a similar education as the parents, by changes of either hourly wage or hour spent at work, are interpreting the results. By a wage increase, the results show an increased probability of children choosing a similar education as the parents, and these probability increases are higher for educations of high prestige. However, the results do not confirm the same-gender hypothesis.

Keywords: *Intergenerational mobility, educational influence, educational choice, inequality, higher education*

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1 Introduction

Intergenerational mobility explains the relation between children's and parent's position on the social scale. Income, education, and occupation are factors that describe one's socioeconomic status. Thus, individuals with higher incomes, higher educations, and better jobs are seen as having a higher socioeconomic status. To a greater extent, children who live in societies with a low degree of intergenerational mobility would get an income or achieve education close to their parents (Solon, 1999). Essential approaches covering the research about intergenerational mobility are the investigations on whether family background affects an individual's educational attainment. The results show a positive correlation between parental background and their children's educational achievements. The parental influence is weaker for the Nordic countries than in other countries (Causa & Johansson, 2011; Hertz et al., 2007).

Becker and Tomes (1979) have developed a model that explains intergenerational mobility. One of the factors that determine how much children's income is related to the parents' income is human capital investments. Such investments might develop and support the children's skills and efficiency, which are factors that can affect the choice of whether taking take a higher education or not. There is a correlation between education and income, where higher education often leads to higher incomes. The parents' investments in children's human capital are dependent on their income, where higher incomes give possibilities for higher human capital investments. Hence, one can see that children having parents with higher incomes have a greater possibility of achieving a higher education (Black & Devereux, 2011; Corak, 2013).

One motivation for researching intergenerational mobility is the desirable situation where all individuals have the same opportunities, independent of family background. In societies where the intergenerational mobility is low, children having parents with higher education and higher incomes will tend to achieve higher incomes and educations. Similarly, for families having lower education and incomes, the children would more often also get lower incomes and education (Solon, 1999). Such a situation would lead to inequalities between the top and the bottom of the scale, which could lead to an even higher gap for future generations if the level of mobility is unchanged.

Several studies have investigated the relationship between parents' and children's educational lengths (Black, Devereux, & Salvanes, 2005; Hertz et al., 2007). However, the number of people taking a master's degree has increased the lasts decades. Statistics from Statistics Norway show that the share of people over 16 years old that, in 2019, have a higher education is 10 % compared to 7.3% in 2013 (SSB, 2019). Therefore, it might be innovative to research the mobility between generations by focusing on different educational fields in higher education. The different fields of master's educations lead to different occupation possibilities, which again lead to a spread in the earned incomes between individuals. Some education fields often give higher incomes and are therefore more attractive choices between the students. There have been shown that parents, to some degree, influence their children to attain a certain education length. According to a framework presented by Schneebaum, Rumplmaier, and Altzinger (2014) children's educational attainment are more affected by the educational attainment for the parent having the same gender. This master's thesis will investigate whether the children's choice of educational field is affected by their parents and whether the same-gender hypothesis applies to educational fields.

Several sociologists have already shown an interest in this field. Dryler (1998) investigated if Swedish children are influenced by their parents' educational field and occupational sector when they choose their educational path at the upper secondary school. Helland (2006) is investigating whether the parents' educational field influence master's degree students' choice of the educational field. One of the hypotheses is whether the influence is greater for elite educations. That is if the self-recruitment is stronger for families with elite educations. However, this thesis will investigate the parental influence by using economics theory, with the intergenerational mobility theory as the basis.

According to Becker and Tomes (1979) and Black and Devereux (2011), the intergenerational mobility model explains that parental income has an impact on the children's incomes and educational attainment. A higher parental income increases the investments in children's human capital, which could affect the children's educational choices. The focus is on the children's choice of master's degree educations. However, different educations lead to different incomes. Inspired by Helland (2006) and the classification of elite educations he uses, the educations in this thesis are separated into three prestige levels, from high prestige to low prestige. This categorization of prestige levels is to investigate whether the parents' prestige levels are influencing the children's educational choice. The educations that classify

as high prestige are business & administration, law, some engineer studies, and medicine. This classification follows the elite educations by Helland (2006).

The research question for this thesis is separated into three hypotheses. The main focus is to investigate whether parents can influence children in choosing a similar education for higher education. However, the theory about intergenerational mobility shows that children's income and educational attainment are, to some extent, influenced by the parent's educational background and income. Higher incomes will probably lead to greater influence, which is one of the hypotheses that will be tested. The second hypothesis is whether daughters are more influenced by mothers and sons more by fathers. The third hypothesis is whether children with high prestige educations are more likely to choose a similar education as parents. Lower mobility for high prestige can lead to increased inequality in educations. The research question and the hypotheses to be tested are as follows:

Do parents influence their children's choice of educational fields for master's degree levels?

- H1: An increase in parental income makes it more likely that the children choose a similar education at the parent
- H2: The children are more influenced by the parent of the same gender.
- H3: Self-recruitment is higher for educations of high prestige

Norwegian register data from Statistics Norway is used to address the hypotheses. These register data are available through the newly launched analytics tool, microdata.no. The topic of interest is whether children choose a similar education as the mothers or the fathers, or whether they chose a different education. Hence, the multinomial logistic model is an appropriate model to use.

The next section will present a theoretical model that explains intergenerational mobility and a few empirical literature reviews. The third section will describe the data set and the chosen variables. The fourth section will, in detail, describe the analytical model that is used for estimation, the multinomial logistic model. The fifth section will present the estimated results. The thesis ends with a part that discusses and concludes around the results.

2 Theory

2.1 Intergenerational mobility

Intergenerational mobility, in general, is describing the relation between parents' and their children's position on the socioeconomic scale, which include factors like income and education (Becker & Tomes, 1979; Causa & Johansson, 2011; Solon, 1999). In societies having a lower degree of intergenerational income mobility, one would have a higher prediction about the children's incomes by already knowing the parents' position on the income distribution (Corak, 2013; Solon, 1999). This specific situation would, to a higher degree, limit the children's pay-offs compared to societies having a higher level of intergenerational mobility, where the socioeconomic connection between children and parents is less decisive (Narayan et al., 2018). This illustration also applies to education. The educational mobility is low if the educational persistence between parents and children are close.

Becker and Tomes (1979) have developed a theoretical model that explains what is meant by intergenerational mobility. The interest in studying intergenerational mobility, among economists, started with this model. The model shows how children's wealth or outcome is dependent both on their parents' wealth, and their parents' investments in their human capital. Investments in human capital are investments that, through improve individual's resources, increase future income, like education (Becker, 1962). To describe intergenerational mobility, Becker and Tomes (1979), and Guner (2015) presenting a simplified model, show the parents' utility as a function dependent on their own consumption, C_t, and their children's wealth, I_{t+1}, written as:

$$U_t = U_t(C_t, I_{t+1}) \tag{2.1}$$

The utility is maximized subject to

$$I_t = C_t + X_{t+1} + h_{t+1}$$

$$I_{t+1} = w_{t+1}H(h_{t+1}, G_{t+1}, e_{t+1}) + (1 + r)X_{t+1} + u_{t+1} \tag{2.2}$$

Where the parents' budget constraint shows that their income is spent on their own consumption, on any financial transmissions to the children, X_{t+1}, or for making investments in the children's human capital, h_{t+1}. Children's income is determined by the amount of human capital they have, which is determined by the investments the parents do in their human capital, h_{t+1}, the endowments they inherit from their parents regardless of the human capital investments, e_{t+1}, along with government's spending for investment in human capital, G_{t+1}. Also, the financial transmission, and u_{t+1}, which is capital return due to advantage or success in the income market for the children, determine the children's income. w_{t+1} is the notation for human capital return (Becker & Tomes, 1979; Guner, 2015).

Equation 2.2 shows how the children's income is related to the income of their parents, through the parents' investments in their human capital, but also by the endowments that are inherited. Becker and Tomes (1979) are assuming the endowment only to be dependent on the parents' endowments and endowments in the society. Endowments are characteristics received from parents or other members of the family, both in genetics, like abilities and race, but also from belonging to a specific family, like skills and learning goals. The endowments are assumed to be correlated positively with endowments of parents. The human capital production function H(·) are partly dependent on the endowments, which means that the abilities transmitted from parents to children are a part of the productive in children's human capital development. Moreover, a higher parental income gives a higher amount to be used to human capital investments, and a higher portion invested in the children's human capital will make a positive difference in their income. This relation illustrates the relationship between the incomes of parents and children and is the fundamental of intergenerational mobility (Becker & Tomes, 1979; Guner, 2015).

The degree of intergenerational mobility depends on all the mentioned relations. The children's earnings depend on, besides financial transfers from parents and market luck, the return to human capital invested in them. This return is higher if the investments in children's human capital are also higher, and if the transmission of endowments from parents' generation to children are more robust. Parents' human capital investments are partly decided by parental income. Therefore, the amount invested in human capital is determined by how much their parents want to invest. Parents having higher incomes also have the opportunity to invest more in their children's human capital, which, in turn, will affect the children's earnings positively (Becker & Tomes, 1979).

Black and Devereux (2011) state that parental education return and family income are factors that affect their children's choice of education. The fact that parents being higher educated tend to have children also choosing higher educations is a direct effect of having higher educated parents, like the relation between parents' and children's income. The indirect effect applies to the transmitted endowments or abilities from parents to children. As the theoretical model on intergenerational mobility by Becker and Tomes (1979) stated, are the children's abilities related to their parents' abilities. Abilities have a role in the return of human capital. Higher abilities lead to a higher return, and a higher return to human capital increases the possibility of choosing higher education (Black & Devereux, 2011).

Family income is also mentioned by Black and Devereux (2011) as a factor that influences the educational choice. Parents having higher incomes due to higher education may affect the children's educational attainment. This aspect is highly related to one of the hypotheses stated in this thesis, that children with parents having higher incomes have a higher tendency of choosing the same education as their parents and that this tendency is higher for educations of high prestige. Therefore, the perspective on whether children's educational choice is affected by their parents' income is especially important for my thesis. Children from higher-income families have some advantages. As the theoretical model showed, one advantage is that the parents can invest more in human capital. These investments may lead to situations where the children learn needed skills in a more unchallenging way, which will be advantageous due to increased efficiency and possibilities. These are factors that may increase the educational attainment for the children (Corak, 2013). Also, parents may have more incentive to make investments in their children's human capital if these investments give a greater return, like higher education, who often gives higher incomes and higher possibilities in the labor market (Solon, 2004).

The model by Becker and Tomes (1979) does not separate the children's and parents' gender, which is an essential approach in my thesis. Schneebaum et al. (2014) summarize two theoretical frameworks that explain why parents and children make different educational choices dependent on gender. The first framework includes the household model, based on the theory by Becker and Tomes (1979), whom Gang and Zimmermann (2000) extend to separate the mothers' and fathers' parts of the transmission of human capital to the children. The model by Becker and Tomes (1979) shows that the parents' investments in children's

human capital are affecting the educational attainment for the children and, after that, their income. Gang and Zimmermann (2000) assume that the father has full-time work while the mother spends her time both at work and at home. Hence, the father's income is only affecting the children's education through human capital investments related to earned incomes. Mothers, who spend more time with children's education at home, will influence their children's education through income and by educating the children by spending more time with them. An increase in the mother's educational attainment will decrease the time she uses on the children at home. Hence, her alternative costs of home education will increase. The predictions state that the total effect of father's education, therefore, is higher than the mothers. The father's education is affecting the children's educational achievements more positively compared to the mother's education due to the increased alternative costs of spending less time home (Gang & Zimmermann, 2000; Schneebaum et al., 2014)

Even though the household production model is separating how the parents' gender affects children's educational attainment, it is, however, missing the aspect of whether the children are females or males. The second framework presented by Schneebaum et al. (2014) includes the aspects of children's gender, linked to educational attainments. The framework focuses on parents as role models and family socialization. The background for this theory is the transferred qualities and manners between generations, which can be related to what Becker and Tomes (1979) referred to as inherited endowments. These transferred characteristics could be gender-typical, leading to manners being transmitted between children and parents having the same gender. How the parents appreciate educational attainment is one of these transmitted characteristics, which lead to higher-educated fathers having a greater educational influence on sons than daughters. Similarly, higher-educated mothers will influence their daughters more than their sons according to educational attainment (Schneebaum et al., 2014).

A summarization of the two frameworks explaining why parents' and children's educational attainments between generations may depend on genders, shows that the model concerning household production claims that both daughters and sons are more educational influenced by their father. The role-model theory states, however, that fathers influence their sons more, and mothers influence their daughters more (Schneebaum et al., 2014). It is important to clarify that these predictions apply for the educational length while my thesis is focusing on the different educational fields in higher education. However, one can imagine these theoretical

predictions to apply at least as well to the field of education as to the length of education. The interest of specific educational fields can just as well be transferred and inherited between generations as the length of education can. Mothers and fathers might also influence their children differently toward specific educational fields. The parent who spends more time with the children can influence them in one way, while the parent earning higher incomes might influence in another way, and then lead them toward certain fields. It is interesting to see if these theoretical predictions also apply to the influence of educational fields, which will be addressed in this thesis.

2.2 Empirical literature review

Several studies have already been done concerning intergenerational mobility in education, with the main focus being whether education length transmits from parents to children (Black et al., 2005; Hertz et al., 2007). Hertz et al. (2007) investigated in their paper how educational attainment transferred between generations in a fifty-year perspective, 42 countries included. They used the regression coefficient from the regression of children's education against their parents, but also the correlation coefficient between the generations to measure educational persistence. The data was separated into five-year cohorts for comparison over the fifty years measured. The results showed that the Nordic countries had the lowest average correlation between parental and children's education with 0.34. Norway had a correlation coefficient of 0.35. In comparison, the other countries belonging to western Europe and the USA and the Eastern Bloc measured a correlation of 0.41.

Black et al. (2005) also investigated the transmission of educational length between generations. Unlike Hertz et al. (2007), they focused on the relation between the different gender-pairs of parents and children. Their research is focusing on causal effects between parents' and children's education length connected with the compulsory school reform in Norway, who increased the years of mandatory school from seven to nine years. They ran an OLS on children's years of education against the parents' years of education, but also a Two Stage Least Squares (2SLS) with the first stage being the relationship between parents' years of schooling against if they were affected by the reform or not with *reform* being the instrumental variable. The results showed that an extra year of parental education increased the years of education for the children. This result was independent of whether the mother was measured against her daughter or son. The same applied to the father against his daughter or son. A one-year increase in parents' education showed an increase in children's education

by 0.2 to 0.25 years. The 2SLS estimates showed only one significant causal connection between mother's education and son's education, and none between the other parent-child pairs.

Since the intergenerational mobility in education length is a well-researched area, it is a natural extension to investigate the specific education fields in higher education, and if the fields are affecting children's choice of the educational field instead. Since this educational influence is the focus of my thesis, it is natural to get an overview of previous papers investigating this field. Sociologists have already shown interest in this, but few papers are investigating this by the use of economics theory. This lack of papers shows the importance and relevance to such an investigation this thesis will address.

One study concerning the choice of education fields between gender is a study done by the sociologist Dryler (1998). It is a study investigating students' choice of educational programs at the upper secondary school in Sweden. The focus is to investigate the parents' influence on their children's determination of educational path. More precisely, if the parents' field of education or their occupational sector affects their children to make educational choices related to their parents' choices. The paper is both investigating if the children are influenced to choose an educational field in the same area as their parents' educational- and occupational field, but also if the parental influence is present when it comes to gender-atypical programs as well. To clarify what is defining gender-atypical programs and gender-typical programs, Dryler (1998) collected the applicants' first choice for every fourth comprehensive school for those who graduated between 1988-1992. For these pupils, the engineering program had 79% of applicants being boys and 21% being girls. Humanities and social science had, respectively, 88% and 71% of applicants being girls. Based on this, engineering was classified as a field for boys typically, and humanities and social science, a typical educational field for girls (Dryler, 1998).

To explain the educational choices based on gender-typical socialization, Dryler (1998) uses two of the most dominant sociological theories to describe such socialization, the social learning theory, and the cognitive-development theory. According to Dryler (1998), the social learning theory says that children choose to follow parents' gender-specified manners because they are being encouraged and supported to do that. The cognitive-development theory says that the children decide themselves which parent to follow, and mostly, that would be the

parent of the same gender. However, the most prominent parent can influence children of the opposite gender to follow them instead (Dryler, 1998). These sociological theories can be related to the theory by Becker and Tomes (1979). Which parent the child chooses to follow can both be the parent who influences the child by spending more time at home or the parent who has higher earnings. Also, parents' encouragement can be related to the transmitted endowments, that, for instance, could be goals or expectations parents have to their children.

For academic programs, Dryler (1998) used four dependent variables, being the two gender-typical educational fields, engineering for boys, and humanities/social science for girls, and the two gender-atypical fields, engineering for girls and humanities/social science for boys. The independent variables were the parents' educational fields and occupational sectors. The results showed that, with a few exceptions, a positive relationship between children's educational choice and their parents' educational and occupational sector, no matter if the educational fields were gender-typical or not. One exception worth mention is that mother having a technical education or occupation did not seem to affect the son's choice concerning engineering education at the same level as the father. Dryler (1998) also investigated if the parents' effect were more substantial between mother and daughters, and fathers and sons. The results showed that boys are more affected by their father's educational field or occupational sector than by their mothers. This result was true both for engineering and humanities/social science. However, daughters showed no pattern in the chosen fields dependent on parents' gender. The results showed a weak same-gender effect since only sons were affected by the parents' gender, which suggests that the cognitive-developmental theory is not satisfactory enough to explain why sons and daughters choose as they do, compared to parents of the same gender. However, the parents' encouragement, according to the social learning theory, seems to be more present (Dryler, 1998).

Helland (2006) investigates in his paper if children's choice of educational fields is affected by their parents' social background, using data from Norway containing master's degree students who graduated between 1985 and 1996. He promotes hypotheses stating that the self-recruitment is higher for the elite educations than the others and that children having parents with higher incomes tend to choose the elite educations. Educations like law, engineering, and medicine are classified as elite educations. Helland (2006) uses sociological theory by Boudon (1974) to explain the differences in educational choices. He is presenting three mechanisms to explain these educational differences. The first one concerns how different

social groups value different educations. Individuals that belong to families in one class- or status group may value educational fields differently. For instance, children having parents being doctors or lawyers may value educations like medicine and law higher than other studies. The second mechanism is that individuals' accomplishments may differ between the social groups because certain social groups or educations have some cultural similarities. It is built on the assumption that children have a higher knowledge of their parents' field of education than other fields. The last mechanism describes that individuals want to choose an education where their social scale position is at least as high as their parents' position. This is highly related to situations where children choose elite educations as a result of that their parents also have an elite education (Helland, 2006).

The dependent variables are the different education fields the children could choose between. Based on this, the multinomial logistic regression was the preferred model to use. One of the independent variables is the parents' educations, where the parent who has the highest education is used. The father's education is used if both parents have an education at the same level. Helland (2006) justifies this by assuming that the father's education is having a higher impact on the children's choice of education, due to greater importance on the belonging to a specific status group. This assumption is justified by the number of fathers being far higher than mothers in the used dataset. To the cases where the mother has the highest education, a dummy variable is created to take into account that specific situation. Other independent variables included are the parents' income and social class. Here, fathers' occupation is used as social background, and for incomes, the one between father and mother having the highest income is used.

To get some interpretable results, Helland (2006) estimated the probabilities of choosing specific educations dependent on the parents' educations. These probabilities were restricted to only apply for male students who completed their education in 1991, lived in central municipalities, and having parents with incomes equal to the median. The highest probabilities for each possible chosen education belonged to children choosing the same education as their parents (male students compared with father's education mostly). Moreover, children choosing similar education as their parents, where parents were elite educated, had the highest tendency of choosing the same educational path. The probability of children (males) with engineering parents, also chose an engineering education was estimated to 0.6, while the probabilities for law education and business administration were estimated

to, respectively, 0.4 and 0.22. As a comparison, social science, and humanities and theology had estimated probabilities of 0.15 and 0.14. Helland (2006) relates some of the estimates to the third mechanism that children choose an education only to achieve at least the same position as their parents. However, this mechanism does not explain why children with engineering parents tend to choose an engineering education with a probability as high as 0.6. If the only purpose was to achieve the same social position, the children could have chosen educations in medicine and law since they are also classified as elite educations. According to Helland (2006), it is then reasonable to also relate the results to the mechanisms according to how different social classes value education fields differently and to cultural similarities making it more reasonable to choose education similar to the parents.

Both Helland (2006) and Dryler (1998) are investigating interesting aspects of educational field decisions, where the main focus in both articles has concerned the impact of children's educational choices based on their parents' education. However, they have both omitted aspects of interest. Helland (2006) limited his variables not to include both of the parents. The education variable and the income variable contained that parent having the highest education level or the highest incomes, which gives restricted information about how both the mother and father are affecting their children's choice of education, and also how mother and father may affect daughters and sons differently. Dryler (1998) did separate the education variable into both mother's education and father's education, and these results did say something about the impact on daughters and sons from the mothers and fathers, though only for two educational paths. One aspect missing in both the papers is how the parental income, both mother's and father's, separately affects the parental influence on their daughters' and sons' educational choices. This aspect is relevant for investigating educational influences by parents, and the lack of papers makes it an even more important investigation. In this thesis, I want to contribute to highlight the importance of doing more research concerning the children's choice of educational path, by the influence of the income of both parents. By including incomes, one could show if mothers or fathers get more influential dependent on higher incomes, and in which direction this influence goes. Unlike Dryler (1998) and Helland (2006), who used sociological theory the explain the different educational choices, this thesis will be based on the intergenerational mobility model by Becker and Tomes (1979) to investigate this based on an economics point of view.

3 Data

This thesis' analysis uses Norwegian register data from Statistics Norway (SSB). These register data are available through microdata.no, an analytics tool launched in 2018. Microdata.no is a service established between SSB and Norwegian Centre for Research Data (NSD) to make the use of register data in research less complicated. All the different variables contained in the register data are included in the analytics tool, which makes it possible to analyze register data immediately through microdata.no. By May 2020, microdata.no has about 200 different variables, including information about education, income, employment, demographics, and other population characteristics like gender, family size, and immigration. By the use of microdata.no, it is possible to use data that is not anonymized. However, confidentiality is secured by several measures that only give anonymous outputs, which makes it impossible to identify individuals. For instance, it is not possible to make populations with fewer than 1000 individuals for further estimations. Noise added to descriptive tables (+/- 5) is another measure to secure confidentiality. Hence, summations of table cells will deviate from the population size. One limitation by using microdata.no for analyses is that the choice of statistical models is restricted by the models available by microdata.no. Also, it is not possible to use other statistical programs on the data, or connect own data to microdata.no (Ballo, 2019; NSD & SSB, 2018).

3.1 Dataset and variables

This thesis aims to investigate whether children's choice of educational field is affected by their parents´ education for master's degree educations. The children included are those born from 1980 to 1992, the millennial generation. Children excluded from the dataset are those who not lived in Norway or had an unspecified address at the age of 16. A further restriction is that the children must have at least one parent with a completed master's degree before the child was 16 years old. For those situations where only one parent has completed a master's degree, the other parent must have completed a bachelor's degree. The children with parents having a completed bachelor's degree or lower at the children's age of 16 are excluded from the dataset. Limiting the other parent to at least having a bachelor's degree is only to include families where education is essential for the family. However, the children's educational choices being analyzed are for master's degree levels only. Also, postgraduate educations are excluded. These restrictions give a total of 18635 children.

3.1.1 Education by prestige levels

The educations in microdata.no are classified by The Norwegian Standard Classification of Education (NUS2000), which is the standard education classification used by Statistics Norway. NUS2000 is a code system of 6 digits, with each digit varying from 0 to 9, which classifies all levels and fields of education in Norway. The first digit classifies the educational level, where, for instance, 1 defines primary education, 2 lower secondary education, etc. 7 defines master's levels, or first stage of tertiary education, graduate level. The second digit classifies educations in a broad aspect. For the tertiary educations, the educations are separated in nine different fields: general subjects (70), humanities and arts (71), teacher training and pedagogy (72), social science and law (73), business and administration (74), natural science (75), health, welfare, and sports (76), primary industries (77), transports, safety and security (78) and unspecified fields (79). The third digit is narrowing each field even further. For instance, the category containing health education (76) is separated into nursing, social services, medicine, dental health, therapy, pharmacy, veterinary medicine, sport and physical education, and others (SSB, 2020). The educations chosen in this thesis comprises those categorized by the third digit by NUS2000 (see appendix for the complete third digit categorization by NUS2000).

For the analysis in this thesis, the educations are separated into three levels of prestige, from high prestige to low prestige. The different prestige levels are defined by considering which educations give the highest incomes, but also which educations normally are the most popular studies among students, by having the most applicants or having high admission requirements. The education fields for each prestige level are separated into educations belonging to Social sciences and law, and Business & administration (73 and 74), Natural sciences (75), and Health (76). The educations classified having the highest prestige are business and administration and law, natural science/engineering (in the fields of physics and chemistry, geology, and electronic and mechanical), and medicine. These educations follow to what Helland (2006) refers to as elite educations in his research concerning educational choices. The middle prestige educations are psychology and economics, engineering (in the fields of information and computer technology, and building and construction), and odontology and pharmacy. The remaining educations are categorized as low prestige. See table 1 for a detailed categorization. Educations classified by the same letter are seen as

similar educations. Hence, law and business & administration are classified as the same education.

Table 1: *Categorization of prestige levels. The 2nd digit classification (NUS2000) in parenthesis.*

Prestige levels	**Educations**
High prestige	a. Law, and Business & administration (73 and 74) b. Natural science/engineering - physics and chemistry, geology, and electronic and mechanical (75) c. Medicine (76)
Middle prestige	d. Psychology and Economics (73 and 74) e. Natural Science/Engineering- information and computer technology, and building and construction (75) f. Odontology and Pharmacy (76)
Low prestige	g. Social science, law and Business & administration, remaining (73 and 74) h. Natural science, remaining (75) i. Health, remaining (76) j. The remaining uncategorized master's educations

3.1.2 Variables

The purpose of this thesis is to investigate whether parents' education influences their children's choice of education. The dependent variable comprises three choice alternatives, whether if the children choose a similar education as one of the parents or if they choose a different education than both parents. These outcomes depend on different explanatory

variables, which are mothers' and fathers' hourly wages and their weekly hours spent at work. See the table 2 for further descriptions.

Table 2: Descriptions of the variables

Variables	Description
Dependent variable	
The child's choice of education	0 if the child chose an education that is different from both mother's and father's education 1 if the child chose an education equal to the father's education. 2 if the child chose an education equal to the mother's education.
Explanatory variables	
Hourly wage, fathers	The fathers' average income from 2001 to 2012 on the average working hours from 2001 to 2012
Hourly wage, mothers	The mothers' average income from 2001 to 2012 on the average working hours from 2001 to 2012
Weekly working hours, fathers	The average working hours per week from 2001 to 2012 for fathers
Weekly working hours, mothers	The average working hours per week from 2001 to 2012 for mothers
Centrality	Centrality index for each municipality varying from 0 to 1000. 1000 is the most central municipality. The index is developed by Statistics Norway (SSB, 2017).
Proportion higher educated in each municipality	The share of individuals that have completed a higher education for each municipality in 2012

According to Becker and Tomes (1979) and Black and Devereux (2011), investments in children's human capital are positively affecting the children's educational attainment. The amount of these investments depends on parents' income. The parent's incomes could have been appropriate explanatory variables. However, the incomes are often correlated with hours of work. Gang and Zimmermann (2000) assume that mothers often spend more time home with their children instead of working and that fathers work full time. Since earnings probably

are correlated with working hours, mothers would have a lower income compared to fathers. According to the theory, mothers would probably invest less in children's human capital, which would directly give smaller educational influence than fathers. By this reasoning, the parents' total income will not be an explanatory variable. Hourly wages are chosen as the explanatory variable describing the earnings, by separating the total income and working hours. A mother who works part-time might still have a high hourly wage even though the yearly income has decreased. Using the hourly wage makes it possible to investigate if higher parental earnings are an important factor for children's choice of education. A higher wage gives higher incomes depending on hours working. Furthermore, the hours the mothers and fathers are spending *at work* are also an explanatory variable. Using these variables makes it possible to separate the effects of hourly wages and hours of work. One of the hypothesis states that children are more affected by the parents having the same gender. A dummy variable for the children's gender is interacted with the *hourly wage* variable and the variable for *home hours* for mothers and fathers, separately, to test this hypothesis.

Becker and Tomes (1979) are assuming the inherited endowment are also dependent on the endowments in the society, and not only those transmitted from parents. I control for this by including an index variable of each municipality's centrality and a variable containing the share of higher educated in each municipality. Children who live in more central towns or districts, and children who live in municipalities having a higher share of higher educated might have a higher possibility of getting information about educations from other than only their parents.

3.2 Descriptive statistics

The main dataset includes 18635 children. Descriptive statistics on the variables are presented in table 3.

Table 3: Descriptive statistics on the variables

Statistic	Mean	St. Dev	Min	Max
Gender (women = 0, men = 1)	0.47	0.49	0	1
Weekly hours at work (fathers)	34.92	4.25	18.75	40
Weekly hours at work (mothers)	31.46	5.45	15.96	38.71
Hourly wage (fathers)	382.7	140.02	176.96	873.18
Hourly wage (mothers)	274.95	88.08	160.12	645.98
Centrality	862.37	115.17	544	1000
Proportion higher educated	0.37	0.10	0.18	0.51
High prestige				
Gender (women = 0, men = 1)	0.52	0.50	0	1
Weekly hours at work (fathers)	34.8	4.37	18.75	40
Weekly hours at work (mothers)	31.39	5.49	15.96	38.71
Hourly wage (fathers)	401.39	145.82	177.22	873.18
Hourly wage (mothers)	280.13	94.28	160.13	645.98
Centrality	866.87	113.42	544	1000
Proportion higher educated	0.37	0.10	0.18	0.51
Middle prestige				
Gender (women = 0, men = 1)	0.495	0.50	0	1
Weekly hours at work (fathers)	35.22	4.03	20.42	40
Weekly hours at work (mothers)	31.36	5.56	15.96	38.5
Hourly wage (fathers)	379.81	130.17	178.92	828.91
Hourly wage (mothers)	274.82	87.12	160.98	645.98
Centrality	861.1	114.93	552	1000
Proportion higher educated	0.36	0.10	0.18	0.51
Low prestige				
Gender (women = 0, men = 1)	0.41	0.49	0	1
Weekly hours at work (fathers)	34.93	4.18	18.75	40
Weekly hours at work (mothers)	31.62	5.31	16.76	38.54
Hourly wage (fathers)	359.78	132.19	176.96	852.26
Hourly wage (mothers)	267.58	76.49	163.34	569.31
Centrality	856.90	117.31	544	1000
Proportion higher educated	0.36	0.10	0.18	0.51

The descriptive statistics show that more women have an education of lower prestige. The parent's hourly wage decreases when the prestige level gets lower, both for fathers and mothers. Also, the individuals with a higher prestige education, live in more central municipalities.

Table 4 and 5 show the numbers and proportion of children having education for each of the prestige levels, and how the children's choice of alternatives by the dependent variable is distributed. The tables show that most of the children have an education of high prestige and have an education different from their parents.

Table 4: Distribution of the children's prestige levels

Children's education	**Individuals**	**Proportion**
High prestige	8895	47.73 %
Middle prestige	3246	17.42 %
Low prestige	6504	34.9 %

Table 5: Distribution of children's choice by the dependent variable

Children's choice	**Individuals**	**Proportion**
Different education	13634	73.16 %
Same education as father	3465	18.59 %
Same education as mother	1545	8.29 %

4 Method

The logit and probit model can be used to examine the choice behavior when an individual must choose between two alternatives, a binary dependent choice variable. The probit model assumes that the probability of choosing one of the two alternatives follows the cumulative distribution function of a normal distribution. For the logit model, the probability follows the cumulative distribution function for a logistic distribution (Hill, Griffiths, & Lim, 2012; Kennedy, 2008). However, when the individuals are facing situations where they have to choose between more than two alternatives simultaneously, the multinomial logit model can be used, which is an extension of the logit model. Since the estimations for this thesis must be done in microdata.no, the multinomial logit is the only alternative available for multiple-choice alternatives. The multinomial model is used to model nominal outcomes for each choice and relate it to certain individual characteristics as explanatory variables (Hill et al., 2012; Studenmund & Cassidy, 1992). In my analysis, the dependent variable contains three different alternatives, making the multinomial logistic regression a valid model to use.

4.1 Multinomial logistic regression

Let K define the number of alternative categories to choose between, j = 0, 1, …, K. In a multinomial model, a reference category, also called the base category (b), is chosen as a comparison towards the remaining K-1 categories (Studenmund & Cassidy, 1992).

y_i is the outcome if individual *i* choose alternative *j,* i = 1,…,n. The multinomial logit model, with b as the base category, is defined as:

$$ln\left(\frac{Pr(y_i=j \mid \mathrm{x})}{Pr(y_i=b \mid \mathrm{x})}\right) = \beta_{0j} + \beta_{1j}x_i + \cdots + \beta_{pj}x_i = \mathbf{x'}_{\mathrm{i}}\boldsymbol{\beta}_{\mathrm{j}}, \quad j \neq \mathrm{b}. \tag{4.1}$$

Which is the log-odds that the *j*th alternative is chosen compared to that the base category (b) is chosen. The model is further assuming p explanatory variables, x_i. The p-dimensional vector, β_j, contains the parameters that refer to the effects on x_i for choosing the *j*th alternative. The multinomial logit system will contain K-1 logit equations for each alternative not being the base category. $\Pr(y_i = j \mid \mathrm{x})$ is the probability that individual *i* choose alternative *j*. These probabilities are defined as:

$$P(y_i = j|\mathrm{x}) = \frac{exp(\beta_{0j}+\beta_{1j}x_i+\ldots+\beta_{pj}x_i)}{\sum_{k=0}^{K} exp(\beta_{0k}+\beta_{1k}x_i+\cdots+\beta_{pk}x_i)}$$
$$= \frac{exp(\mathbf{x'}_{\mathrm{i}}\boldsymbol{\beta}_{\mathrm{j}})}{\sum_{k=0}^{K} exp(\mathbf{x'}_{\mathrm{i}}\boldsymbol{\beta}_{\mathrm{k}})} \quad (4.2)$$

From eq (4.2), the log-odds when comparing an outcome with itself, is $\ln(\mathrm{P}(y_i = b \mid \mathrm{x})/\mathrm{P}(y_i = b \mid \mathrm{x})) = 0$, which gives $\beta_{0b} = \beta_{1b} = \ldots = \beta_{pb} = 0$. The probability for the base category is therefore given by:

$$P_{i0} = P(y_i = b|\mathrm{x})$$
$$= \frac{exp(0+\cdots+0x_i)}{exp(0+\cdots+0x_i)+\sum_{k=1}^{K} exp(\mathbf{x'}_{\mathrm{i}}\boldsymbol{\beta}_{\mathrm{k}})}$$
$$= \frac{1}{1+\sum_{k=1}^{K} exp(\mathbf{x'}_{\mathrm{i}}\boldsymbol{\beta}_{\mathrm{k}})} \quad (4.3)$$

Further, the probability of the remaining alternatives is:

$$P(y_i = j|\mathrm{x}) = \frac{exp\left(\mathbf{x'}_{\mathrm{i}}\boldsymbol{\beta}_{\mathrm{j}}\right)}{1+\sum_{k=1}^{K} exp(\mathbf{x'}_{\mathrm{i}}\boldsymbol{\beta}_{\mathrm{k}})} \qquad \mathrm{j} \neq \mathrm{b} \quad (4.4)$$

(Hill et al., 2012; Long & Freese, 2001)

I want to investigate whether the probability of children's choice is affected by a change in the explanatory variables. Therefore, the marginal effects will be calculated for interpretation. The marginal effect shows the change in the probability of choosing one alternative by a change in one of the explanatory variables. The average marginal effect (AME) is the average on the effects estimated across observations. The AME on the probability that an individual chooses alternative *j,* due to an increase in one explanatory variable is written as

$$AME = \frac{1}{n}\sum_{i=1}^{n}\frac{\partial P(y_i = k)}{\partial x_i}$$
$$= \frac{1}{n}\left(p_{ik}\left(\boldsymbol{\beta}_k - \sum_{j=0}^{K} p_{ij}\boldsymbol{\beta}_j\right)\right) \quad (4.5)$$

If AME > 0, an increase in *x* increases the probability of choosing one of the alternatives, making it more likely to choose the alternative. Similarly, if AME < 0, an increase in x decreases the probability of choosing one alternative (Hill et al., 2012; Long & Freese, 2001).

5 Results

The analysis contains four separate multinomial logit regressions. One for each of the three prestige levels and one who is including all educations independent of prestige levels. By separating the regressions into prestige levels, it will be possible to investigate any differences in the influence of choosing a similar education as the parents, depending on the prestige level of the education. The multinomial logit model, equation 4.1, gives the log-odds estimated. The log-odds estimates are presented in the appendix. However, when having interaction variables in a logit/mlogit regression, the interpretation of the log-odds cannot be used. The z-statistics do not establish the statistical significance between the interaction coefficients from the regression (Norton, Wang, & Ai, 2004). Hence, the average marginal effects are used for interpretation.

5.1 Estimation for all educations

The average marginal effects for all educations, independent on prestige levels, are presented in table 6:

Table 6: *Estimated average marginal effects of children's educational choice, all educations*

Explanatory variables	Different education (j=0)	Same education as father (j = 1)	Same education as mother (j = 2)
Father's wage rate (ref. daughter)	-0.00004	0.00103**	-0.00098***
	(0.00054)	(0.00047)	(0.00033)
Father's wage rate x son	-0.00256***	0.00273***	-0.00017
	(0.00057)	(0.00048)	(0.00036)
Mother's wage rate (ref. daughter)	-0.00009	-0.00494***	0.00504***
	(0.00096)	(0.00093)	(0.00037)
Mother's wage rate x son	-0.00026	-0.00409***	0.00435***
	(0.0009)	(0.00085)	(0.00039)
Father's time at work (ref. daughter)	0	0.00041	-0.0004
	(0.00159)	(0.00139)	(0.00094)
Father's time at work x son	-0.00145	0.00115	0.00029
	(0.00161)	(0.00137)	(0.00102)
Mother's time at work (ref. daughter)	-0.00446***	-0.00293***	0.00739***

	(0.00134)	(0.00113)	(0.00088)
Mother's time at work x son	-0.00007	-0.00588***	0.00596***
	(0.00136)	(0.0011)	(0.00095)
Centrality	0.00011	-0.00007	-0.00003
	(0.0007)	(-0. 00006)	(0.00004)
Proportion of higher educated	0.00391	-0.0693	0.06539
	(0.8841)	(0.07664)	(0.05336)
Number of observations	6750		
Log likelihood	-4619.37		
LR chi2(22)	480.534		
Prob > chi2	3.42347e-89		
Pseudo R2	0.04944		

Note: *Significant at 10%, **Significant at 5%, *** Significant at 1%.
Standard deviation in parenthesis.
The model controls for the centrality of each municipality and the proportion of higher educated in each municipality.

The purpose of this thesis is to investigate the parental influence on children's educational choice. Hence, the average marginal effects for choosing an education equal to the father (j=1) or mother (j=2) will be the focus to discuss. The marginal effect shows if the probability increases or decreases in choosing an alternative with a change in an explanatory variable. A positive marginal effect shows that by a change in the explanatory variable, the individuals are more likely to choose the alternative. For a negative average marginal effect, the probability decreases by a change in the explanatory variable.

The first hypothesis states that an increase in parents' income affects the children's choice of choosing a similar education as the parents. The analysis uses the parents' hourly wage as a variable of earning. The marginal effects measure the changes in the probabilities for the dependent variable by a change in hourly wage by 10 kroners (this was done to better the readability of coefficients). The second column in Table 6 shows that an increase in father's hourly wage increases the probability that both daughters and sons choose a similar education as the fathers. The daughters' marginal effect is 0.00103, while it for sons is 0.00103 + 0.00273 = 0.00376. By the interaction, the effect for sons is significantly stronger than for daughters. The results show that both daughters and sons are more likely to choose the same education as their father when his hourly wage increases. The hypothesis is true for fathers'

wage raise. Hence, an increase in wages does influence the children to choose a similar education as fathers. An increase in mothers' hourly wages increases the probability of both daughters and sons choosing a similar education as mothers. Like for fathers' wage raise, the effect is significantly stronger for sons than daughters. Moreover, the probability of choosing a similar education as one parent if the other parent has increased wage is reduced, which also confirms the hypothesis. These marginal effects by a change in fathers' and mothers' wages show that the results follow the first hypothesis. An increase in parents' income makes the children more likely to choose a similar education.

According to the theory by Schneebaum et al. (2014) and Dryler (1998), girls tend to be more influenced by their mothers and sons by their fathers. Hence, the second hypothesis state that children are more influenced by the parent having the same gender. The marginal effects of an increase in mothers' and fathers' hourly wages show that the probability of daughters and sons choosing a similar education as the parent increases. However, for both situations, the effects are significantly stronger for sons. The result shows that both parents affect their son's choice more than their daughter's choice. That sons are more influenced than the daughters by their fathers follows the theory. However, sons are more affected than the daughters by the mothers, which does not confirm the same-gender hypothesis. According to Gang and Zimmermann (2000), parents influence the education of children by increased incomes, and by being more home, two separate effects. By considering an increase in the hours spent home for mothers (the inverse of the *mother's time at work* variable*)*, it is decreasing the probability of choosing a similar education as the mothers. The theory assumed the opposite effect. However, the effects are significantly stronger for sons. Hence, this effect does not confirm the same-gender hypothesis either.

Further, the results show that the marginal effects of an increase in mothers' wages are stronger than the marginal effects of an increase in fathers' wages. An increase in the mothers' wages increases the probability of choosing a similar education more than an increase in fathers' wages do. Hence the mothers have a greater influence on their children than the father. This applies to both daughters and sons, but sons have a significantly stronger effect. This result neither confirms to the same-gender hypothesis. Moreover, Gang and Zimmermann (2000) assume that by an income increase, fathers would have a stronger influence on the children's educational attainment than the mother. The marginal effects show, however, an opposite effect than the theory predicted for educational attainment.

5.2 Estimation separated into prestige levels

The previous section presented the results for the multinomial logit regression that included all educations in the dataset, independent of prestige levels. According to Becker and Tomes (1979) and Black and Devereux (2011), higher parental incomes or education give higher possibilities for investments in the children's human capital and higher possibility for increased influence. Even if all educations included are educations of a higher level, the expected incomes for each education vary. Some educations often give higher incomes than others. By the third hypothesis I want to investigate whether the influence is greater for educations receiving higher incomes, hence the high prestige educations. The hypothesis states that self-recruitment is higher for the educations of higher prestige. Tables 7-9 show the average marginal effects of the multinomial logit regression, which are limited to high prestige educations, middle prestige educations, and low prestige educations, separately.

Table 7: *Estimated average marginal effects of children's educational choice, high prestige*

Explanatory variables	Different education (j=0)	Same education as father (j = 1)	Same education as mother (j = 2)
Father's wage rate (ref. daughter)	-0.00672***	0.00635***	0.00037
	(0.00072)	(0.00065)	(0.00041)
Father's wage rate x son	-0.00912***	0.00761***	0.00151***
	(0.00073)	(0.00065)	(0.00044)
Mother's wage rate (ref. daughter)	-0.00024	-0.00532***	0.00556***
	(0.0013)	(0.00127)	(0.00046)
Mother's wage rate x son	-0.00055	-0.00411***	0.00467***
	(0.00117)	(0.0011)	(0.00045)
Father's time at work (ref. daughter)	-0.00631***	0.0056***	0.0007
	(0.00232)	(0.00207)	(0.00135)
Father's time at work x son	-0.01106***	0.00774***	0.00331**
	(0.00233)	(0.00202)	(0.00331)
Mother's time at work (ref. daughter)	-0.00733***	-0.00166	0.00899***
	(0.00197)	(0.00169)	(0.00131)
Mother's time at work x son	0.00012	-0.00558***	0.00546***
	(0.00187)	(0.00156)	(0.00125)

Centrality	0.00001	0	-0.00002
	(0.00011)	(0.0001)	(0.00007)
Proportion of higher educated	-0.0454	-0.10411	0.14952*
	(0.12017)	(0.11516)	(0.07718)
Number of observations	3104		
Log likelihood	-1947.33		
LR chi2(22)	596.942		
Prob > chi2	1.2685e-113		
Pseudo R2	0.1329		

Note: *Significant at 10%, **Significant at 5%, *** Significant at 1%.
Standard deviation in parenthesis.
The model controls for the centrality of each municipality and the proportion of higher educated in each municipality.

Table 8: *Estimated average marginal effects of children's educational choice, middle prestige*

Explanatory variables	Different education (j=0)	Same education as father (j = 1)	Same education as mother (j = 2)
Father's wage rate (ref. daughter)	0.00074	-0.00075	0.00001
	(0.00155)	(0.00144)	(0.00076)
Father's wage rate x son	-0.00001	0.00132	-0.0013
	(0.00148)	(0.00126)	(0.00096)
Mother's wage rate (ref. daughter)	0.00087	-0.00533**	0.00446***
	(0.00232)	(0.00228)	(0.0008)
Mother's wage rate x son	-0.00072	-0.00455**	0.00528***
	(0.00241)	(0.00226)	(0.00108)
Father's time at work (ref. daughter)	-0.02153***	0.01676***	0.00476**
	(0.00461)	(0.00432)	(0.00238)
Father's time at work x son	-0.01848***	0.01606***	0.00242
	(0.00445)	(0.00392)	(0.00282)
Mother's time at work (ref. daughter)	-0.00069	-0.00657**	0.00727***
	(0.00317)	(0.00274)	(0.00195)
Mother's time at work x son	-0.00187	-0.00788***	0.00975***
	(0.00344)	(0.00228)	(0.00269)
Centrality	0.00014	-0.00006	-0.00007

	(0.00018)	(0.00016)	(0.00009)
Proportion of higher educated	-0.08932	0.16317	-0.07384
	(0.65532)	(0.17682)	(0.11391)
Number of observations	1205		
Log likelihood	-790.066		
LR chi2(22)	125.746		
Prob > chi2	2.43593e-17		
Pseudo R2	0.07371		

Note: *Significant at 10%, **Significant at 5%, *** Significant at 1%.
Standard deviation in parenthesis.
The model controls for the centrality of each municipality and the proportion of higher educated in each municipality.

Table 9: *Estimated average marginal effects of children's educational choice, low prestige*

Explanatory variables	Different education (j=0)	Same education as father (j = 1)	Same education as mother (j = 2)
Father's wage rate (ref. daughter)	0.01136***	-0.00789***	-0.00346***
	(0.00113)	(0.00103)	(0.00077)
Father's wage rate x son	0.00885***	-0.00696***	-0.00188**
	(0.00126)	(0.00117)	(0.0008)
Mother's wage rate (ref. daughter)	0.00029	-0.0039**	0.00361***
	(0.00174)	(0.00164)	(0.00094)
Mother's wage rate x son	-0.00017	-0.00224	0.00242**
	(0.00168)	(0.00155)	(0.00097)
Father's time at work (ref. daughter)	0.01235***	-0.00924***	-0.00311*
	(0.00247)	(0.00207)	(0.00164)
Father's time at work x son	0.01408***	-0.01079***	-0.00328*
	(0.0026)	(0.0022)	(0.00177)
Mother's time at work (ref. daughter)	-0.00224	-0.00313*	0.00537***
	(0.00212)	(0.00173)	(0.00152)
Mother's time at work x son	-0.00098	-0.00383**	0.00482***
	(0.00229)	(0.00188)	(0.00167)
Centrality	0.00011	-0.00009	-0.00002
	(0.00011)	(0.00009)	(0.00008)

Proportion of higher educated	0.10749	-0.16195	0.05446
	(0.13974)	(0.11815)	(0.09531)
Number of observations	2441		
Log likelihood	-1626.39		
LR chi2(22)	254.745		
Prob > chi2	1.25945e-42		
Pseudo R2	0.07262		

Note: *Significant at 10%, **Significant at 5%, *** Significant at 1%.
Standard deviations in parenthesis.
The model controls for the centrality of each municipality and the proportion of higher educated in each municipality.

An increase in fathers' hourly wages gives an increased probability of children choosing a similar education for high prestige education. The effect is significantly stronger for the sons. However, for the educations classified as lower prestigious educations, an increase in father's wage makes it less likely that the children choose the same education as the father. Like for the high-prestige educations, the effects are significantly stronger for sons. By considering an increase in mother's wages, the probability of choosing the same education as the mother increases for all prestige levels. Moreover, the effects are stronger for children with a high prestige education and weaker by having a low prestige education. Normally, a Wald test could test whether the coefficients were differing significantly, but microdata.no has not yet included the test in its analytic tool box. Hence, the probability of children choosing the same education as their mothers increases more the higher the prestige. The effects are significantly stronger for the sons. The marginal effects show that it is more likely to choose an education similar to the parents, the higher the prestige. These results confirm the third hypothesis. However, an interesting aspect is how the effects of an increase in fathers' wages change from being positive to negative when moving from high prestige to lower prestige. An increase in father's wage makes it more likely for children to choose the same education for high prestige, while for low prestige, the probability decreases. These marginal effects confirm the first hypothesis that an increase in parents' income makes it more likely that children choose a similar education as the parent having the wage rise. An increase in wage increases the probability of choosing the same education as the parent, for all prestige levels, except for lower prestige, where an increase in fathers' income reduces the probability. Moreover, an increase in fathers' hours home decreases the probability of choosing a similar education, for

both genders in the case of high prestige, while it for low prestige increases the probability of choosing the same education. Keep in mind that the hours spent home are the inverse of time at work.

Further, the effects of parents spending more time home are significantly stronger for sons independent of prestige level and which parent is home. This latter result does not confirm the same-gender hypothesis since mothers are more likely to influence the sons by spending more time home.

6 Conclusion

This master's thesis has been investigated the parental influence on their children's choice of educational fields for higher education in Norway. Intergenerational mobility in education is the base for this research, and several researchers have investigated the intergenerational mobility in education lengths. However, the number of individuals that has a master's degree have increased over the past years. An investigation considering the mobility in educational fields is an innovative approach for the field of intergenerational mobility. This master's thesis has investigated whether children are more or less likely to choose a similar education as their parents by multinomial logistic regression. This section will contain a discussion around the presented results, and whether they are following the theory and hypotheses. If the results differ from hypotheses and theory, what are the mechanisms that drive such results?

The first hypothesis stated that parents with higher incomes would have a stronger influence on their children. The results show that independent on prestige level, an increase in parents' hourly wage increased the probability of children choosing a similar education. The only exception was for fathers' wage increase for low prestige educations. Becker and Tomes (1979) and Black and Devereux (2011) explain how children's income and education are dependent on their parents' income and education. This relation is partly dependent on human capital investments by parents. Children often have a higher knowledge of their parents' education, according to Helland (2006). This knowledge is transmitted from parents to children, for instance, through discussions or that the parents have a higher possibility of helping them with school subjects close to their own education field, which is also a sort of human capital investments, that would increase the influence. According to Solon (2004), parents have a greater incentive to invest in children's human capital if the investments give a higher return in the form of higher education or incomes. Hence, the transmission of knowledge from parents to children might be greater for parents with higher incomes since their knowledge might lead to educations achieving higher incomes. These are factors that can explain why parents with increased incomes have a stronger influence on their children and help to confirm the first hypothesis.

According to Gang and Zimmermann (2000), fathers have a greater influence on children by increasing incomes. However, the results show that a wage raise for mothers increased the probability of choosing a similar education more than for fathers. Hence, mothers have a greater effect on children choosing the same education than the fathers by a wage increase.

This result shows the opposite of what theory expected. However, Gang and Zimmermann (2000) assume that mothers do not work full time, as the fathers do. The mothers in this analysis have completed a master's degree, and it is likely to assume that these mothers do spend more time at work. The limitation on the parents' working hours might not fit this group of mothers, who includes only higher educated mothers. Statistics from Statistic Norway show that numbers of mothers in the labor market increased in the last decades, from 55.1% in 1980 to 67.5 % in 2019. As the proportion of women who participate in the labor market has increased, it has approached the proportion of men working in 2019, which were 73.4%. These statistics show that women participate more in the labor market now than in the last decades. Also, the gap between women and men that have completed a master's degree is decreasing every year. In 2018 there were 10.6 % men that had completed education of 4 years or more and 9.5% women (SSB, 2018). These statistics show that women probably are spending more hours at work than previous and that the proportion of women having a higher education has increased. These are factors showing that mothers contribute more to the household's income and are more equal to the fathers' contribution than previously. It is probably reasonable to assume that mothers who have a higher education have a stronger position and more power in a family. This increased power within the family and the increased equality of genders in Norway might be factors explaining why mothers have a greater influence on their children's educational choices by a wage increase than expected through the theory.

Sons are more affected by their fathers, and daughters are more affected by their mother, are stated by the second hypothesis. The results show that sll the average marginal effects are significantly stronger for the sons than the daughters, independent by a change in hourly wages or hours spent home. The fact that sons are more likely to follow the father is expected by the theory. Sons being more influenced than daughters by their mothers, shows the opposite of what theory states. Helland (2006) describes that children might choose an education based on getting a higher or equal position at the social ladder compared to the parents, which can be a mechanism affecting the children's educational choice. On average, men have the highest incomes, and previously, the difference between the number of men and women having master's degrees was greater. Sons might wish to achieve a higher social position compared to their mother. Hence, when mothers' wages increase, the desire to achieve a higher position increases even more. The results show that the sons are more influenced than the daughter. Daughters might be interpreted as less affectable by their

parents' social background, and, therefore, do not have the same desire to achieve a greater position than both the parents, compared to the sons' desire.

The third hypothesis states that parents influence more children with high prestige educations than children belonging to other prestige levels. The average marginal effects show that children with high prestige educations are more likely to choose a similar education as the parents by an increase in parental wages. This result is independent of which parent that has an increased wage. These effects are expected according to the intergenerational mobility model by Becker and Tomes (1979) and by Solon (2004), who says that parents are more motivated to invest in human capital if it gives higher returns, like higher incomes. If parents with high-prestige educations affect their children to choose the same education, the children will also have an education of high prestige and probably achieve higher future incomes, which is a motivation for the parents' investments. This reasoning confirms the third hypothesis, as well as the first hypothesis.

An interesting result is the decreased probability of choosing similar education as fathers by an increase in fathers' incomes for low prestige educations. By including the results for high prestige educations, where fathers' effects were even greater than mothers' effects, it is reasonable to discuss whether income is more important for fathers than mothers. Gang and Zimmermann (2000) are predicting that fathers only affect the children's education through their earned incomes. The result confirms the connection to the theory. Fathers who have lower incomes do not manage to influence the children to choose the same education by a wage raise, and fathers having the highest incomes increase their educational influence even more by increased wages. Income seems to be of less importance for children with educations of low prestige. Children choosing educations of low prestige might not be that interested and driven by higher status and incomes. According to Becker and Tomes (1979), inherited endowments are factors that can affect children's income and education, in addition to human capital investments. For fathers spending more time home, it is more likely that the children choose a similar education for low prestige. Hence, it is reasonable to discuss whether families with children that chose low prestige educations have other values of what is important for them than the families of high prestige. If incomes are of less importance, their educational influence will maybe be related to other factors. However, since these results do not follow the theory, it might be appropriate to investigate this further in other research.

The decreased probability of choosing the same education as fathers for low prestige would according to the household production theory, probably be more expected for an increase in mothers' wages instead of for fathers. If mothers increase their work (and income), they simultaneously decrease their time at home. An increase in income increases the impact on children's education. However, mothers have an alternative cost for spending less time home for the educating, which will lower the influence of an income increase. This means that the influence mothers do when spending time home also affects the children's choice of education, according to theory. However, for this analysis, the theory seems to fit better for fathers with low prestige educations. Even if the theory states the opposite, mothers seem to have a greater influence than the fathers on the children's educational choice by increased wages. Moreover, fathers with educations of low prestige tend to have an opposite impact than assumed by the theory. One could discuss whether there have been some changes in gender roles, especially for low prestige. The parents included in this analysis, are parents having master's degrees. Hence, they are achieving higher incomes and spending less time home, and this also includes mothers. It can be reasonable to discuss whether the used theory does not apply to such a group since the preconditions are different from those in theory. Another approach is that the gender-equality in Norway has increased over the past decades, which might give results that depart from a theory developed several years ago.

Becker and Tomes (1979) and Black and Devereux (2011) are, in addition to the human capital investments, describing how the inherited endowments between generations also affect the children's incomes and attained education. The inherited endowments are exemplified by being abilities, skills, or other values transmitted from parents to children. These endowments can be related to the mechanism Helland (2006) uses to describe how families that belong to different status groups value education differently. If one of the parents is a doctor, the children probably value educations like medicine more than other educations because those values are inherited from their parents. The transmitted endowments are factors that partly create values, preferences, and interests the children have for specific education fields and are important factors when discussing the choice of educational fields. Through this thesis, the focus has been on the impact of parental wages and their hours spent at home. Interests and values are more challenging to measure and are not a part of the estimations done in this analysis. This approach might be a starting point for further research investigating the parents' educational influence on children's choice of educational fields.

The purpose of this master's thesis was to investigate whether the parents influenced the children's choice of higher education fields. Sociologists have already shown an interest in this field. However, economists have investigated the intergenerational mobility for educational lengths, but not for the educational fields. The number of parents with a master's degree has increased in the past years. Hence, research like this is of high relevance by considering the development in higher education. The results confirmed two of the hypotheses. For the same-gender hypothesis, there were some results partly showing the opposite effect. Importance by investigating intergenerational mobility is its effects on the inequalities in societies. Continued lower intergenerational mobility will increase inequality. This analysis showed that the probability of choosing similar education as parents increased most for the high prestige educations. That is, intergenerational mobility is lower for higher prestige. If these effects are unchanged or even increases, the gap between the individuals of high prestige and the others will increase. This increased gap gives a higher degree of inequality between the societies' prestige groups and the others. An increased inequality gives unequal possibilities, and those children who belong to families with a prestigious background will probably have some advantages by only being a part of the family and having a greater possibility of achieving prestigious educations. Situations like that can motivate societies and politicians to pay attention of their degree of mobility in education and try to achieve a more mobile society.

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Appendix

Appendix A: Educations categorized by the third digit by NUS2000. Retrieved from Statistics Norway https://www.ssb.no/en/klass/klassifikasjoner/36/

70 General subjects	**71 Humanities and arts**	**73 Social sciences and law**
701 General subjects	711 Languages	731 Political science
	712 Literature and librarianship	732 Sociology
	713 History and Philosophy	733 Social geography
	714 Religion	734 Economics
	715 Music, dance and drama	735 Media and information
	716 Visual art and crafts	736 Psychology
	719 Humanities and arts, other	737 Law
		738 Social anthropology
		739 Social sciences and law, other
74 Business and administration	**75 Natural sciences, vocational and technical subjects**	**76 Health, welfare and sport**
741 Business and administration	751 Biology	761 Nursing and caring
742 Wholesale and retail sales and marketing	752 Physics and chemistry	762 Social services
	753 Mathematics and statistics	763 Medicine
743 Secretarial and office skills	754 Information and computer theory	764 Dental health
		765 Therapy
744 Hotel, travel and tourism	755 Electrical, electronic, mechanical and machine subjects	766 Pharmacy
		767 Veterinary medicine
749 Business and administration, other	756 Earth sciences	768 Sport and physical education
	757 Building and construction	769 Health, welfare and sport, other
	758 Manufacturing and extraction	

	759 Natural sciences, vocational and technical subjects, other	
77 Primary industries	**78 Transport and communications, safety and security and other services**	**79 Unspecified field of study**
771 Fisheries and aquaculture 772 Agriculture 773 Horticulture 774 Forestry 779 Primary industries, other	781 Transport and communications 782 Safety and security 783 Other services 789 Transport and communications, safety and security and other services, other	799 Unspecified subject group

Appendix B: The log-odds for all regressions.

For all educations:

```
utd» mlogit elite i.mann#c.timelønnmor_gj10 i.mann#c.timelønnfar_gj10 i.mann#c.gjarbtimer_mor_uke
i.mann#c.gjarbtimer_far_uke c.bosted c.andel_høyereutd, mfx(dydx)
```

Antall iter: 7 — LR chi2(22): 480.543
Log sans: -4619.37 — Prob > chi2: 3.42347e-89
Antall obs: 6750 — Pseudo R2: 0.04944

elite		Coef.	Std.feil	z	P>|z|	[95% Konf.	intervall]
1	bosted	-0.0006	0.00046	-1.30638	0.19142	-0.0015	0.0003
	andel_høyereutd	-0.41165	0.53523	-0.76909	0.44183	-1.4607	0.6374
	mann 0 × gjarbtimer_far_uke	0.00246	0.0097	0.25426	0.79928	-0.01656	0.02149
	mann 1 × gjarbtimer_far_uke	0.00845	0.00958	0.88212	0.37771	-0.01032	0.02723
	mann 0 × gjarbtimer_mor_uke	-0.01213	0.00795	-1.52469	0.12733	-0.02772	0.00346
	mann 1 × gjarbtimer_mor_uke	-0.0345	0.00776	-4.44531	0	-0.04971	-0.01929
	mann 0 × timelønnfar_gj10	0.00616	0.00331	1.86055	0.0628	-0.00032	0.01265
	mann 1 × timelønnfar_gj10	0.01904	0.00338	5.62004	1.90912e-8	0.0124	0.02568
	mann 0 × timelønnmor_gj10	-0.02896	0.00661	-4.38051	0.00001	-0.04191	-0.016
	mann 1 × timelønnmor_gj10	-0.02377	0.006	-3.95761	0.00007	-0.03555	-0.012
	Konst	-0.01861	0.45817	-0.04062	0.96759	-0.91662	0.8794
2	bosted	-0.00067	0.00074	-0.90251	0.36678	-0.00212	0.00078
	andel_høyereutd	0.96117	0.84399	1.13884	0.25476	-0.69301	2.61537
	mann 0 × gjarbtimer_far_uke	-0.00603	0.01501	-0.40158	0.68798	-0.03546	0.0234
	mann 1 × gjarbtimer_far_uke	0.00603	0.01628	0.37053	0.71098	-0.02587	0.03794
	mann 0 × gjarbtimer_mor_uke	0.1144	0.01378	8.30083	1.03379e-16	0.08739	0.14142
	mann 1 × gjarbtimer_mor_uke	0.08815	0.01486	5.9312	3.00719e-9	0.05902	0.11728
	mann 0 × timelønnfar_gj10	-0.01455	0.00524	-2.77586	0.0055	-0.02483	-0.00427
	mann 1 × timelønnfar_gj10	0.00042	0.00575	0.07448	0.94062	-0.01085	0.01171
	mann 0 × timelønnmor_gj10	0.07464	0.00587	12.7144	4.91309e-37	0.06314	0.08615
	mann 1 × timelønnmor_gj10	0.06468	0.00617	10.4819	1.04528e-25	0.05258	0.07677
	Konst	-7.22874	0.7178	-10.0705	7.45311e-24	-8.63562	-5.82187

Figure 1: Output from microdata.no. Show the log-odds with j=0 (different education) as base category. For all educations.

For high prestige:

```
utd» mlogit elite i.mann#c.timelønnmor_gj10 i.mann#c.timelønnfar_gj10 i.mann#c.gjarbtimer_mor_uke
i.mann#c.gjarbtimer_far_uke c.bosted c.andel_høyereutd if utdfelt == 1 | utdfelt == 2 | utdfelt == 3,
mfx(dydx)
```

Antall iter: 7 — LR chi2(22): 596.942
Log sans: -1947.33 — Prob > chi2: 1.2685e-113
Antall obs: 3104 — Pseudo R2: 0.1329

elite		Coef.	Std.feil	z	P>|z|	[95% Konf.	intervall]
1	bosted	0.00004	0.00074	0.0549	0.95621	-0.00141	0.00149
	andel_høyereutd	-0.55392	0.82777	-0.66917	0.50338	-2.17634	1.06848
	mann 0 × gjarbtimer_far_uke	0.04152	0.0149	2.78603	0.00533	0.01231	0.07073
	mann 1 × gjarbtimer_far_uke	0.0605	0.01466	4.1254	0.00003	0.03176	0.08925
	mann 0 × gjarbtimer_mor_uke	-0.00002	0.01226	-0.00181	0.99855	-0.02407	0.02402
	mann 1 × gjarbtimer_mor_uke	-0.03314	0.01133	-2.92378	0.00345	-0.05535	-0.01092
	mann 0 × timelønnfar_gj10	0.04648	0.00486	9.55251	1.26585e-21	0.03694	0.05601
	mann 1 × timelønnfar_gj10	0.05715	0.005	11.4127	3.61199e-30	0.04734	0.06697
	mann 0 × timelønnmor_gj10	-0.03112	0.0094	-3.31083	0.00093	-0.04954	-0.01269
	mann 1 × timelønnmor_gj10	-0.02357	0.0082	-2.87439	0.00404	-0.03964	-0.00749
	Konst	-3.88584	0.73226	-5.3066	1.11686e-7	-5.32106	-2.45063
2	bosted	-0.00042	0.00134	-0.31528	0.75254	-0.00305	0.00221
	andel_høyereutd	2.71281	1.45818	1.86041	0.06282	-0.14516	5.57079
	mann 0 × gjarbtimer_far_uke	0.02099	0.02571	0.81672	0.41408	-0.02939	0.07139
	mann 1 × gjarbtimer_far_uke	0.07367	0.02758	2.67059	0.00757	0.0196	0.12773
	mann 0 × gjarbtimer_mor_uke	0.16941	0.02459	6.88896	5.61978e-12	0.12121	0.21761
	mann 1 × gjarbtimer_mor_uke	0.09673	0.02355	4.10681	0.00004	0.05057	0.1429
	mann 0 × timelønnfar_gj10	0.01558	0.00805	1.93425	0.05308	-0.0002	0.03138
	mann 1 × timelønnfar_gj10	0.03901	0.00874	4.45986	0	0.02186	0.05615
	mann 0 × timelønnmor_gj10	0.09906	0.0088	11.251	2.28951e-29	0.0818	0.11632
	mann 1 × timelønnmor_gj10	0.08356	0.00865	9.65986	4.46432e-22	0.06661	0.10052
	Konst	-13.1163	1.26124	-10.3995	2.49195e-25	-15.5883	-10.6443

Figure 2: Output from microdata.no. The log-odds with j=0 (different education) as base category. For high prestige educations.

For middle prestige educations:

```
utd» mlogit elite i.mann#c.timelønnmor_gj10 i.mann#c.timelønnfar_gj10 i.mann#c.gjarbtimer_mor_uke
i.mann#c.gjarbtimer_far_uke c.bosted c.andel_høyereutd if utdfelt == 11 | utdfelt == 12 | utdfelt == 13,
mfx(dydx)
```

Antall iter: 8 — LR chi2(22): 125.746
Log sans: -790.066 — Prob > chi2: 2.43593e-17
Antall obs: 1205 — Pseudo R2: 0.07371

elite		Coef.	Std.feil	z	P>|z|	[95% Konf.	intervall]
1	bosted	-0.00055	0.00109	-0.50395	0.61429	-0.0027	0.0016
	andel_høyereutd	1.03438	1.20819	0.85614	0.39192	-1.33362	3.40238
	mann 0 × gjarbtimer_far_uke	0.1206	0.02978	4.04926	0.00005	0.06222	0.17898
	mann 1 × gjarbtimer_far_uke	0.1131	0.02704	4.18191	0.00002	0.06009	0.1661
	mann 0 × gjarbtimer_mor_uke	-0.03669	0.01892	-1.93885	0.05251	-0.07379	0.00039
	mann 1 × gjarbtimer_mor_uke	-0.0428	0.01818	-2.35434	0.01855	-0.07844	-0.00717
	mann 0 × timelønnfar_gj10	-0.00517	0.00986	-0.52457	0.59988	-0.0245	0.01415
	mann 1 × timelønnfar_gj10	0.00754	0.00863	0.8741	0.38206	-0.00937	0.02447
	mann 0 × timelønnmor_gj10	-0.03142	0.01574	-1.99605	0.04592	-0.06228	-0.00056
	mann 1 × timelønnmor_gj10	-0.02513	0.01568	-1.60254	0.10903	-0.05587	0.0056
	Konst	-3.51469	1.23167	-2.85359	0.00432	-5.92872	-1.10065
2	bosted	-0.00143	0.00183	-0.78256	0.43388	-0.00503	0.00216
	andel_høyereutd	-1.19034	2.11594	-0.56256	0.57373	-5.33751	2.95682
	mann 0 × gjarbtimer_far_uke	0.1086	0.04435	2.44823	0.01435	0.02165	0.19554
	mann 1 × gjarbtimer_far_uke	0.06397	0.05275	1.21275	0.22522	-0.03941	0.16736
	mann 0 × gjarbtimer_mor_uke	0.12826	0.03522	3.64087	0.00027	0.05921	0.19731
	mann 1 × gjarbtimer_mor_uke	0.17319	0.04853	3.56843	0.00035	0.07806	0.26832
	mann 0 × timelønnfar_gj10	-0.00066	0.01422	-0.04656	0.96286	-0.02855	0.02722
	mann 1 × timelønnfar_gj10	-0.02291	0.01783	-1.2843	0.19903	-0.05787	0.01205
	mann 0 × timelønnmor_gj10	0.07718	0.01435	5.37638	7.59958e-8	0.04904	0.10532
	mann 1 × timelønnmor_gj10	0.09347	0.0193	4.84086	0	0.05562	0.13132
	Konst	-11.0084	2.07596	-5.30279	1.14042e-7	-15.0772	-6.93959

Figure 3: Output from microdata.no. Show the log-odds with j=0 (different education) as base category. For middle prestige educations.

For low prestige educations:

```
utd» mlogit elite i.mann#c.timelønnmor_gj10 i.mann#c.timelønnfar_gj10 i.mann#c.gjarbtimer_mor_uke
i.mann#c.gjarbtimer_far_uke c.bosted c.andel_høyereutd if utdfelt == 21 | utdfelt == 22 | utdfelt == 23 |
utdfelt == 26 , mfx(dydx)
```

Antall iter: 6 — LR chi2(22): 254.745
Log sans: -1626.39 — Prob > chi2: 1.25945e-42
Antall obs: 2441 — Pseudo R2: 0.07262

elite		Coef.	Std.feil	z	P>|z|	[95% Konf.	intervall]
1	bosted	-0.00077	0.00076	-1.02165	0.30694	-0.00227	0.00071
	andel_høyereutd	-1.22848	0.94895	-1.29457	0.19546	-3.0884	0.63142
	mann 0 × gjarbtimer_far_uke	-0.08015	0.01692	-4.73441	0	-0.11333	-0.04697
	mann 1 × gjarbtimer_far_uke	-0.09304	0.01791	-5.19281	2.07141e-7	-0.12815	-0.05792
	mann 0 × gjarbtimer_mor_uke	-0.01678	0.01403	-1.19612	0.23164	-0.04428	0.01071
	mann 1 × gjarbtimer_mor_uke	-0.02338	0.01513	-1.54541	0.12224	-0.05303	0.00627
	mann 0 × timelønnfar_gj10	-0.06976	0.00846	-8.24314	1.6774e-16	-0.08635	-0.05318
	mann 1 × timelønnfar_gj10	-0.05964	0.00942	-6.32535	2.52644e-10	-0.07812	-0.04116
	mann 0 × timelønnmor_gj10	-0.02593	0.01323	-1.96009	0.04998	-0.05187	-0
	mann 1 × timelønnmor_gj10	-0.01437	0.01247	-1.15261	0.24906	-0.03882	0.01007
	Konst	5.80982	0.81267	7.14897	8.74294e-13	4.21699	7.40264
2	bosted	-0.00044	0.00107	-0.4102	0.68165	-0.00254	0.00166
	andel_høyereutd	0.4729	1.26954	0.3725	0.70951	-2.01535	2.96117
	mann 0 × gjarbtimer_far_uke	-0.05692	0.02217	-2.56729	0.01024	-0.10038	-0.01346
	mann 1 × gjarbtimer_far_uke	-0.06174	0.02381	-2.5931	0.00951	-0.1084	-0.01507
	mann 0 × gjarbtimer_mor_uke	0.06743	0.02012	3.35012	0.0008	0.02798	0.10688
	mann 1 × gjarbtimer_mor_uke	0.05885	0.02213	2.6595	0.00782	0.01548	0.10223
	mann 0 × timelønnfar_gj10	-0.05948	0.01036	-5.73719	9.62578e-9	-0.07981	-0.03916
	mann 1 × timelønnfar_gj10	-0.03668	0.01078	-3.40261	0.00066	-0.05781	-0.01555
	mann 0 × timelønnmor_gj10	0.04245	0.01247	3.40264	0.00066	0.018	0.06691
	mann 1 × timelønnmor_gj10	0.02901	0.01292	2.2452	0.02475	0.00368	0.05434
	Konst	-1.30781	1.06309	-1.23019	0.21862	-3.39145	0.77581

Figure 4: Output from microdata.no. Show the log-odds with j=0 (different education) as base category. For low prestige educations.

APPENDIX C (microdata.no syntax)

```
create-dataset utd

import BEFOLKNING_KJOENN as kjønn
import BEFOLKNING_FAR_FNR as far_fnr
import BEFOLKNING_MOR_FNR as mor_fnr
import BEFOLKNING_FOEDSELS_AAR_MND as birthyear
import NUDB_KOMM_16 as bosted                                   // brukes til sentralitet
import NUDB_KOMM_16 as bosted1                                  // brukes til andel høyere utdannede i hver
kommune
destring bosted, force
destring bosted1, force


// Begrenser til personer født mellom 1980 og 1995:

generate cohort = int(birthyear/100)
keep if cohort >= 1980 & cohort <= 1992
tabulate cohort

//// Barna: født mellom 1980-1992 som selv har masterutdanning

import NUDB_BU 2016-08-31 as utd16
generate utdfelt = substr(utd16, 1, 3)
tabulate cohort
destring utdfelt, force
keep if utdfelt >= 700 & utdfelt < 800                          //Begrenser til personer født mellom 1980 og
1992 som selv har masterutdanning
recode utdfelt   (737 741 = 1) (752 756 755= 2) (763 = 3) ( 736 734 = 11) (754 757 758 = 12) (766 764 = 13)
(731/749 = 21) (751/759 = 22) (761/769 = 23) (700/799 = 26)

//High prestige
// 1 = Business & administration
// 2 = Enginieer
// 3 = Medicine

//Middle prestige:
// 11 = Psychology and Economics
// 12 = Engineer
// 13 = Odontology and pharmacy

// Low prestige
// 21 = Social science, remaining
// 22 = Nature Science, remaining
// 23 = Health, remaining
// 26 = Others

// 31 = One of parents have bachelor of the other master




////// Mor og fars utdanning
import NUDB_NUS2000_FAR_16 as farutd
import NUDB_NUS2000_MOR_16 as morutd

generate utdfar = substr(farutd, 1, 3)
```

```
generate utdmor = substr(morutd, 1, 3)

destring utdmor, force
destring utdfar, force

keep if (utdfar >= 700 & utdfar < 800) | (utdmor >= 700 & utdmor < 800) | (utdfar >= 700 & utdfar < 800) &
(utdmor >= 700 & utdmor < 800)

recode utdfar ( 737 741 = 1) (752 756 755= 2) (763 = 3) (736 734 = 11) (754 757 758 = 12) (766 764 = 13)
(731/749 = 21) (751/759 = 22) (761/769 = 23) (700/799 = 26) (600/699 = 31) (0/599 = 32) ( 800/999 = 33)

recode utdmor ( 737 741 = 1) (752 756 755 = 2) (763 = 3) (736 734 = 11) (754 757 758 = 12) (766 764 = 13)
(731/749 = 21) (751/759 = 22) (761/769 = 23) (700/799 = 26) (600/699 = 31) (0/599 = 32) ( 800/999 = 33)

drop if utdmor == 32 | utdmor == 33 | utdfar == 32 | utdfar == 33                    // Beholder tilfellene hvor
mor/far har master hvor den andre har bachelor


// Dummy-variabel gender

generate mann = 0
replace mann = 1 if kjønn == '1'
tabulate mann


////////////// WORKING HOURS

////////////// working hours mothers, weekly, 2001-2012

create-dataset mor_arbtid
import REGSYS_ARBTIM 2001-11-01 as arbtim01
import REGSYS_ARBTIM 2002-11-01 as arbtim02
import REGSYS_ARBTIM 2003-11-01 as arbtim03
import REGSYS_ARBTIM 2004-11-01 as arbtim04
import REGSYS_ARBTIM 2005-11-01 as arbtim05
import REGSYS_ARBTIM 2006-11-01 as arbtim06
import REGSYS_ARBTIM 2007-11-01 as arbtim07
import REGSYS_ARBTIM 2008-11-01 as arbtim08
import REGSYS_ARBTIM 2009-11-01 as arbtim09
import REGSYS_ARBTIM 2010-11-01 as arbtim10
import REGSYS_ARBTIM 2011-11-01 as arbtim11
import REGSYS_ARBTIM 2012-11-01 as arbtim12

merge arbtim01 arbtim02  arbtim03  arbtim04  arbtim05  arbtim06  arbtim07  arbtim08  arbtim09  arbtim10
arbtim11  arbtim12 into utd on mor_fnr


////////////// working hours fathers, weekly, 2001-2012

create-dataset far_arbtid

import REGSYS_ARBTIM 2001-11-01 as arbtim01_f
import REGSYS_ARBTIM 2002-11-01 as arbtim02_f
import REGSYS_ARBTIM 2003-11-01 as arbtim03_f
import REGSYS_ARBTIM 2004-11-01 as arbtim04_f
import REGSYS_ARBTIM 2005-11-01 as arbtim05_f
import REGSYS_ARBTIM 2006-11-01 as arbtim06_f
import REGSYS_ARBTIM 2007-11-01 as arbtim07_f
import REGSYS_ARBTIM 2008-11-01 as arbtim08_f
import REGSYS_ARBTIM 2009-11-01 as arbtim09_f
```

```
import REGSYS_ARBTIM 2010-11-01 as arbtim10_f
import REGSYS_ARBTIM 2011-11-01 as arbtim11_f
import REGSYS_ARBTIM 2012-11-01 as arbtim12_f

merge arbtim01_f arbtim02_f arbtim03_f arbtim04_f arbtim05_f arbtim06_f arbtim07_f arbtim08_f
arbtim09_f arbtim10_f arbtim11_f arbtim12_f into utd on far_fnr

use utd


////////////// Average weekly working hours


generate gjarbtimer_mor_uke = ( arbtim01 + arbtim02 + arbtim03 + arbtim04 + arbtim05 + arbtim06 + arbtim07
+ arbtim08 + arbtim09 + arbtim10 + arbtim11 + arbtim12)/12
generate gjarbtimer_far_uke = ( arbtim01_f + arbtim02_f + arbtim03_f + arbtim04_f + arbtim05_f + arbtim06_f
+ arbtim07_f + arbtim08_f + arbtim09_f + arbtim10_f + arbtim11_f + arbtim12_f)/12


/////// INCOME

// Income fathers, 2001-2012


create-dataset far_income

import INNTEKT_WLONN 2001-01-01 as farincome6
import INNTEKT_WLONN 2002-01-01 as farincome7
import INNTEKT_WLONN 2003-01-01 as farincome9
import INNTEKT_WLONN 2004-01-01 as farincome10
import INNTEKT_WLONN 2005-01-01 as farincome11
import INNTEKT_WLONN 2006-01-01 as farincome12
import INNTEKT_WLONN 2007-01-01 as farincome13
import INNTEKT_WLONN 2008-01-01 as farincome14
import INNTEKT_WLONN 2009-01-01 as farincome15
import INNTEKT_WLONN 2010-01-01 as farincome16
import INNTEKT_WLONN 2011-01-01 as farincome17
import INNTEKT_WLONN 2012-01-01 as farincome18


merge farincome6 farincome7 farincome9 farincome10 farincome11 farincome12 farincome13 farincome14
farincome15 farincome16 farincome17 farincome18 into utd on far_fnr


// Income mothers, 2001-2012

create-dataset mor_income

import INNTEKT_WLONN 2001-01-01 as morincome6
import INNTEKT_WLONN 2002-01-01 as morincome7
import INNTEKT_WLONN 2003-01-01 as morincome9
import INNTEKT_WLONN 2004-01-01 as morincome10
import INNTEKT_WLONN 2005-01-01 as morincome11
import INNTEKT_WLONN 2006-01-01 as morincome12
import INNTEKT_WLONN 2007-01-01 as morincome13
import INNTEKT_WLONN 2008-01-01 as morincome14
import INNTEKT_WLONN 2009-01-01 as morincome15
import INNTEKT_WLONN 2010-01-01 as morincome16
import INNTEKT_WLONN 2011-01-01 as morincome17
import INNTEKT_WLONN 2012-01-01 as morincome18
```

merge morincome6 morincome7 morincome9 morincome10 morincome11 morincome12 morincome13 morincome14 morincome15 morincome16 morincome17 morincome18 into utd on mor_fnr

use utd

////////////// Average yearly income

generate meanmor = (morincome6 + morincome7 + morincome9 + morincome10 + morincome11 + morincome12 + morincome13 + morincome14 + morincome15 + morincome16 + morincome17 + morincome18)/12

generate meanfar = (farincome6 + farincome7 + farincome9 + farincome10 + farincome11 + farincome12 + farincome13 + farincome14 + farincome15 + farincome16 + farincome17 + farincome18)/12

////////////// Average hourly wage = Average weekly income / Average weekly working hours

generate Imeanfar_uke = meanfar/52
generate timelønnfar_gj = Imeanfar_uke/gjarbtimer_far_uke
generate timelønnfar_gj10 = timelønnfar_gj/10

generate Imeanmor_uke = meanmor/52
generate timelønnmor_gj = Imeanmor_uke/gjarbtimer_mor_uke
generate timelønnmor_gj10 = timelønnmor_gj/10

/////// higher educated in each municipality

rename bosted1 andel_høyereutd

recode andel_høyereutd (101 = 0.260679825) (104 = 0.285692617) (105 = 0.226992897) (106 = 0.273630222) (111 = 0.278039832) (118 = 0.181019332) (119 = 0.179257787) (121 = 0.190053286) (122 = 0.17672512) (123 = 0.224843108) (124 = 0.207000317) (125 = 0.205015067) (127 = 0.175562269) (128 = 0.17997543) (135 = 0.240694375) (136 = 0.258239134) (137 = 0.231054978) (138 = 0.237158723) (211 = 0.326058557) (213 = 0.350603686) (214 = 0.414878778) (215 = 0.350125549) (216 = 0.436402016) (217 = 0.418857062) (219 = 0.507707339) (220 = 0.478961599) (221 = 0.18311488) (226 = 0.291536284) (227 = 0.272172272) (228 = 0.298316889) (229 = 0.225297374) (230 = 0.322540687) (231 = 0.301106026) (233 = 0.33221439) (234 = 0.292143862) (235 = 0.2586155) (236 = 0.20277183) (237 = 0.229684601) (238 = 0.213553) (239 = 0.193978495) (301 = 0.484225918)(402 = 0.216087482) (403 = 0.353930122) (412 = 0.224212812) (415 = 0.209409888) (417 = 0.26426499) (418 = 0.156503594) (419 = 0.179149644) (420 = 0.153290224) (423 = 0.174534011) (425 = 0.173349977) (426 = 0.177474403) (427 = 0.288322866) (428 = 0.187184116) (429 = 0.213398163) (430 = 0.231105286) (432 = 0.189122373) (434 = 0.185983827) (436 = 0.285927029) (437 = 0.271662246) (438 = 0.210307132) (439 = 0.223891811)(441 = 0.243814122) (501 = 0.382135956) (502 = 0.286524309) (511 = 0.184848485) (512 = 0.215302491) (513 = 0.191341529) (514 = 0.211195929) (515 = 0.190413657) (516 = 0.193387399) (517 = 0.180960032) (519 = 0.195019157) (520 = 0.185165563) (521 = 0.234047563) (522 = 0.201969492) (528 = 0.221505203) (529 = 0.203498489) (532 = 0.209139488) (533 = 0.246225638) (534 = 0.208656158) (536 = 0.19023189) (538 = 0.172181915) (540 = 0.186320755) (541 = 0.191082803) (542 = 0.225245234) (543 = 0.202785515) (544 = 0.231716418) (545 = 0.23149492) (602 = 0.315552816) (604 = 0.37183968) (605 = 0.249314516) (612 = 0.360874398) (615 = 0.189636163) (616 = 0.22058319) (617 = 0.219608879) (618 = 0.278713629) (619 = 0.244357977) (620 = 0.240862477) (621 = 0.163272351) (622 = 0.227224576) (623 = 0.206043471) (624 = 0.236002449) (625 = 0.233295872) (626 = 0.338117163) (627 = 0.326786883) (628 = 0.256103896) (631 = 0.208140611) (632 = 0.216329966) (633 = 0.180243446) (701 = 0.299054905) (704 = 0.352113083) (711 = 0.214377407) (709 = 0.22529081) (713 = 0.243331077

) (715 714 702 = 0.247969656) (716 = 0.230841751) (706 = 0.2443115867) (728 722 = 0.327072761) (805 = 0.26918528) (806 = 0.264956685) (807 = 0.249333587) (811 = 0.222631579) (814 = 0.225992593) (815 = 0.230777865) (817 = 0.166715414) (819 = 0.216250917) (821 = 0.332251521) (822 = 0.255484588) (826 = 0.197225573) (827 = 0.191585274) (828 = 0.247758761) (829 = 0.246411483) (830 = 0.228379513) (831 = 0.246039143) (833 = 0.225321888) (834 = 0.260770235) (901 = 0.247062889) (904 = 0.322643723) (906 = 0.292364525) (911 = 0.152436083) (912 = 0.231389578) (914 = 0.241351406) (919 = 0.193732845) (926 = 0.311228154) (928 = 0.22456765) (929 = 0.208058124) (935 = 0.147286822) (937 = 0.215893108) (938 = 0.26001955) (940 = 0.238049713) (941 = 0.295719844) (1001 = 0.348617657) (1002 = 0.27597559) (1003 = 0.21152863) (1004 = 0.237255965) (1014 = 0.188462219) (1017 = 0.204373757) (1018 = 0.277441077) (1021 = 0.182421227) (1026 = 0.172972973) (1027 = 0.221893491) (1029 = 0.206182933) (1032 = 0.222530009) (1034 = 0.191679049) (1037 = 0.179803471) (1046 = 0.236878453) (1101 = 0.218424589) (1102 = 0.324973374) (1103 = 0.417272787) (1106 = 0.315775428) (1111 = 0.166730402) (1112 = 0.187257187) (1114 = 0.204271123) (1119 = 0.207377165) (1120 = 0.227153687) (1121 = 0.28843471) (1122 = 0.236613119) (1124 = 0.348103142) (1127 = 0.289247312) (1129 = 0.210359408) (1130 = 0.225382706) (1133 = 0.243230626) (1134 = 0.240116656) (1135 = 0.207439938) (1141 = 0.252760252) (1142 = 0.26272578) (1144 = 0.201923077) (1145 = 0.165229885) (1146 = 0.229920882) (1149 = 0.219078513) (1151 = 0.298780488) (1154 1160 = 0.215770609) (1201 = 0.399614969) (1211 = 0.22537359) (1216 = 0.234287054) (1219 = 0.220501636) (1221 = 0.29418526) (1222 = 0.215798046) (1223 = 0.213554987) (1224 = 0.221201612) (1227 = 0.236899563) (1228 = 0.22674219) (1231 = 0.244555516) (1232 = 0.24168798) (1233 = 0.27795874) (1234 = 0.237789203) (1235 = 0.275693731) (1238 = 0.253247701) (1241 = 0.225647753) (1242 = 0.211111111) (1243 = 0.288504834) (1244 = 0.227480916) (1245 = 0.196495855) (1246 = 0.255560765) (1247 = 0.274299261) (1251 = 0.196242171) (1252 = 0.242524917) (1253 = 0.19220366) (1256 = 0.26697139) (1259 = 0.176549145) (1260 = 0.185239852) (1263 = 0.239369562) (1264 = 0.186631944) (1265 = 0.218340611) (1266 = 0.176554682) (1401 = 0.2461328) (1411 = 0.215856777) (1412 = 0.196969697) (1413 = 0.195945946) (1416 = 0.206436648) (1417 = 0.218623482) (1418 = 0.310155535) (1419 = 0.405257393) (1420 = 0.363235062) (1421 = 0.260255548) (1422 = 0.267660044) (1424 = 0.205485512) (1426 = 0.262097765) (1428 = 0.21672698) (1429 = 0.253610875) (1430 = 0.258078414) (1431 = 0.262541806) (1432 = 0.351866561) (1433 = 0.234743875) (1438 = 0.183853674) (1439 = 0.218066626) (1441 = 0.181034483) (1443 = 0.274432173) (1444 = 0.238193018) (1445 = 0.293736501) (1449 = 0.241488241) (1502 = 0.355988093) (1504 = 0.333078525) (1505 1503 = 0.254770423) (1511 = 0.170327692) (1514 = 0.201468564) (1515 = 0.208056478) (1516 = 0.304499318) (1517 = 0.22291767) (1519 = 0.367485412) (1520 = 0.250878015) (1523 = 0.294086308) (1524 = 0.2172949) (1525 = 0.213089005) (1526 = 0.218404908) (1528 = 0.229696871) (1529 = 0.257520382) (1531 = 0.26006687) (1532 = 0.2634798) (1534 = 0.216958277) (1535 = 0.198542805) (1539 = 0.212571429) (1543 = 0.1670004) (1545 = 0.197929354) (1546 = 0.1875) (1547 = 0.242841609) (1548 = 0.194718626) (1551 = 0.198826119) (1554 = 0.214755141) (1557 = 0.219302437) (1560 = 0.23453909) (1563 = 0.218011068) (1566 = 0.201650231) (1567 = 0.18044659) (1571 = 0.190661479) (1573 = 0.179444444) (1576 = 0.196682464) (1601 = 0.419495208) (1702 = 0.264071215) (1703 = 0.276377575) (1612 = 0.172296338) (1613 = 0.151883354) (1617 = 0.193906532) (1620 = 0.207696228) (1621 = 0.208527493) (1622 = 0.171097478) (1627 = 0.192705639) (1630 = 0.175720015) (1632 = 0.147521161) (1633 = 0.169902913) (1634 = 0.229385574) (1635 = 0.17236534) (1636 = 0.171129578) (1638 = 0.222387268) (1640 = 0.260184796) (1644 = 0.187903699) (1648 = 0.181275284) (1653 = 0.232620532) (1657 = 0.270265696) (1662 = 0.243184768) (1663 = 0.3354531) (1664 = 0.212418301) (1665 = 0.196452933)(1624 = 0.200964034) (1718 = 0.212376934)(1711 = 0.186915888) (1714 = 0.265131401) (1717 = 0.189265537) (1719 = 0.329799391) (1721 = 0.218410805) (1724 = 0.165652784) (1725 = 0.1875) (1736 = 0.245495495) (1738 = 0.204347826) (1739 = 0.203084833) (1740 = 0.151147099) (1742 = 0.22131541) (1743 = 0.257142857) (1744 = 0.245478902) (1748 = 0.188191882) (1749 = 0.23255814) (1750 = 0.178479197) (1751 = 0.177964072) (1755 = 0.160493827) (1756 = 0.280766396) (1804 = 0.34310463) (1805 = 0.282166176) (1811 = 0.173139159) (1812 = 0.2013261) (1813 = 0.226388453) (1815 = 0.199807877) (1816 = 0.19047619) (1818 = 0.160603981) (1820 = 0.260209082) (1822 = 0.218819599) (1824 = 0.22849946) (1825 = 0.159034138) (1826 = 0.178542834) (1827 = 0.202772964) (1828 = 0.285620915) (1832 = 0.179015684) (1833 = 0.238017302) (1834 = 0.179746835) (1835 = 0.190981432) (1836 = 0.162882527) (1837 = 0.178564666) (1838 = 0.220329025) (1839 = 0.117908788) (1840 = 0.220528455) (1841 = 0.223483903) (1845 = 0.166257669) (1848 = 0.189591078) (1849 = 0.257124352) (1850 = 0.185671642) (1851 = 0.210211841) (1852 = 0.180147059) (1853 = 0.197584124) (1854 = 0.164545026) (1856 = 0.136363636) (1857 = 0.14084507) (1859 = 0.165644172) (1860 = 0.224040694) (1865 = 0.235930172) (1866 = 0.243562874) (1867 = 0.160510114) (1868 = 0.18064862) (1870 = 0.23944687) (1871 = 0.191176471) (1874 = 0.161812298) (1902 = 0.398329299) (1903 = 0.302323282) (1911 = 0.233160622) (1913 = 0.230496454) (1917 = 0.172272354) (1919 = 0.199790795) (1920 = 0.205346294) (1922 = 0.267360049)

(1923 = 0.244432662) (1924 = 0.251795977) (1925 = 0.228795438) (1926 = 0.190427699) (1927 = 0.197802198) (1928 = 0.143041237) (1929 = 0.155526992) (1931 = 0.214301052) (1933 = 0.161519199) (1936 = 0.15465995) (1938 = 0.185032895) (1939 = 0.207426376) (1940 = 0.186825054) (1941 = 0.185826123) (1942 = 0.227009322) (1943 = 0.183031459)(2002 = 0.201504567) (2003 = 0.285238841) (2004 = 0.292205481) (2011 = 0.281714043) (2012 = 0.297111504) (2014 = 0.174528302) (2015 = 0.170403587) (2017 = 0.194228635) (2018 = 0.171669794) (2019 = 0.211580481) (2020 = 0.233574442) (2021 = 0.298167188) (2022 = 0.192238267) (2023 = 0.206793207) (2024 = 0.174712644) (2025 = 0.226415094) (2027 = 0.219849246) (2028 = 0.16991342) (2030 = 0.276782536)

drop if andel_høyereutd == 2580 | andel_høyereutd == 9999
tabulate andel_høyereutd

// Centrality, kontinuerlig:

recode bosted (101 = 843) (104 = 932) (105 = 887) (106 = 884) (111 = 725) (118 = 660) (119 = 742) (121 = 667) (122 = 799) (123 = 865) (124 = 893) (125 = 853) (127 = 789) (128 = 794) (135 = 838) (136 = 890) (137 = 822) (138 = 845) (211 = 880) (213 = 914) (214 = 899) (215 = 906) (216 = 855) (217 = 929) (219 = 971) (220 = 936) (221 = 799) (226 = 869) (227 = 880) (228 = 942) (229 = 817) (230 = 976) (231 = 973) (233 = 885) (234 = 887) (235 = 909) (236 = 817) (237 = 847) (238 = 833) (239 = 730) (301 = 1000) (402 = 799) (403 = 876) (412 = 786) (415 = 792) (417 = 814) (418 = 718) (419 = 779) (420 = 698) (423 = 668) (425 = 669) (426 = 669) (427 = 762) (428 = 609) (429 = 627) (430 = 552) (432 = 491) (434 = 438) (436 = 559) (437 = 660) (438 = 584) (439 = 518) (441 = 578) (501 = 823) (502 = 803) (511 = 580) (512 = 542) (513 = 562) (514 = 572) (515 = 623) (516 = 652) (517 = 637) (519 = 620) (520 = 658) (521 = 699) (522 = 686) (528 = 731) (529 = 769) (532 = 778) (533 = 785) (534 = 784) (536 = 676) (538 = 683) (540 = 579) (541 = 587) (542 = 672) (543 = 598) (544 = 601) (545 = 522) (602 = 933) (604 = 850) (605 = 815) (612 = 800) (615 = 563) (616 = 660) (617 = 697) (618 = 629) (619 = 662) (620 = 640) (621 = 662) (622 = 622) (623 = 812) (624 = 856) (625 = 897) (626 = 896) (627 = 883) (628 = 810) (631 = 703) (632 = 588) (633 = 537) (701 = 889) (704 = 891) (710 = 870) (711 = 761) (712 = 850) (713 = 851) (715 = 842) (716 = 821) (729 = 843) (805 = 860) (806 = 846) (807 = 762) (811 = 666) (814 = 775) (815 = 741) (817 = 633) (819 = 713) (821 = 747) (822 = 709) (826 = 599) (827 = 589) (828 = 638) (829 = 608) (830 = 538) (831 = 466) (833 = 544) (834 = 553) (901 = 704) (904 = 812) (906 = 803) (911 = 661) (912 = 583) (914 = 711) (919 = 701) (926 = 787) (928 = 711) (929 = 574) (935 = 634) (937 = 691) (938 = 564) (940 = 485) (941 = 472) (1001 = 857) (1002 = 783) (1003 = 695) (1004 = 690) (1014 = 765) (1017 = 764) (1018 = 785) (1021 = 647) (1026 = 549) (1027 = 613) (1029 = 686) (1032 = 713) (1034 = 600) (1037 = 657) (1046 = 602) (1101 = 753) (1102 = 887) (1103 = 908) (1106 = 831) (1111 = 664) (1112 = 637) (1114 = 697) (1119 = 786) (1120 = 854) (1121 = 843) (1122 = 807) (1124 = 872) (1127 = 877) (1129 = 651) (1130 = 722) (1133 = 540) (1134 = 528) (1135 = 632) (1141 = 632) (1142 = 730) (1144 = 507) (1145 = 626) (1146 = 723) (1149 = 764) (1151 = 315) (1160 1154 = 658) (1201 = 902) (1211 = 613) (1216 = 679) (1219 = 645) (1221 = 734) (1222 = 593) (1223 = 572) (1224 = 593) (1227 = 484) (1228 = 659) (1231 = 532) (1232 = 547) (1233 = 552) (1234 = 591) (1235 = 737) (1238 = 677) (1241 = 618) (1242 = 690) (1243 = 788) (1244 = 595) (1245 = 694) (1246 = 814) (1247 = 814) (1251 = 650) (1252 = 527) (1253 = 712) (1256 = 768) (1259 = 695) (1260 = 677) (1263 = 742) (1264 = 660) (1265 = 431) (1266 = 544) (1401 = 706) (1411 = 478) (1412 = 368) (1413 = 505) (1416 = 565) (1417 = 536) (1418 = 547) (1419 = 617) (1420 = 695) (1421 = 543) (1422 = 563) (1424 = 606) (1426 = 582) (1428 = 524) (1429 = 584) (1430 = 608) (1431 = 576) (1432 = 752) (1433 = 625) (1438 = 491) (1439 = 632) (1441 = 522) (1443 = 640) (1444 = 611) (1445 = 637) (1449 = 616) (1502 = 774) (1504 = 827) (1505 1503 = 766) (1511 = 551) (1514 = 572) (1515 = 679) (1516 = 732) (1517 = 698) (1519 = 727) (1520 = 725) (1523 = 700) (1524 = 546) (1525 = 629) (1526 = 620) (1528 = 692) (1529 = 722) (1531 = 743) (1532 = 720) (1534 = 653) (1535 = 653) (1539 = 629) (1543 = 557) (1545 = 573) (1546 = 466) (1547 = 623) (1548 = 666) (1551 = 638) (1554 = 632) (1557 = 595) (1560 = 584) (1563 = 645) (1566 = 615) (1567 = 603) (1571 = 510) (1573 = 465) (1576 = 513) (1804 = 801) (1805 = 711) (1811 = 429) (1812 = 510) (1813 = 621) (1815 = 413) (1816 = 381) (1818 = 490) (1820 = 668) (1822 = 568) (1824 = 704) (1825 = 496) (1826 = 456) (1827 = 430) (1828 = 520) (1832 = 575) (1833 = 714) (1834 = 368) (1835 = 350) (1836 = 355) (1837 = 495) (1838 = 485) (1839 = 454) (1840 = 606) (1841 = 681) (1845 = 563) (1848 = 427) (1849 = 437) (1850 = 423) (1851 = 559) (1852 = 510) (1853 = 545) (1854 = 523) (1856 = 387) (1857 = 404) (1859 = 477) (1860 = 637) (1865 = 644) (1866 = 601) (1867 = 534) (1868 = 568) (1870 = 683) (1871 = 536) (1874 = 462) (1902 = 808) (1903 = 744) (1911 = 593) (1913 = 566) (1917 = 453) (1919 = 501) (1920 = 516) (1922 = 600) (1923 = 572) (1924 = 602) (1925 = 621) (1926 = 505) (1927 = 514) (1928 = 426) (1929 = 453) (1931 = 645) (1933 = 571) (1936 = 448) (1938 = 481) (1939 = 523) (1940 = 446) (1941 = 570) (1942 = 581) (1943 = 444) (2002 = 529) (2003 = 643) (2004 = 700) (2011 = 494) (2012 = 721) (2014 = 377) (2015 = 368) (2017 = 468) (2018 = 415) (2019 = 535) (2020 = 567) (2021 = 573) (2022 = 440) (2023 = 413) (2024 = 441) (2025 = 501) (2027 = 483) (2028 = 552) (2030 = 640) (1601 =

898) (1702 = 736) (1703 = 723) (1612 = 638) (1613 = 559) (1617 = 562) (1620 = 559) (1621 = 646) (1622 = 587) (1627 = 591) (1630 = 546) (1632 = 433) (1633 = 462) (1634 = 668) (1635 = 606) (1636 = 641) (1638 = 779) (1640 = 669) (1644 = 532) (1648 = 662) (1653 = 778) (1657 = 745) (1662 = 793) (1663 = 813) (1664 = 663) (1665 = 504) (1711 = 629) (1714 = 799) (1717 = 649) (1719 = 762) (1721 = 750) (1724 = 585) (1725 = 575) (1736 = 546) (1738= 422) (1739 = 419) (1740 = 436) (1742 = 581) (1743 = 541) (1744 = 638) (1748 = 486) (1749 = 478) (1750 = 612) (1751 = 547) (1755 = 406) (1756 = 676) (5054 = 629)

drop if bosted == 2580 | bosted == 9999

///////// Dependent variable

// 0 = Utdanning på ulikt presitisje nivå enn mor og far
// 1 = helt lik utdanning som far
// 2 = helt lik utdanning som mor

generate elite = 0
replace elite = 1 if utdfelt == utdfar
replace elite = 2 if utdfelt == utdmor

/// MLOGIT

// For alle (uten if-betingelse)
mlogit elite i.mann#c.timelønnmor_gj10 i.mann#c.timelønnfar_gj10 i.mann#c.gjarbtimer_mor_uke i.mann#c.gjarbtimer_far_uke c.bosted c.andel_høyereutd, mfx(dydx)

//Høy prestisje
mlogit elite i.mann#c.timelønnmor_gj10 i.mann#c.timelønnfar_gj10 i.mann#c.gjarbtimer_mor_uke i.mann#c.gjarbtimer_far_uke c.bosted c.andel_høyereutd if utdfelt == 1 | utdfelt == 2 | utdfelt == 3, mfx(dydx)

//Middels prestisje
mlogit elite i.mann#c.timelønnmor_gj10 i.mann#c.timelønnfar_gj10 i.mann#c.gjarbtimer_mor_uke i.mann#c.gjarbtimer_far_uke c.bosted c.andel_høyereutd if utdfelt == 11 | utdfelt == 12 | utdfelt == 13, mfx(dydx)

//Lav prestisje
mlogit elite i.mann#c.timelønnmor_gj10 i.mann#c.timelønnfar_gj10 i.mann#c.gjarbtimer_mor_uke i.mann#c.gjarbtimer_far_uke c.bosted c.andel_høyereutd if utdfelt == 21 | utdfelt == 22 | utdfelt == 23 | utdfelt == 26 , mfx(dydx)