ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Bachelor Thesis Economics and Business Economics

Horizontal differentiation in postsecondary education in the Netherlands: the effect of gender and labor market opportunities

Name student

Sarah Tummers

Student ID number

482549

Supervisor

Dr. A.L. Boring

Second assessor

Dr. S.V. Kapoor

Abstract

Women make up for less than 20 percent of the number of CEO's in the Netherlands (Grant Thornton, 2019). The glass ceiling that keeps women from rising to these top positions can be caused by the lack of qualified women. This paper argues that the horizontal gender-differentiation in postsecondary education could be a cause of this pipeline problem. Using data from the Student monitor survey, this paper examines whether gender differences in study choices still exist in the Netherlands. In addition, the effect of the extent to which students have taken their expected labor market opportunities into account on study choices, is tested in this paper, along with the interaction effect between this variable and gender. The results show that the probability of a student choosing a university study program in Economics is lower for female bachelor and master students. This probability significantly increases with the extent to which students have taken their expected labor market opportunities into account when making their study choice. This effect seems to be higher for female bachelor students.

Date final version

August 6, 2020

The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

Table of contents

1. Introduction

Every year, Management Scope draws up a list of the top 100 most influential corporate women in the Netherlands. Annet Aris was number one last year (Management Scope, 2019). She is a member of the supervisory board of Rabobank, ASML and Randstad. Unfortunately, top positions are not commonly held by women. Only 28 percent of the people in management functions and only 15 percent of the CEO's or managing directors is female in the Netherlands (Grant Thornton, 2019). Even though the number of women in senior positions increased over time, this number is still very low compared to the number of male leaders.

The barrier that keeps women from rising to these top positions is also referred to as the glass ceiling (Federal Glass Ceiling Commission, 1995). Whereas some researchers argue that this barrier is caused by prejudice against female leaders (Eagly & Karau, 2002), others argue that there is a lack of women qualified enough to fulfill top positions successfully, also referred to as the pipeline problem. Previous research showed that women's family responsibilities (Greenhaus & Parasuraman, in Eagly & Karau, 2002) and the biological/natural sex differences (e.g. Browne, 1999; Goldberg, 1993) could underlie this pipeline problem.

When we look at the academic achievement of the top 10 most influential corporate women of 2019 in the Netherlands by Management Scope (2019), we can see that 50 percent followed a business/economic oriented major. A lack of women that choose this field in higher education could, therefore, be a cause of the pipeline problem. For this to be a compelling case, it must be true that having completed a business or economic oriented major increases the chances that someone ends up in a top position and gender-differentiation in study choices must exist. The first is debatable since there is an ongoing discussion among management scholars whether management research is practical relevant (Kieser, Nicolai & Seidl, 2015). However, previous research showed that gender differences in study choices do exist and that these differences are mostly patterned along a humanistic–scientific divide (e.g. Bradley, 2000; Barone, 2011). This means that women are more likely to major in humanities, social sciences and education whereas male students tend to major in STEM-fields (science, technology, engineering, and mathematics). Kalmijn and Van der Lippe (1997) confirm this but show that men dominate in economics and administration fields as well besides the STEM-fields in the Netherlands. This horizontal gender-differentiation in postsecondary education contributes to the gender gap in earnings of college graduates for the Netherlands since male-dominated fields generally have higher rates of return than female-dominated fields (Kalmijn & Van der Lippe, 1997). It is unclear however if these gender differences in study choices stay the same (Barone, 2011) or if they converge over time (Gerber & Cheung, 2008). This paper examines if this horizontal gender-differentiation in university still exists in the Netherlands.

Many researchers tried to find the possible causes of the horizontal gender-differentiation in postsecondary education (Gerber & Cheung, 2008). Gender differences in career expectations that develop early in life could shape gender differences in study choices for instance. Daymont and Andrisani (1984) and Kalmijn and Van der Lippe (1997) argue for example that women may rationally avoid entering into technical and economic-administrative fields since their returns are lower in these disciplines: the 'chilling effect'. Assuming this is true, students' expectations of their chances on the future labor market could, therefore, shape their study choice. The latter effect, which is related to but not same as the chilling effect, is measured in this paper using data from the Student monitor survey (ResearchNed, 2019a, 2019b, 2019c). To conclude, this paper will test empirically if horizontal gender-differentiation in university still exists in the Netherlands and if students' labor market expectations affect their study choice and women's aversion to studying in the Economics sector. The research question concerns:

What is the effect of gender and students' labor market expectations on the probability of a student choosing a business or economic oriented university study program in the Netherlands?

By examining this question, this paper contributes to the ongoing research on horizontal gender-differentiation in postsecondary education by showing that this gender-differentiation still exists among university students in the Netherlands. Besides, this paper contributes to research on the pipeline problem by suggesting that gender differences in study choices could be another cause for the lack of qualified women available for top positions. This paper clarifies that besides gender, Dutch master students' expected labor market opportunities and the extent to which Dutch bachelor and master students take these opportunities into account positively affect the probability of this student studying in Economics. The latter effect seems to be stronger for female university students. Several suggestions for policy to reduce horizontal gender-differentiation in postsecondary education are given based on these findings. That is what makes this paper socially relevant.

2. Theoretical framework

2.1 Glass ceiling and the pipeline problem

As mentioned in the introduction, there exists a minority of women in top positions. In this paper, the concept of 'top positions' refers to major leadership posts (e.g. elite leaders and top executives) since women have already gained increased access to supervisory and middle management positions over the last few decades (Eagly & Karau, 2002). This pattern of the rarity of women in high executive positions despite the presence of (near) equality in 'middle' positions, can be found when a number of US statistics are analyzed; even though 44.1% of managerial occupations are fulfilled by women in the

US (U.S. Bureau of Labor Statistics, 2020), only 7.4% of the Fortune 500 companies are run by women (Hinchliffe, 2020). The Women in Business report of 2019 (Grant Thornton, 2019) also shows a rise in the number of women in leadership positions in the Netherlands as 83 percent of Dutch companies have at least one woman in a leadership position in 2019, which is lot higher compared to the 56% in 2018. However, this reports also shows that women make up for only 17% of the number of CEO's in the Netherlands. Many researchers refer to this phenomenon as the existence of a glass ceiling for women in business which is "the unseen, yet unbreachable barrier that keeps (...) women from rising to the upper rungs of the corporate ladder, regardless of their qualifications or achievements" (Federal Glass Ceiling Commission, 1995).

Many researchers have tried to explain the causes of the glass ceiling for women. Researchers traditionally focused on the problem of a lack of qualified women (the pipeline problem) as the main cause of the rarity of women in top positions. Various causes are ascribed to the pipeline problem such as women's family responsibilities (Greenhaus & Parasuraman, in Eagly & Karau, 2002) or the biological/natural sex differences in traits and motivations that are needed to succeed as a leader (e.g. Goldberg, in Eagly & Karau, 2002). Besides, Ibarra, Ely and Kolb (2013) argue that the subtle gender bias in leadership roles that persists in organizations and in society could affect the willingness of women to become leaders which could be another cause of the pipeline problem. This is in line with the theory of prejudice against female leaders proposed by Eagly and Karau (2002) which is based on an analysis of the descriptive and injunctive aspects of gender roles. They argue that as successful leaders are expected to have agentic qualities while perceives *expect* (descriptive aspect) and *prefer* (injunctive aspect) women to have communal qualities, inconsistency may arise between the gender role and the leadership role. This may result in less positive attitudes towards (potential) female leaders and can, therefore, be the reason that it is more difficult for women to become successful leaders.

2.2 Horizontal gender-differentiation in postsecondary education

However, the concept of the pipeline problem focuses on the lack of 'qualified' women. People may argue that there are simply not enough women who are qualified enough to take leadership positions. When we look at the number of women participating in postsecondary education in general, there is no compelling case that education could be the cause of the pipeline problem as this number is as high as men (Bradley, 2000) and in some cases even higher. There exists, however, a clear division of men and women with respect to their choice of fields of study. A well-established finding in this field of research on horizontal differentiation in postsecondary education is that these gender differences are patterned along a humanistic–scientific divide (e.g. Bradley, 2000; Barone, 2011). Female students major less often in STEM-fields (science, technology, engineering, and mathematics) than male

students and major more often in humanities, social sciences and education. Bradley (2000) showed that this was true for a large-scale of European countries and DiPrete and Buchmann (2013) for the United States. Barone (2011) confirmed this for Europe and provided new evidence in favor of the presence of this pattern in the Netherlands.

If we consider business and economics as social sciences, these findings would imply that women dominate in these majors as well. Even when these majors are considered effective, gender differences in study choices could therefore not be a cause for the pipeline-problem since women would dominate in these fields. However, when 'business and economics' is considered as a separate field of study rather than part of the study field 'social sciences', the opposite can be found. Kalmijn and Van der Lippe (1997) show that in the Netherlands, men dominate in economics and administration fields besides the STEM-fields and that women dominate in socio-cultural and caring fields. Gerber and Cheung (2008) also point out that women are overrepresented in the biological sciences and social sciences with the exception of economics. Wiswall and Zafar's (2018) findings confirm this pattern for NYU undergraduate students as well. This effect of gender on study choice is stronger in the rural region compared to the urban region in India (Chakrabarti, 2009). Besides, other factors influence study choice as well such as economic background (Chakrabarti, 2009).

What causes this horizontal gender-differentiation in postsecondary education? Gerber and Cheung (2008) point out the most recognized possible causes like gender differences in mathematical ability. Gender differences in career expectations which develop early in life is also one of them. This cause refers to the gender stereotypes that shape the course of education followed by young men and women. Women are expected to pursue a career that allows them to express their social and altruistic skills for example. Gabay-Egozi, Shavit and Yaish (2015) argue that these gender roles are conveyed on children by their significant others during childhood and adolescence. Gerber and Cheung (2008) refer to gender differences in career expectations during adolescence as well. By referring to other studies, they explain that students choose the field of study that matches with their future desired job which eventually will maximize their future discounted lifetime earnings. Wiswall and Zafar (2018) also found that job attributes have a sizable impact on major choice; women's major choice is affected more by changes in nonpecuniary job attributes like work flexibility and job stability whereas men prefer majors that lead to jobs with higher earnings growth. In addition, Daymont and Andrisani (1984) and Kalmijn and Van der Lippe (1997) argue that women may rationally avoid entering into technical and economic-administrative fields in which they earn lower returns than men: the 'chilling effect'. If this is true, women who take their chances on the labor market into account when picking a major could rationally avoid these male predominated study sectors. This can be linked to the article of Ibarra et al. (2013) which claim that women avoid becoming leaders due to subtle gender bias in leadership roles that

persists in organizations and in society. Gerber and Cheung (2008) conclude however with the statement that "collectively researchers simply do not understand why these differences in [study] preferences emerge so early in life".

2.3 Horizontal gender-differentiation and the gender gap in earnings

Horizontal gender-differentiation in postsecondary education is receiving increasing attention in sociological research as these differences may translate into gender inequality on the labor market. Gender differences in study choice contribute to the gender gap in earnings of college graduates for the Netherlands (Kalmijn & Van der Lippe, 1997), Russia (Gerber & Schaefer, 2004) and the United States (Jacobs 1996) for example. Kalmijn and Van der Lippe (1997) found that technical and economic-administrative fields generally have higher rates of return than socio-cultural and caring fields in the Netherlands. They found evidence that this horizontal gender-differentiation in postsecondary education contributes partly (10%) to the gender gap in earnings since men are overrepresented in the better paying majors and women in the less lucrative majors. They also show that men earn higher returns in male-dominated fields than women and vice versa but found a much weaker effect. These findings are consistent with an analysis of American data by Daymont and Andrisani (1984). These two effects decreased over time (but remained sizable) partly due to the convergence in the gender-specific distributions across majors (Gerber & Cheung, 2008).

If gender segregation in study choices affects the income gap between men and women, one may wonder whether this segregation could be a cause for the glass ceiling for women as well. For this to be a compelling case we must consider two separate possible effects: the effect of gender on postsecondary education choices and the effectiveness of higher education in developing successful leaders. As mentioned above, Kalmijn and Van der Lippe found in 1997 that men were most likely to follow an economic, business or technical major whereas women tended to choose a humanity, social or biological/health major. Where Gerber and Cheung (2008) point out in their literature review that the share of women in 'male majors' like business increased over the past years, Barone (2011) found that the horizontal gender-differentiation in higher education remained almost the same from 1965 to 1994 in the Netherlands. However, the dataset that Barone (2011) used was limited in a way that it merged various study fields together which ideally should be separated. Social sciences, economics and law were taken together for example. Because of this contradiction between Gerber and Cheung (2008) and Barone (2011), it is important to first determine whether men are still overrepresented in the economics and business sector before examining the second effect.

The second effect refers to the effectiveness of higher education in developing successful leaders. Business school and business-related majors are often expected to educate their students on leadership. Although these types of majors have been commercial successes as more and more

students chose a business major (Pfeffer & Fong, 2002), researchers have been critical towards the relationship between management theory/scholarship and managerial practice. The ongoing theory-practice debate finds its origins in the early days of "business school" (Augier & March, 2011, p. 215). The report by Gordon and Howell (1959) argued for example that business education must be scientific besides practical as well. Later, researchers found that business schools failed to achieve this. Pfeffer and Fong (2002) found for example that "neither possessing an MBA [Master of Business Administration] degree nor grades earned in courses correlate with career success".

The number of articles that offer solutions to the theory-practice gap increased considerably since 2000 (Bartunek & Rynes, 2014). Kieser, Nicolai and Seidl (2015) provide a systematic literature review of studies on the subject of practical relevance of management research (the relevance literature). They identify two main bodies of contributions to the relevance literature: the programmatic relevance literature and the descriptive relevance literature. The first comprises contributions that focus "on the development of suggestions for dealing with the issue of relevance in management research". The descriptive relevance literature has received little attention in the programmatic relevance literature but has generated many important insights as well according to Kieser et al. (2015). This body of literature consists of contributions that focus on "the description or assessment of the interplay between management research and its external stakeholders". Besides the many interesting insights, Kieser et al. (2015) argue that both bodies of relevance literature are fragmented and lack scientific rigor. In order to promote relevance literature, they suggest a more rigorous and systematic research program that investigates how management practitioners utilize the findings of management research.

To conclude, the practical relevance of management research, and therefore partly the effectiveness of business schools as well, is an ongoing discussion among management scholars. Therefore, before any conclusions can be made about the effect of horizontal gender-differentiation in university on the glass ceiling (through the pipeline problem), the effectiveness of management education in developing successful leaders needs to be investigated further.

In Figure 1 the separation of the three effects that are mentioned above are clarified. Effect (3) refers to the effect of the lack of qualified women on the rarity of women in top positions in general. The second effect (2) displays the possible effect of major choices, the choice for business and economics majors in particular, on the (low) number of qualified women. Lastly, the first effect refers to the gender differences in study choices made by students. If the previous mentioned gender distribution in majors still exists to this day and economics/business majors are found to be effective in developing successful future leaders, horizontal gender-differentiation in postsecondary education could possibly be one of the causes for the pipeline problem.

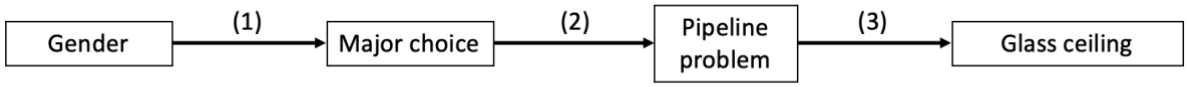

Figure 1.

Diagram of various variables and their possible effects on the number of women in top positions

This paper focuses on the first effect and investigates whether gender distribution in study programs still exists at universities in the Netherlands. The following hypotheses are tested:

Hypothesis 1a: Gender differentiation in study choices exist in the Netherlands with the probability of a student choosing a business or economic oriented university study program being higher for male students compared to female students.

Hypothesis 1b: Gender differentiation in study choices exist in the Netherlands with the probability of a student choosing a humanities and social oriented university study program being higher for female students compared to male students.

This paper strives to contribute to previous research on gender segregation in study choices as well by empirically testing the following hypothesis which is related to (but not the same as) the possible "chilling effect".

Hypothesis 2: The probability of a female-student choosing a business or economic oriented university study program is even lower for women who take their chances on the labor market into account when choosing their study field.

The focus is on business and economic oriented study programs since previous research showed that labor returns are lower for women in these male-dominated fields compared to men (Kalmijn & Van der Lippe, 1997) which could translate in low expectations of women's chances on the labor market in this sector. In addition, by focusing on these study fields, this paper tries to encourage future research to examine whether the lack of women in these study fields, whether or not this is caused by women's labor market expectations, could be a cause of the glass ceiling.

3. Data

3.1 Description

This paper uses two different sources of data: *Dienst Uitvoering Onderwijs* (DUO, Education Executive Agency) and ResearchNed.

3.1.1 DUO

The first source is used to gain information on the situation in the Netherlands regarding the study choices of male and female students per sector. For this analysis, datasets are used from DUO on university enrolled students (Dienst Uitvoering Onderwijs, 2020a) and university graduates (Dienst Uitvoering Onderwijs, 2020b) from respectively the academic years 2015-2019 and 2014-2019. These datasets show the number of male and female students per province, municipality, institution, CROHO (sub) component, study and program form (bachelor or master). It is important to note that this dataset only counts the number of the *primary* enrollments of students (Dienst Uitvoering Onderwijs, n.d.). It is therefore possible that there are more enrolled students per study program than is shown in this dataset.

This paper mainly uses the information of the CROHO components, the gender of the students and the education form. The Inspection of Education of the Netherlands uses CROHO components to group all higher education programs of the Netherlands in terms of content. There exist ten different CROHO components: Economics, Healthcare, Behaviour & Society, Agriculture & Natural Environment, Nature, Education, Language & Culture, Law, Science and Cross-Sectoral. Throughout this paper, differences in these components will be used to differentiate between choices in study programs made by students. However, the focus in this paper is mainly on the CROHO components Economics and Science on the one hand and Healthcare and Behaviour & Society on the other since previous studies showed that the horizontal gender-differentiation is the largest in these study sectors.

3.1.2. Student monitor

Secondly, data from ResearchNed is used to determine the effect of gender on study choices. Every year, ResearchNed conducts the Student Monitor Higher Education survey among students on behalf of the Ministry of Education, Culture and Science. DUO and ResearchNed select a sample of students and these students are contacted to participate. The number of questions varies per year but is around 160 questions. The questions are grouped by main themes like study program and process, before and after their study program, income and expenses, background characteristics, etcetera.

This paper uses repeated cross-sectional data from the Student monitor from the academic years 2015-2017 (ResearchNed, 2019a, 2019b, 2019c). The net response after cleaning is respectively 13%

(*N* = 15,681), 13% (*N* = 15,903) and 10% (*N* = 18,698). Since DUO draws a stratified sample each year, some groups may be over- or underrepresented, which results in an unjustified proportional distribution of the CROHO components and study years in the population. To correct these deviations, each observation is linked to a weighting factor based on program form, study sector, study year and gender. This paper focuses on bachelor and master university (wo) students. Therefore, students that are enrolled in higher professional education (hbo) are excluded from the subsample.

In addition, the survey asks students about their current situation and not specifically about their situation prior to their enrolment in scientific education. Since this study is interested in factors that could affect the students' prior choice in study programs, a subsample is drawn from the dataset that only consists of students who completed the questionnaire in the same academic year as in which they started their study. For example, a student is included in the subsample if she started her study in the Netherlands in the academic year 2016-2017 and filled in the survey in 2017. In this way, differences are limited between the values of several background variables prior to students' study enrollment and the values of these variables during their studies.

Only the students' answers to the questions about gender, migration background, study choice, study form, labor market expectations of the students (as a motive for their study choice) and their parental background (financial situation and social class) are used in the analyses of this paper. However, this paper focuses on the labor market expectations of students in general and as a motive for their study choice besides their gender and study choice. The questions regarding the students' labor market expectations and motives are the following:

I. How do you assess your chances on the (Dutch/European) labor market after obtaining your diploma from your current education program?
II. Have you taken your job opportunities into account in your choice of study?
III. What are the main motives for you to follow this master's program?
    - This master offers me good opportunities on the labor market

Since this paper focuses on Dutch students and the Dutch labor market only, the question regarding the European labor market is excluded. Besides, question I. and II. were asked to both bachelor and master students whereas question III. was only asked to master students. The answers to the questions I. till III. are used to test the effect of students' labor market expectations (as a motive for their study choice) on the probability that a student choses to study in the sector Economics. All the questions, their answer options and variable names can be found in Appendix A (Table A1). The subsample that is used in this paper now consists of 8404 observations.

3.2 Descriptive statistics

3.2.1 DUO

One way to observe the gender differences in study choices in the Netherlands is by looking at the tables and figures created from the DUO data on enrolled and graduated university bachelor and master students. Tables 1 to 4 show the number of students per sector for the most recent academic year available in the data set. A distinction has been made between bachelor and master students and between graduates and enrolled students which results in four different categories of students. These tables show that most bachelor and master graduates followed, and most enrolled master students follow a study in the CROHO study sectors Behaviour & Society, Science, Healthcare and Economics. This is roughly the same for enrolled bachelor students however is the sector Language & Culture part of the big four in this category of students instead of the sector Healthcare. When study choice is sorted by gender, the tables show that most male students of all four categories study or studied in the sectors Economics and Science. The top two study sectors in which female students follow or followed an education program are not the same for all categories. The percentage of female students is the highest in the study sector Behaviour & Society for all the four categories. However, the second highest percentage of women can be found in the CROHO component Healthcare for enrolled master students and bachelor graduates but can be found in the CROHO component Language & Culture and Economics for enrolled bachelor students and master graduates respectively.

Table 1.

Number of male and female enrolled bachelor students DUO data by study sector in 2019

Study sector	Gender				Total	
	Male		Female			
	Number of observations	Percentage of students	Number of observations	Percentage of students	Number of observations	Percentage of students
Economics	20489	21.99	10968	10.65	31457	16.04
Behaviour and Society	11860	12.73	27908	27.11	39768	20.28
Healthcare	5752	6.17	13153	12.78	18905	9.64
Agriculture and natural environment	2679	2.88	3108	3.02	5787	2.95
Nature	12562	13.48	7892	7.67	20454	10.43
Education	10	0.01	49	0.05	59	0.03
Law	7980	8.57	12369	12.02	20349	10.38
Cross-sectoral	4513	4.84	7358	7.15	11871	6.05

Table 1 continued.

Language & Culture	8491	9.11	13506	13.12	21997	11.22
Science	18831	20.21	6633	6.44	25464	12.98
Total	93167	100.00	102944	100.00	196111	100.00

Table 2.

Number of male and female enrolled master students DUO data by study sector in 2019

Study sector	Gender				Total	
	Male		Female			
	Number of observations	Percentage of students	Number of observations	Percentage of students	Number of observations	Percentage of students
Economics	9558	18.09	6215	10.75	15773	14.25
Behaviour & Society	4756	9.00	11897	20.57	16653	15.05
Healthcare	5014	9.49	11351	19.63	16365	14.79
Agriculture & natural environment	2637	4.99	3628	6.27	6265	5.66
Nature	8015	15.17	5469	9.46	13484	12.19
Education						
Law	4149	7.85	6801	11.76	10950	9.90
Cross-sectoral	305	0.58	284	0.49	589	0.53
Language & Culture	3943	7.46	6744	11.66	10687	9.66
Science	14450	27.35	5440	9.41	19890	17.97
Total	52827	100.00	57829	100.00	110656	100.00

Table 3.

Number of male and female bachelor graduates DUO data by study sector in 2018

Study sector	Gender				Total	
	Male		Female			
	Number of observations	Percentage of students	Number of observations	Percentage of students	Number of observations	Percentage of students
Economics	3552	21.67	2077	10.40	5629	15.48
Behaviour and Society	2016	12.30	5205	26.05	7221	19.85

Table 3 continued.

Healthcare	1292	7.88	3207	16.05	4499	12.37
Agriculture and natural environment	537	3.28	701	3.51	1238	3.40
Nature	2054	12.53	1408	7.05	3462	9.52
Education						
Law	1380	8.42	2259	11.31	3639	10.01
Cross-sectoral	948	5.78	1537	7.69	2485	6.83
Language & Culture	1449	8.84	2380	11.91	3829	10.53
Science	3164	19.30	1203	6.02	4367	12.01
Total	16392	100	19977	100	36369	100

Table 4.

Number of male and female master graduates DUO data by study sector in 2018

Study sector	Gender				Total	
	Male		Female			
	Number of observations	Percentage of students	Number of observations	Percentage of students	Number of observations	Percentage of students
Economics	5308	26.25	3847	15.45	9155	20.29
Behaviour & Society	2524	12.48	6712	26.95	9236	20.47
Healthcare	1616	7.99	3642	14.63	5258	11.65
Agriculture & natural environment	819	4.05	1185	4.76	2004	4.44
Nature	2329	11.52	1613	6.48	3942	8.74
Education						
Law	1779	8.80	3105	12.47	4884	10.82
Cross-sectoral	70	0.35	96	0.39	166	0.37
Language & Culture	1633	8.07	3058	12.28	4691	10.40
Science	4146	20.50	1644	6.60	5790	12.83
Total	20224	100.00	24902	100.00	45126	100.00

This paper focusses on the study sectors Economics, Science, Behaviour & Society and Healthcare as literature showed that the greatest gender segregation exists in these sectors. In addition, the previous tables show that most students follow or followed a study program in these sectors. Figure 2 shows the percentage of enrolled bachelor (BA, left) and master (MA, right) students and graduates per sector and per gender. Since gender differences do not vary much by year, the figures only show the data from one year. For both enrolled students and graduates, the last available data is used which means that the data from 2019 has been used for enrolled students and the data from 2018 for the graduates.

It can be noted from these graphs that gender differences still exist in the number of enrolled students and graduates per sector. What stands out is that the ratio is mainly around 30% to 70% and 40% to 60%. Male students dominate in the sectors Economics and Science and female students dominate in the sectors Behaviour & Society and Healthcare. This is in line with Hypotheses 1a and 1b and with previous research. In addition, gender differences are approximately the same for bachelor and master students and for graduates and enrolled students.

3.2.2. Student monitor

Student monitor data is used for the statistical analyses. Table 5 to 8 show summary statistics of the main variables used in this paper. In Appendix B, the tables with the descriptive statistics of the control variables can be found. Table 5 shows that most students are enrolled in education programs that belong to the CROHO components Behaviour & Society, Science, Healthcare and Nature. When study choice is sorted by gender, roughly the same patterns of gender differences can be seen as in the analysis of the DUO data. Most male students follow a study in the sectors Economics and Science, whereas most female students chose a study program in the sectors Behaviour & Society and Healthcare. Besides, Table 5 shows that women are overrepresented in this sample compared to male students. It is therefore important to focus on the percentages in the tables rather than on the absolute number of observations and to weigh each observation in the statistical analyses. In addition, more than half of the participants (67.15%, Table 6) expect their opportunities on the labor market to be good or very good after completing their education. This percentage is even greater for male students (74.74%) but smaller for female students (62.81%) where the biggest difference lies in the lower number of female students who expect their opportunities on the labor market to be very good. Also, when students had to make their study choice, most students took the opportunities on the labor market of their study (slightly/much) into account (73.07%, Table 7) and most master students found this an important choice motive for their masters (65.66 %, Table 8). This is again somewhat smaller for female students (resp. 71.08% and 63.80%) but somewhat greater for men (resp. 76.90% and 68.67%).

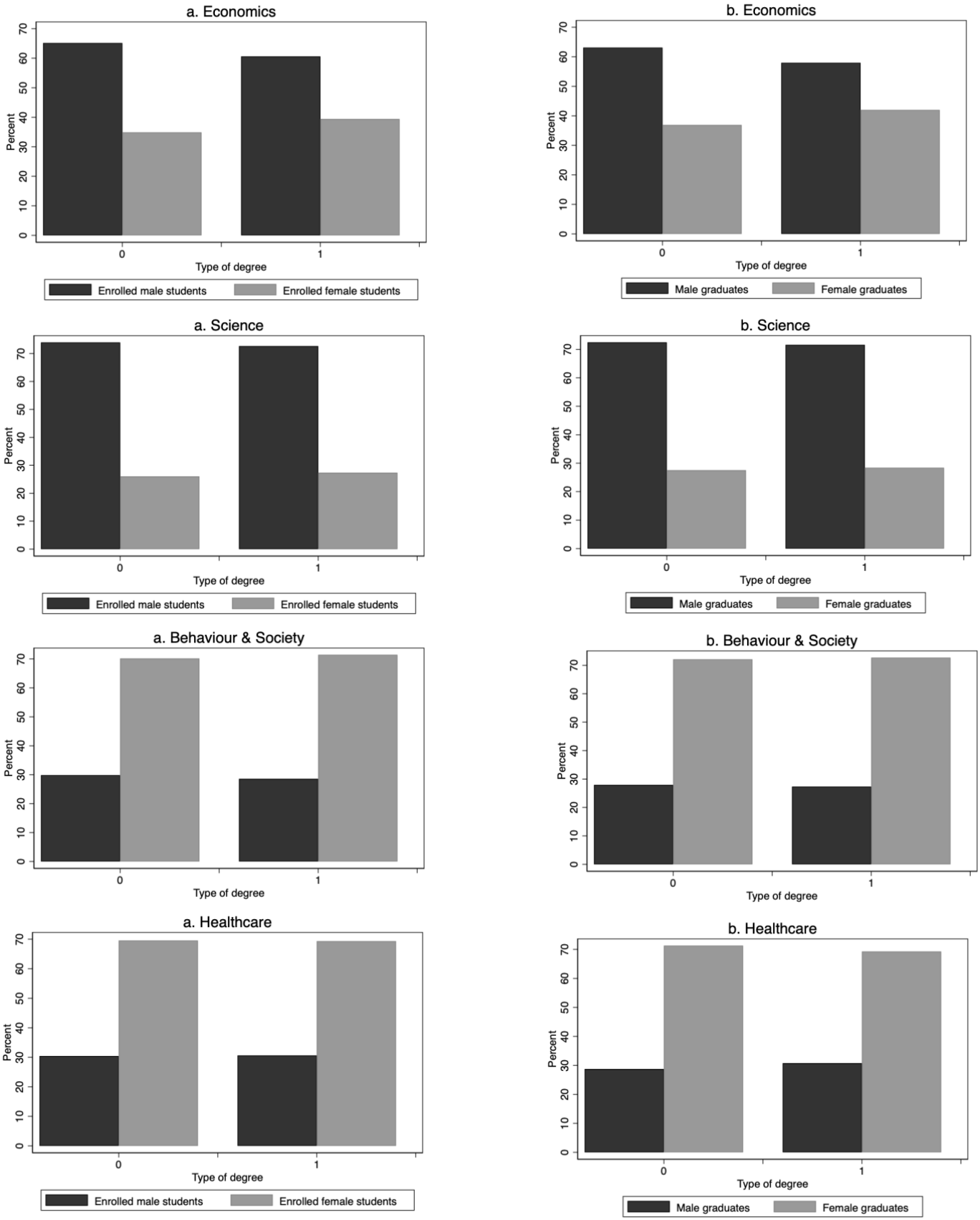

Figure 2.
Number of enrolled bachelor and master students and graduates per sector and gender.
Source: DUO, 2020
Note. Here '0' stands for Bachelor students and '1' for Master students

Table 5.
Number of male and female students in the Student monitor subsample by study sector

Study sector	Gender				Total	
	Male		Female			
	Number of observations	Percentage of respondents	Number of observations	Percentage of respondents	Number of observations	Percentage of respondents
Economics	486	15.92	431	8.05	917	10.91
Behaviour & Society	320	10.48	1221	22.82	1541	18.34
Healthcare	216	7.08	936	17.49	1152	13.71
Agriculture & natural environment	126	4.13	298	5.57	424	5.05
Nature	484	15.85	565	10.56	1049	12.48
Education	10	0.33	33	0.62	43	0.51
Law	190	6.22	455	8.50	645	7.67
Cross-sectoral	88	2.88	215	4.02	303	3.61
Language & Culture	234	7.66	721	13.47	955	11.36
Science	899	29.45	476	8.90	1375	16.36
Total	3053	100.00	5351		8404	100.00

Table 6.
Number of male and female students in the Student monitor subsample according to their expectations of their opportunities on the labor market

Labor market opportunities	Gender				Total	
	Male		Female			
	Number of observations	Percentage of respondents	Number of observations	Percentage of respondents	Number of observations	Percentage of respondents
1 Very bad	37	1.21	87	1.63	124	1.48
2	154	5.04	373	6.97	527	6.27
3	397	13.00	1064	19.88	1461	17.38
4	1384	45.33	2507	46.85	3891	46.30
5 Very good	898	29.41	854	15.96	1752	20.85
6 Don’t know	183	5.99	466	8.71	649	7.72
Total	3053	100.00	5351	100.00	8404	100.00

Table 7.

Number of male and female students in the Student monitor subsample according to the extent to which they have taken their opportunities on the labor market into account when making their study choice

Labor market opportunities into account	Gender					
	Male		Female		Total	
	Number of observations	Percentage of respondents	Number of observations	Percentage of respondents	Number of observations	Percentage of respondents
Not taken into account at all	93	8.60	165	7.97	258	8.18
Not taken into account	157	14.51	434	20.96	591	18.74
Slightly taken into account	467	43.16	974	47.03	1441	45.70
Taken into account	283	26.16	422	20.38	705	22.36
Much taken into account	82	7.58	76	3.67	158	5.01
Total	1082	100.00	2071	100.00	3153	100.00
Missing	1971		3280		5251	
Total	3053		5351		8404	

Table 8.

Number of male and female students in the Student monitor subsample according to the importance of the opportunities on the labor market as a choice motive for their master making their study choice

Master motive	Gender					
	Male		Female		Total	
	Number of observations	Percentage of respondents	Number of observations	Percentage of respondents	Number of observations	Percentage of respondents
1 Very unimportant choice motive	67	4.86	111	4.97	178	4.93
2	127	9.21	253	11.34	380	10.52
3	238	17.26	444	19.89	682	18.89
4	526	38.14	912	40.86	1438	39.82

Table 8 continued.

5 Very important choice motive	421	30.53	512	22.94	933	25.84
Total	1379	100.00	2232	100.00	3611	100.00
Missing	1674		3119		4793	
Total	3053		5351		8404	

4. Method

As mentioned in the data section, this paper uses two different datasets. The first data set from DUO on enrolled and graduated university bachelor and master students is used to display the gender differences in study choices in the Netherlands. The second dataset from Student monitor is used to test these differences empirically. The latter is elaborated in the next section.

4.1 Hypotheses 1a and 1b

In order to examine if gender differentiation in study choices still exists in the Netherlands, several probit regressions are run. This specific regression model is used to examine the effect of being a woman on the probability that a student chooses a particular major. The regression gives us a z-score which can be translated into a probability value using the normal distribution. As mentioned in the Data section this paper focuses on the CROHO components Economics and Science on the one hand and Healthcare and Behaviour & Society on the other. Since the Student Monitor dataset consists of both bachelor and master students, a distinction is made between these two groups. By running two separate probit regressions, it is possible to examine whether the gender distribution of study programs differs per level of education (bachelor/master). The probit regressions that are used to test Hypotheses 1a and 1b are the following:

$$Z_{bs_i} = \alpha + \beta_1 female_i + \gamma X_i + \varepsilon_i \quad (1)$$

$$Z_{ms_i} = \alpha + \beta_1 female_i + \varepsilon_i \quad (2)$$

Here, the dependent variable Z_{bs_i} stands for the z-score which can be translated into the probability that student i choses a bachelor in sector *s.* The dependent variable of regression (2), Z_{ms_i}, stands for the z-score which can be translated into the probability that student i choses a master in sector *s.* Several regressions are run so that each study sector s is examined separately. The independent variable $female_i$ is a dummy variable which equals 1 if student i is a woman and β_1 is the corresponding parameter. ε is the random error of student i.

In addition, X_i stands for a vector of control variables and γ is the corresponding coefficient. Control variables are added separately to test whether the statistical significance of the variable of interest ($female$) stays more or less the same after adding other variables. As mentioned in the Theoretical framework, social and economic background influence study choice as well besides gender. For that reason, variables related to the migration background of the students and the socio-economic background and financial position of their parents are added to the regression along with time fixed effects and the age of the students. The control variables are added in a logical order. Time fixed effects, the age of the student and their migration background are added separately. In another regression, the financial and social position of the students' parents are added simultaneously as these two positions are presumably strongly related to each other. The ordinal variables regarding the financial and social position of the students' parents are treated as categorical variables. The use of ordinal variables as categorical variables is approved (Williams, 2019). In the survey of 2016 and 2017, students were asked to give their opinion on their mother's and father's income separately compared to the average income ('*modaal inkomen'* in Dutch). However, in the survey of 2018, students were asked how they valued the financial position of their parents in general and together. Since the survey questions regarding the financial position of the students' parents changed from 2016 and 2017 to 2018, three different variables are added to the regression.

4.2 Hypothesis 2

Besides investigating whether horizontal gender-differentiation in postsecondary education still exists, this paper also examines whether labor market expectations shape students' choice of study field. By looking at the answers of the participants of the Student monitor to the questions I., II. and III., this effect is empirically tested. The answers to these questions are added to the regressions (1) and (2) as continuous variables. A justification for the use of these ordinal variables as continuous variables is given in the Results section. The focus is now on the study sector Economics since horizontal gender-differentiation in this sector could potentially be a cause for the lack of women in top positions. The probit regressions are as follows:

$$Z_{bs_i} = \alpha + \beta_1 female_i + \beta_2 Q_{1i} + \beta_3 Q_{2i} + \varepsilon_i \quad (3)$$

$$Z_{ms_i} = \alpha + \beta_1 female_i + \beta_2 Q_{1i} + \beta_3 Q_{2i} + \beta_4 Q_{3i} + \beta_5 age_i + \varepsilon_i \quad (4)$$

Here, the variables Z_{bs_i}, Z_{ms_i} and $female_i$ stand for the same variables as in regressions (1) and (2). The variables Q_{1i}, Q_{2i} and Q_{3i} represent the answers to the questions I., II. and III. respectively and β_2, β_3 and β_4 are their corresponding coefficients. Numerous regressions are run with the question

variables separately and simultaneously. Besides, the variable age_i, which represents the age of student i with its corresponding coefficient β_5, is added to the regressions for the master students since this may vary widely across this group of students. In addition, ε is the random error of student i. Note that the variable names Q_{1i}, Q_{2i} and Q_{3i} are used here for clarity and do not represent the names that are used in the rest of the paper. See Appendix A for the exact variable names that are used for the questions I., II. and III.

To examine whether these effects are different for male and female students, interaction effects are added to the regressions as well:

$$Z_{bs_i} = \alpha + \beta_1 female_i + \beta_2 Q_{1i} + \beta_3 Q_{2i} + \gamma_1 Q_{1i} * female_i + \gamma_2 Q_{2i} * female_i + \varepsilon_i \quad (5)$$

$$Z_{ms_i} = \alpha + \beta_1 female_i + \beta_2 Q_{1i} + \beta_3 Q_{2i} + \beta_4 Q_{3i} + \gamma_1 Q_{1i} * female_i + \gamma_2 Q_{2i} * female_i + \gamma_3 Q_{3i} * female_{it} + \varepsilon_i \quad (6)$$

Here, the variables Z_{bs_i}, Z_{ms_i}, $female_i$, and age_i stand for the same variables as in regressions (3) and (4). However, the variables Q_{1i}, Q_{2i}, Q_{3i} are different. To get a clear understanding of the interaction effect between $female_i$ and the question variables, the ordinal question variables are transformed into binary variables. Here, Q_{1i} equals 0 if student's i expectations of their opportunities on the labor market are (very) bad and equals 1 otherwise. Q_{2i} equals 0 if student i answered 'Not taken into account at all' or 'Not taken into account' to question II. and equals 1 otherwise. Lastly, Q_{3i} equals 0 if student i answered '1' (Very unimportant choice motive) or '2' to question III. and equals 1 otherwise. In addition, γ_1, γ_2 and γ_1 stand for the interaction effects between the binary variables Q_{1i}, Q_{2i}, Q_{3i} and the gender of student i, respectively. Besides, ε is the random error of student i. Here, several regressions are run for the interaction effects separately and simultaneously just as in as in regressions (3) and (4).

5. Results

5.1 Hypotheses 1a and 1b

The next section discusses the results of the regressions elaborated in the Method section. The interpretation of the results is based on a significance level of 5%. As pointed out in the Data section, this paper only focuses on study choices of university students and makes a distinction between bachelor and master students. In addition, since some groups may be over- or underrepresented in the subsample, each observation is weighted according to their corresponding weighting factor.

First of all, probit regressions (1) and (2) are run to test Hypothesis 1a and 1b which state that gender differentiation in study choices still exists in the Netherlands. Table 9 and 10 show the regression results for the study sectors Economics, Science, Healthcare and Behaviour & Society. These regressions only checked for time fixed effects (and not for other control variables) since data is used from multiple years. The results show that the variable $female$ has a significant effect for all study sectors and for both bachelor and master students. The effect of $female$ is negatively significant for the study sectors Economics (p = 0.000) and Science (p = 0.000) and positively significant for the study sectors Healthcare (p = 0.000) and Behaviour & Society (p = 0.000). This can be interpreted as the probability of a student following a study in the Economics or Science sector being significantly lower for female bachelor and master students, compared to male students. Additionally, the probability of a student following a study in the Healthcare and Behaviour & Society sector is significantly higher for female bachelor and master students, compared to male students.

Table 9.

Probit regression results of different study sectors on the gender of first-year bachelor students controlled for time

Variable	Economics	Science	Behaviour & Society	Healthcare
Female	-0.457***	-0.743***	0.478***	0.459***
	(0.062)	(0.049)	(0.058)	(0.057)
Constant	-0.807***	-0.734***	-1.270***	-1.465***
	(0.065)	(0.051)	(0.063)	(0.060)
Observations	4449	4449	4449	4449

Note. This table displays the probit regressions results of different dependent variables depending on the study sector (Economics, Science, Behaviour & Society and Healthcare) on the gender of the first-year bachelor students with robust standard errors in parentheses. Time dummies are added to the regression but left out of this table because of irrelevance. Significance denoted on the variables by asterisks: $*p$ <.10, $**p$ <.05, $***p$ <.01.

Table 10.

Probit regression results of different study sectors on the gender of first-year master students controlled for time

Variable	Economics	Science	Behaviour & Society	Healthcare
Female	-0.426***	-0.698***	0.534***	0.404***
	(0.062)	(0.052)	(0.056)	(0.061)

Table 10 continued.

Constant	-0.604*** (0.075)	-0.906*** (0.058)	-1.103*** (0.065)	-1.597*** (0.067)
Observations	3613	3613	3613	3613

Note. This table displays the probit regressions results of different dependent variables depending on the study sector (Economics, Science, Behaviour & Society and Healthcare) on the gender of the first-year master students with robust standard errors in parentheses. Time dummies are added to the regression but left out of this table because of irrelevance. Significance denoted on the variables by asterisks: $*p$ <.10, $**p$ <.05, $***p$ <.01.

The size of the effects can be evaluated when the z-scores are translated into probabilities. The effect size normally depends on the place on the normal distribution. In this regression, however, there are only two possible z-scores, depending on the gender of the student, which makes it easier to calculate the effect size. Table C1 and C2 of Appendix C show the probabilities of a student following a study in the sectors Economics, Science, Healthcare and Behaviour & Society for male and female students and the gender differences in these probabilities. When the probability of following a study in a particular sector is higher for female students compared to male students, the difference has a positive sign and a negative sign otherwise. These tables show that the effect *signs* are the same for bachelor and master students and that the effect *sizes* do not differ much between bachelor and master students. For example, the probability of a female student following a study in Economics is 11% lower for bachelor students and 12% lower for master students, compared to male students.

Secondly, control variables are added according to regression (1), to make sure that the statistical significance of the variable of interest $female$ stays more or less the same even after adding other variables. Table 11 shows the results of regression (1) for the sector Economics after adding control variables. The results of regression (1) with control variables for the sectors Science, Behaviour & Society and Healthcare can be found in Appendix C, Table C3 to C5. As mentioned in the Method section, the survey questions regarding the financial position of the students' parents changed from 2016 and 2017 to 2018. Therefore, Model 6 and 7 are only run on the observations of students that participated in the survey of 2018. Note that the time dummies are omitted from Model 7 because of collinearity. Multicollinearity arises here since the variables $Year$ and $Financial\ position\ parents$ correlate perfectly with each other. This is true because only respondents of the survey of 2018 answered the question about the financial position of their parents in general. In this case, the two independent variables measure approximately the same and it is therefore not possible to determine the effect of each variable individually. Besides, the difference between the number of observations of Model 1 and 5 and the difference between the number of observations of Model 1 and 6 is very large. This is due to the large number of missing values of the variables regarding the financial position of both parents and the income of the father and the mother separately (see Table B4, B5 and B6).

These missing values may be the result of a large number of students who have not answered the corresponding questions.

The results in Table 11 show that a female student still has a significantly lower probability *(p* < 0.01) of following a bachelor in Economics compared to male students in every model. The effect of $female$ remains significant for the sectors Science, Behaviour & Society and Healthcare as well (Appendix C Table C3 to C5). These findings imply that the results on gender are robust. Besides, the variable $year$ has no significant effect on the probability of a student following a study in all sectors which is in line with Barone (2011).

Table 11.

Probit regression results for study sector Economics on gender and several control variables of first-year bachelor students

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Female	-0.459*** (0.062)	-0.457*** (0.062)	-0.474*** (0.063)	-0.464*** (0.062)	-0.304*** (0.109)	-0.532*** (0.094)	-0.567*** (0.095)
Year							
- 2017		-0.041 (0.083)					
- 2018		0.101 (0.074)					(omitted)
Age			-0.072*** (0.019)				-0.090*** (0.028)
Immigrant				0.238** (0.105)			0.177 (0.154)
Income mother							
- Under middle-income					0.010 (0.225)		
- Middle-income					-0.377* (0.224)		
- Above middle-income					-0.096 (0.240)		
- Far above middle-income					-0.056 (0.337)		
Income father							
- Under middle-income					0.146 (0.379)		
- Middle-income					0.385 (0.238)		

Table 11 continued.

- Above middle-income					0.365 (0.342)		
- Far above middle-income					0.462 (0.362)		
Financial position parents							
- Not that good						0.040* (0.405)	-0.236 (0.354)
- Average						0.055 (0.417)	-0.313 (0.317)
- Good						0.128 (0.424)	-0.220 (0.313)
- Very good						0.364 (0.439)	0.118 (0.324)
Socialclass parents							
- 9					-0.538 (0.636)	(empty)	
- 8					-0.672 (0.548)	-0.117 (0.493)	
- 7					-0.773 (0.525)	-1.191** (0.536)	
- 6					-0.841* (0.509)	-0.354 (0.505)	
- 5					-0.915* (0.503)	-0.400 (0.504)	
- 4					-0.997** (0.504)	-0.378 (0.507)	
- 3					-0.978 * (0.507)	-0.422 (0.509)	
- 2					-0.677 (0.540)	-0.168 (0.526)	
- 1 (high)					-1.145* (0.650)	-0.141 (0.538)	
Constant	-0.778 *** (0.046)	-0.807*** (0.065)	0.608* (0.360)	-0.801*** (0.047)	-0.540 (0.527)	-0.419 (0.418)	1.251** (0.632)

Note. This table displays the probit regressions results of the dependent variable study sector Economics on the gender of the first-year bachelor students with standard deviations in parentheses. Significance denoted on the variables by asterisks: $*p < .10$, $**p < .05$, $***p < .01$.

To get a clearer view of what happens with the effect of the variable $female$ after adding control variables, the differences between the probabilities of female and male students are calculated from the z-scores for all the seven different models (see table C6 Appendix C). All calculations are based on the base levels of the variables. These base levels are equal to the lowest possible level of the (ordinal) variables. The variable age is not an ordinal variable but a continuous variable. However, a base value is needed for this variable as well in order to calculate the z-scores and cannot equal 0 in this regression. That is why the average age of the bachelor students is used here which equals 19 (Table B1, Appendix B). What can be seen from Table C6 in Appendix 6 is that the effect size of being a female student stays negative after adding several control variables and is between 9 and 17 percent.

So, it can be concluded that even after adding control variables, the probability of a female bachelor and master student following a study in the sectors Economics and Science is significantly lower compared to male students and this probability is significantly higher for women for the sectors Behaviour & Society and Healthcare. For this reason, the null hypothesis can be rejected. This is in line with Hypotheses 1a and 1b and previous studies (e.g. Bradley, 2000; Barone, 2011; Kalmijn & Van der Lippe, 1997; Gerber & Cheung, 2008).

5.2 Hypothesis 2

Secondly, probit regressions (3) to (6) are run to test Hypothesis 2 which states that the probability of a female-student choosing a study in Economics is lower for women who take their chances on the labor market into account when choosing their study field. To see whether expectations of one's opportunities on the labor market affects study choice in general, regressions (3) and (4) are run. By running regressions (5) and (6), it can be tested whether this effect is different for male and female students. As mentioned in the Method section, the question variables are added to regressions (3) and (4) as continuous variables. To check whether the continuous version is sufficient to use in the regressions, three regressions are run for all the question variables separately where both the continuous and categorical versions of the ordinal variables are used (Table C7, Appendix C). The categorical variables are not statistically significant (p > 0.05) which implies that the continuous versions can be used in the regressions (3) and (4) (Williams, 2019).

Table 12 and 13 show the results to regressions (3) and (4). The number of observations differs substantially between Model 1 and 2 of Table 12 and 13. This is due to the large number of missing values of variable $Labor\ market\ opportunities\ into\ account$ (see Table 7). These missing values may be the result of a large number of students who have not answered question II.

Table 12.

Probit regression results of study sector Economics on the gender students and labor market aspirations of first-year bachelor students

Variable	Model 1	Model 2	Model 3
Female	-0.459***	-0.322***	-0.327***
	(0.062)	(0.089)	(0.089)
Labor market opportunities	-0.014		-0.039
	(0.026)		(0.039)
Labor market opportunities into account		0.220***	0.221***
		(0.052)	(0.052)
Constant	-0.764***	-1.363***	-1.244***
	(0.108)	(0.147)	(0.192)
Observations	4449	2371	2371

Note. This table displays the probit regressions results of the dependent variable study sector Economics on the gender of the first-year master students with robust standard errors in parentheses. Time dummies are added to the regression as well but left out of this table because of irrelevance. Significance denoted on the variables by asterisks: $*p < .10$, $**p < .05$, $***p < .01$.

Table 13.

Probit regression results of study sector Economics on the gender students and labor market aspirations of first-year master students

Variable	Model 1	Model 2	Model 3	Model 4
Female	-0.407***	-0.669***	-0.425***	-0.658***
	(0.063)	(0.156)	(0.063)	(0.152)
Age	-0.015*	0.002	-0.018*	0.007
	(0.009)	(0.015)	(0.009)	(0.014)
Labor market opportunities	0.157***			0.219**
	(0.032)			(0.088)
Labor market opportunities into account		0.446***		0.353***
		(0.093)		(0.091)
Master motive			0.240***	0.193**
			(0.034)	(0.090)
Constant	-0.741***	-1.325***	-0.831***	-2.468***
	(0.239)	(0.433)	(0.241)	(0.487)
Observations	3613	781	3609	781

Note. This table displays the probit regressions results of the dependent variable study sector Economics on the gender of the first-year master students with robust standard errors in parentheses. Time dummies are added to the regression as well but left out of this table because of irrelevance. Significance denoted on the variables by asterisks: $*p < .10$, $**p < .05$, $***p < .01$.

The coefficients of $female$ stay negatively significant in all the models of Table 12 and 13. This implies that even after adding other variables, the probability of a student following a study in the Economics sector remains significantly lower for female bachelor and master students compared to male students which is again in line with Hypothesis 1a.

What can be noted from Model 1 of Table 12 is that the variable $Labor\ market\ opportunities$ has no significant effect (p = 0.607) on the probability of a bachelor student following a major in Economics. This means that the null hypothesis cannot be rejected, which states that a bachelor student's expectations of their chances on the labor market have no effect on the probability of a student following a study in Economics. However, this null hypothesis can be rejected for master students since the variable $Labor\ market\ opportunities$ is positively significant when this variable is added both separately (p = 0.000, Model 1 of Table 13) and simultaneously (p = 0.013, Model 4 of Table 13) with the other question variables to the regression. These findings imply that the probability of a master student following a study in Economics is significantly higher when a master student's expectations of their chances on the labor market are better.

Besides, the results of Model 2 of Table 12 and 13 show that the probability of following a study in Economics is significantly higher (p = 0.000) for a student that takes his/her expectations of their chances on the labor market more into account. This can be found for both bachelor and master students. In addition, the effect remains positively significant (p = 0.000) once all question variables are added to the regression (Model 3 of Table 12 and Model 4 of Table 13). This implies that the null hypothesis can be rejected.

An additional question was asked to master students (question III.). To recall, students were asked to indicate whether 'good opportunities on the labor market' was an important choice motive for their master's choice. The continuous variable of this question is added to the probit regression. The results of Model 3 of Table 13 show that the z-score significantly increases (p = 0.000) when this choice motive is more important to students for their master's choice. This indicates that master students for whom 'good opportunities on the labor market' is an important choice motive for their master's choice have a significantly higher probability of following a study in Economics. This effect remains positively significant (p = 0.032) once all question variables are added to the regression simultaneously.

To conclude this first part, bachelor and master students who took their labor market opportunities into account when choosing their studies have a significantly higher probability of studying in Economics, ceteris paribus. In addition, when a master student's expectations of their chances on the labor market are better, the probability of this student following a study in Economics is significantly

higher. Lastly, master students for whom 'good opportunities on the labor market' is an important motive for their master choice have a significantly higher probability of studying in Economics, ceteris paribus.

Next, regressions (5) and (6) are run to test whether this effect differs between male and female students. Table 14 and 15 show the results to these probit regressions with interaction effects. As mentioned in the Method section, binary variables are used in these regressions for the question variables and the observations are weighted according to their weighting factors again.

The coefficient of the variable $female$ remains negatively significant in all the models of Table 14. This means that the null hypothesis can be rejected for bachelor students even after adding interaction effects which is in line with Hypothesis 1a. This is not the same for master students as the coefficient of the variable female is not significant in Models 1, 2 and 4 of Table 15 (resp. p = 0.639, p = 0.052 and p = 0.308). This may be due to the use of too few data points.

Table 14 shows that the interaction effect between the variable $female$ and the question variable $Labor\ market\ opportunities\ into\ account$ is positively significant for bachelor students. This implies that the positive effect of the extent to which students take their opportunities on the labor market into account, on the probability of a student following a study in Economics, is significantly higher for female students. The null hypothesis can thus be rejected. These findings are in contradiction with Hypothesis 2 which stated that the probability of female-student choosing a business or economic oriented major is lower for women who take their chances on the labor market into account when choosing their study field. However, no significant effect of this interaction effect is found for master students. Besides, the interaction effects between the variable $female$ and the question variable $Labor\ market\ opportunities$ and the interaction effect between the variable $female$ and the question variable $Master\ motive$, are not significant for both bachelor and master students.

Table 14.

Probit regression results of different study sectors on the gender of first-year bachelor students, labor market aspirations and interaction effects

Variable	Model 1	Model 2	Model 3
Female	-0.694***	-0.771***	-1.390***
	(0.234)	(0.227)	(0.372)
Labor market opportunities	0.067		-0.244
	(0.188)		(0.238)
Labor market opportunities into account		0.184	0.189
		(0.182)	(0.183)
Female* Labor market opportunities	0.257		0.671**
	(0.242)		(0.335)
Female* Labor market opportunities into account		0.510**	0.496**
		(0.246)	(0.247)
Constant	-0.875***	-1.023 ***	-0.802***
	(0.189)	(0.167)	(0.257)
Observations	4449	2371	2371

Note. This table displays the probit regressions results of the dependent variable study sector Economics on the gender and labor market aspirations of the first-year bachelor students and the interaction effects between these two variables with standard deviations in parentheses. Significance denoted on the variables by asterisks: $*p < .10$, $**p < .05$, $***p < .01$.

Table 15.

Probit regression results of different study sectors on the gender of first-year master students, labor market aspirations and interaction effects

Variable	Model 1	Model 2	Model 3	Model 4
Female	-0.132	-0.707*	-0.573***	-0.723
	(0.282)	(0.365)	(0.207)	(0.709)
Age	-0.014	0.001	-0.014	0.003
	(0.009)	(0.016)	(0.009)	(0.016)
Labor market opportunities	0.773***			1.176***
	(0.225)			(0.503)
Labor market opportunities into account		0.631**		0.516*
		(0.281)		(0.281)
Master motive			0.478***	0.287
			(0.154)	(0.335)
Female* Labor market opportunities	-0.315			-0.595
	(0.288)			(0.621)
Female* Labor market opportunities into account		0.042		0.031
		(0.402)		(0.414)
Female* Master motive			0.151	0.637
			(0.217)	(0.473)
Constant	-1.007***	-0.883*	-0.663**	-2.199***
	(0.321)	(0.456)	(0.270)	(0.717)

Table 15 continued.

Observations	3613	781	3609	781

Note. This table displays the probit regressions results of the dependent variable study sector Economics on the gender and labor market aspirations of the first-year master students and the interaction effects between these two variables with standard deviations in parentheses. Significance denoted on the variables by asterisks: $*p$ <.10, $**p$ <.05, $***p$ <.01.

6. Conclusion and discussion

The aim of this study is to formulate an answer to the following question: What is the effect of gender and students' labor market expectations on the probability of a student choosing a business or economic oriented university study program in the Netherlands? Several probit regressions are run with data from Student monitor surveys to test two hypotheses. The results suggest that the probability of a female student pursuing a degree in the Economics and Science sectors is significantly lower compared to male students whereas this probability is significantly higher for the Behaviour & Society and Healthcare sectors. This is true for both bachelor and master students even after controlling for other variables. Therefore, Hypotheses 1a and 1b cannot be rejected. This implies that gender differentiation in study choices still exists in the Netherlands and that this differentiation is patterned along a scientific/economics – humanities divide. This is in line with previous studies (e.g. Bradley, 2000; Barone, 2011; Kalmijn & Van der Lippe, 1997; Gerber & Cheung, 2008).

Hypothesis 2 states that the probability of female-student choosing a business or economic oriented major or master is even lower for women who take their chances on the labor market into account when choosing their study field. This study found that the more a student takes his expectations of the labor market into account in their study choice, the significantly higher the probability of this student studying in Economics, ceteris paribus. This effect seems to be higher for bachelor female students as a significant interaction effect has been found between gender and whether or not you take your chances on the labor market into account when making your study choice. For that reason, the null hypothesis can be rejected. However, these findings are in contradiction with Hypothesis 2 as the opposite effect has been found to be correct. This (opposite) effect is related to the 'chilling' effect, but it is not the same effect. In fact, the 'chilling' effect is about the effect of lower returns on women's career choices whereas the effect tested in this paper is about the effect of women's expectations of their labor market chances on their study choices.

In addition, the results of this study imply that the probability of a student following a study in Economics is significantly higher when a student's expectations of their chances on the labor market are better. This is only the case for master students and not for bachelor students. However, this may be due to a breach of internal validity. First of all, participants may not have answered the survey

questions truthfully. For example, question I. asks students about their expectations of their chances on the labor market after they graduate from their current study and question II. asks students whether they took these expectations into account when making their study choice. Students will most likely choose a course of study that they believe offers them good job opportunities (Gerber & Cheung, 2008), which may result in most students answering positively on question I about their current study (Table 2). Even if students do not choose their study based on future job opportunities, their family and society may expect them to do so (Gabay-Egozi et al., 2015). For that reason, students may be reluctant to answer question II. other than choosing the answer option of including their employment prospects in their choice of study. As a matter of fact, Table 3 shows that more than 70 percent of the participants answered question II. by saying that they took their opportunities on the labor market (slighty/much) into account. For this reason, the variable on students' expectations of their chances on the labor market and whether they take this into account may have been measured inaccurately. Besides, the timing of the survey also affects the internal validity of this study. Every year, the first students are contacted in July which is at the end of the academic year. However, this study is interested in the effect of students' expectations of their chances on the labor market prior to their enrolment in scientific education besides the effect of gender. Because the survey is only taken at the end of the academic year, students may now have different opinions about their employment opportunities than before they started following a study at university. Further research could ask students about their expected labor market opportunities at the beginning of the academic year and for every sector besides their own study sector to get a more accurate measure of this variable.

Besides, Student monitor asks for students' expectations of their labor market opportunities in general and not for their motives behind this judgement. For example, this study found that female bachelor students tend to study in the sector Economics when they take their expected opportunities on the labor market into account. This study does not investigate the motives of female students behind the judgement of their expected labor market opportunities nor does it investigate the relationship between the effect of ones expected labor market opportunities and the effect of the extent to which students take these expectations into account. Female students may have focused on other parts of their job opportunities besides their future returns for example. This may result in women rating their future employment prospects higher than expected and may explain the positive effect on the probability of studying in Economics when they take these prospects into account. Therefore, this study cannot make any clear statements about the effect of the gender-differentiation in job returns on study choices. Further research could ask students about their motives for rating their expected opportunities on the labor market and examine the relationship between this rating and whether they take this into account when making their study choice.

This study shows that horizontal gender-differentiation in postsecondary education still exists. However, this study did not examine whether a degree in Economics improves the chances of someone ending up in a top position. The results of this study are therefore not sufficient to argue that gender-differentiation in study choices are a cause of the glass ceiling. In addition, as mentioned above, this study found a significantly positive interaction effect between being a female bachelor student and expected labor market opportunities. This implies that expected labor market opportunities increase rather than decrease the probability of a female bachelor student following a study in Economics when women take their opportunities into account. Based on these results, three suggestions can be made: improve women's labor market opportunities, encourage women to take their opportunities into account or do nothing. On the one hand, one could say that we should encourage women to study economics or business by improving their labor market opportunities since women who take these (positive) opportunities into account have a higher probability of studying in Economics. However, this study does not examine the causes of this positive effect of job opportunities taken into account and it cannot therefore be said with certainty that this positive effect is caused by positive labor market opportunities. Besides, one could argue that improving the employment opportunities of women is not needed since women already tend to study Economics when they take their labor market opportunities into account. It would therefore not be needed to increase their job market opportunities, but we should rather encourage women to take these opportunities into account when making their decision. However, this study did not examine whether this horizontal gender-differentiation in postsecondary education is bad and, therefore, it is not clear whether this gender-differentiation must be reduced at all. For that reason, the causes and consequences of the horizontal gender-differentiation in postsecondary education need further investigation, before any suggestions for policy can be made. Besides, no significant time fixed effects were found on study choices for university students in general. However, only three years of data has been used. In addition, this study did not examine whether the significant gender differences in study choices converge over time. Further research could look for long term time trends by examining the horizontal gender-differentiation in postsecondary education over a longer period of time.

7. References

Augier, M., & March, J. G. (2011). *The Roots, Rituals, and Rhetorics of Change: North American Business Schools After the Second World War*. Stanford Business Books.

Barone, C. (2011). Some Things Never Change: Gender Segregation in Higher Education across Eight Nations and Three Decades. *Sociology of Education, 84*(2), 157–176.

Bartunek, J. M., & Rynes, S. L. (2014). Academics and Practitioners Are Alike and Unlike. *Journal of Management*, *40*(5), 1181–1201. https://doi.org/10.1177/0149206314529160

Bradley, K. (2000). The Incorporation of Women into Higher Education: Paradoxical Outcomes. *Sociology of Education, 73*(1), 1–18. doi: 10.2307/2673196

Broek, dr. J.F.L.H. van den (ResearchNed) (2019a): *Studentenmonitor 2016*. DANS. https://doi.org/10.17026/dans-z8h-undf

Chakrabarti, A. (2009). Determinants of Participation in Higher Education and Choice of Disciplines: Evidence from Urban and Rural Indian Youth. *South Asia Economic Journal*, *10*(2), 371–402. https://doi.org/10.1177/139156140901000205

Daymont, T., & Andrisani, P. (1984). Job Preferences, College Major, and the Gender Gap in Earnings. *The Journal of Human Resources, 19*(3), 408-428.

Dienst Uitvoering Onderwijs. (2020a). *01 b. Wo-ingeschrevenen op domein type hoger onderwijs binnen soort hoger onderwijs - Databestanden - DUO Particulier* [Dataset]. Retrieved from https://duo.nl/open_onderwijsdata/databestanden/ho/ingeschreven/wo-ingeschr/ingeschrevenen-wo1b.jsp

Dienst Uitvoering Onderwijs. (2020b). *05. Aantal wo-gediplomeerden - Databestanden - DUO Particulier* [Dataset]. Retrieved from https://duo.nl/open_onderwijsdata/databestanden/ho/ingeschreven/wo-ingeschr/ingeschrevenen-wo5.jsp

Dienst Uitvoering Onderwijs. (n.d.). *Toelichting bestand / Wo / Ingeschrevenen / Bestand nr. 1b*. Retrieved from https://duo.nl/open_onderwijsdata/images/toelichting-01b-ingeschrevenen-wo-domein-wo.pdf

Eagly, A. H., & Karau, S. J. (2002). Role congruity theory of prejudice toward female leaders. *Psychological Review, 109*(3), 573–598.

Federal Glass Ceiling Commission. (1995). *Good for business: Making full use of the nation's human capital* (pp. 3). Washington, DC: U.S. Government Printing Office http://digitalcommons.ilr.cornell.edu/key_workplace/116/

Gabay-Egozi, L., Shavit, Y., & Yaish, M. (2015) Gender Differences in Fields of Study: The Role of Significant Others and Rational Choice Motivations. *European Sociological Review, 31*(3), 284–297.

Gerber, T., & Cheung, S. (2008). Horizontal Stratification in Postsecondary Education: Forms, Explanations, and Implications. *Annual Review of Sociology, 34*(1), 299-318.

Gerber, T. P., & Schaefer, D. R. (2004). Horizontal Stratification of Higher Education in Russia: Trends, Gender Differences, and Labor Market Outcomes. *Sociology of Education, 77*(1), 32-59.

Gordon, R. & Howell, J. (1959) Higher Education for Business. *The Journal of Business Education*, *35*(3), 115-117. doi: 10.1080/08832323.1959.10116245

Grant Thornton. (2019). *Aantal vrouwen in topfuncties blijft groeien, maar de absolute top is slechts voor weinigen bereikbaar*. Retrieved on May 21 from https://www.grantthornton.nl/persberichten/persberichten-2019/aantal-vrouwen-in-topfuncties-blijft-groeien-maar-de-absolute-top-is-slechts-voor-weinigen-bereikbaar/

Hinchliffe, E. (2020). *The number of female CEOs in the Fortune 500 hits an all-time record*. Retreived from https://fortune.com/2020/05/18/women-ceos-fortune-500-2020/

Ibarra, H., Ely, R. J., & Kolb, D. M. (2013). Women Rising: The Unseen Barriers. *Harvard Business Review, 91*(9), 60-67.

Jacobs, J.A. (1996). Gender inequality in higher education. *Annual Review of Sociology, 22*, 153-85.

Kalmijn, M., & Van der Lippe, T. (1997). Type of schooling and sex differences in earnings in the Netherlands. *European Sociological Review, 13*(1), 1-15.

Kieser, A., Nicolai, A., & Seidl, D. (2015). The Practical Relevance of Management Research: Turning the Debate on Relevance into a Rigorous Scientific Research Program. *The Academy of Management Annals, 9*(1), 143–233. https://doi.org/10.1080/19416520.2015.1011853

Management Scope. (2019). *Top-100 Corporate Vrouwen 2019*. Retrieved on May 21 from https://managementscope.nl/top/machtigste-vrouwen

Pfeffer, J., & Fong, C. (2002). The End of Business Schools? Less Success than Meets the Eye. *Academy of Management Learning & Education, 1*(1), 78-95.

ResearchNed (2019b): *Studentenmonitor 2017*. DANS. https://doi.org/10.17026/dans-xwb-kdty

ResearchNed (2019c): *Studentenmonitor 2018*. DANS. https://doi.org/10.17026/dans-zbu-y5rm

U.S. Bureau of Labor Statistics. (2020). *Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity*. Retrieved from https://www.bls.gov/cps/cpsaat11.htm

Williams, R. (2019). *Ordinal Independent Variables.* Retrieved from https://www3.nd.edu/~rwilliam/xsoc73994/OrdinalIndependent.pdf

Wiswall, M., & Zafar, B. (2018). Preference for the Workplace, Investment in Human Capital, and Gender, *The Quarterly Journal of Economics*, *133*(1), 457-507. doi: 10.1093/qje/qjx035

Appendix A

Table A1.

Variables names with their corresponding questions and answer options per survey year

Variable name	Question in survey	Answer options	Q# in 2016	Q# in 2017	Q# in 2018
Female	Are you a man or a woman?	1. Woman 2. Man	72	63	66
Bama	How can you characterize your education?	1. Bachelor's degree 2. Master's degree 3. University teacher training 4. Associate degree 5. Premaster / transition study	13	3	3
Studysector	In which sector do you study?	1. Economics 2. Behaviour & Society 3. Healthcare 4. Agriculture and natural environment 5. Nature 6. Education 7. Law 8. Cross-sectoral 9. Language & Culture 10. Science	5	6	6
Year1educ	In which year and in which month were you enrolled for your current study program?	Numeric answer	7b	8b	8b

Table A1 continued.

Labor market opportunities into account	Have you taken your job opportunities into account in your choice of study? (II.)	1. I have not taken this into account at all 2. I have not taken this into account 3. I have taken this slightly into account 4. I have taken this into account 5. I have taken this very much into account			
Master motive	What are the main motives for you to follow this master's program? (III.) - This master offers me good opportunities on the labor market	Students could choose a number between 1 and 5 where 1 stood for 'very unimportant choice motive' and 5 stood for 'very important choice motive'.	69a	60a	63a
Labor market opportunities	How do you assess your chances on the Dutch labor market after obtaining your diploma from your current education? (I.)	Students could choose a number between 1 and 6 where 1 stood for 'very bad', 5 stood for 'very good' and 6 stood for 'don't know'	58a	105a	110a

Table A1 continued.

Income father & income mother	How do you characterize your parents' income? Tick both columns or in the last column one box. Note: An average income per person gross per year is € 36,500.	1. Far below middle-income 2. Under middle-income 3. Middle-income 4. Above middle-income 5. Far above middle-income 6. Do not know 7. Not applicable	90	80	-
Financial position parents	How well are your parents or caregivers financially, if you compare this to other families?	1. Very good 2. Good 3. Average 4. Not that good 5. Not very good at all	-	-	84
Social class parents	Some people are high on the social ladder, others a little lower. If you look at your own background, where do you place your parents / guardians on the social ladder?	Students could choose a number between 1 and 10 where 1 stood for 'low social class and 5 stood for 'high social class'.	91	81	85
Labor income	How much do you earn on average per month?	Numeric answer	133	123	128
Birthyear	When were you born?	Date	71	62	65
Hbo_wo	Are you studying at a university (wo) or college (hbo)? If you are following more than one course of study, fill in the questions for your main course:	1. At a university 2. At a college	2	2	2

Table A1 continued.

Enrolled	Are you enrolled in a study program at a university or college in the academic year [academic year in which the survey was taken]?	1. Yes, I am currently enrolled in a higher education program 2. Yes, I am currently studying abroad 3. I was registered but I stopped studying after February 1 4. I was registered but I stopped studying before February 1 5. No, I was not enrolled in the academic year [academic year in which the survey was taken]	1	1	1
Immigrant	Where were you and your parents born?	Students could choose from a dropdown list of countries. However, the variable of this question in the dataset simply shows if the student has a migration background or not.	92	82	86

Note. The questions and answer options do not have the same format for every year; therefore, the most frequently asked questions and answer options are used. The questions in this table are not the original questions but have been translated from Dutch. In this table, Q# stands for 'question number'.

Appendix B

Table B1.

Summary statistics of the continuous variable age in the Student monitor subsample of bachelor and master students

Variable	Number of observations	Mean	Standard Deviation	Minimum	Maximum
Age (bachelor)	4449	19.16	2.83	16	60
Age (master)	3613	23.27	3.00	18	56

Table B2.

Number of students in the Student monitor subsample according to their migration background

	Number of observations	Percentage of respondents
Native	7628	91.29
Immigrant	728	8.71
Total	8356	100.00
Missing	48	
Total	8404	

Table B3.

Number of students in the Student monitor subsample according to the opinion of the students regarding the social position of their parents

		Number of observations	Percentage of respondents
1	High social class	169	2.01
2		577	6.87
3		2193	26.09
4		2323	27.64
5		1484	17.66
6		759	9.03
7		479	5.70
8		279	3.32
9		78	0.93

Table B3 continued.

10	Low social class	63	0.75
Total		8404	100.00

Table B4.

Number of students in the Student monitor subsample according to the opinion of the students regarding the financial position of their mother (Survey of 2016 & 2017)

	Number of observations	Percentage of respondents
Far below middle-income	291	10.30
Under middle-income	625	22.13
Middle-income	753	26.66
Above middle-income	531	18.80
Far above middle-income	90	3.19
Do not know	212	7.51
Not applicable	322	11.40
Total	2824	100.00
Missing	5580	
Total	8404	

Table B5.

Number of students in the Student monitor subsample according to the opinion of the students regarding the financial position of their father (Survey of 2016 & 2017)

	Number of observations	Percentage of respondents
Far below middle-income	90	3.19
Under middle-income	254	8.99
Middle-income	541	19.16
Above middle-income	1105	39.13
Far above middle-income	439	15.55
Do not know	243	8.60
Not applicable	152	5.38
Total	2824	100.00

Table B5 continued.

Missing	5580
Total	8404

Table B6.

Number of students in the Student monitor subsample according to the opinion of the students regarding the financial position of their parents (Survey of 2018)

	Number of observations	Percentage of respondents
Very good	446	13.71
Good	1408	43.30
Average	971	29.86
Not that good	342	10.52
Not very good at all	85	2.61
Total	3252	100.00
Missing	5152	
Total	8404	

Table B7.

Number of students in the Student monitor subsample by year

	Number of observations	Percentage of respondents
2016	2486	29.58
2017	2666	31.72
2018	3252	38.70
Total	8404	100.00

Appendix C

Table C1.

Probabilities of male and female bachelor students following a study in several study sectors

Study sector	Male students	Female students	Difference
Economics	20.975	10.307	-10.668
Science	23.136	6.975	-16.161
Behaviour and Society	10.197	21.411	+11.215
Healthcare	7.153	15.721	+8.569

Note. The numbers in the table represent probabilities as percentages.

Table C2.

Probabilities of male and female master students following a study in several study sectors

Study sector	Male students	Female students	Difference
Economics	27.281	15.138	-12.142
Science	18.246	5.437	-12.810
Behaviour and Society	13.501	28.476	+14.976
Healthcare	5.510	11.633	+6.123

Note. The numbers in the table represent probabilities as percentages.

Table C3.

Probit regression results for study sector Science on gender and several control variables of first-year bachelor students

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Female	-0.743***	-0.743***	-0.784***	-0.740***	-0.850***	-0.730***	-0.744***
	(0.048)	(0.049)	(0.050)	(0.049)	(0.083)	(0.080)	(0.081)
Year							
- 2017		-0.016					
		(0.063)					
- 2018		-0.030					(omitted)
		(0.061)					
Age			-0.160***				-0.124***
			(0.021)				(0.027)
Immigrant				-0.083			-0.006
				(0.088)			(0.141)

Table C3 continued.

Income mother			
- Under middle-income	0.109		
	(0.183)		
- Middle-income	0.032		
	(0.183)		
- Above middle-income	0.171		
	(0.188)		
- Far above middle-income	0.509**		
	(0.257)		
Income father			
- Under middle-income	0.602*		
	(0.341)		
- Middle-income	0.636**		
	(0.322)		
- Above middle-income	0.685**		
	(0.316)		
- Far above middle-income	0.646**		
	(0.327)		
Financial position parents			
- Not that good		-0.014	-0.391
		0.322	0.309
- Average		0.100	-0.224
		0.323	0.279
- Good		0.164	-0.156
		0.334	0.278
- Very good		0.235	-0.046
		0.354	0.290
Socialclass parents			
- 9	(empty)	-0.246	
		(0.566)	
- 8	-0.012	-0.734	
	(0.625)	(0.453)	
- 7	-0.476	-0.201	
	(0.621)	(0.410)	
- 6	-0.178	-0.202	
	(0.594)	(0.410)	
- 5	-0.016	-0.405	
	(0.590)	(0.413)	
- 4	0.191**	-0.238**	
	(0.585)	(0.413)	
- 3	0.113	-0.079	
	(0.588)	(0.417)	
- 2	0.170	-0.113	
	(0.605)	(0.443)	
- 1 (high)	-0.050*	-0.366*	
	(0.647)	(0.499)	

Table C3 continued.

Constant	-0.752*** (0.035)	-0.734*** (0.051)	2.305*** (0.407)	-0.746*** (0.036)	-1.516** (0.596)	-0.684* (0.356)	1.778*** (0.629)
Observations	4449	4449	4449	4419	1572	1579	1566

Note. This table displays the probit regressions results of the dependent variable study sector Science on the gender of the first-year bachelor students and several control variables with standard deviations in parentheses. Significance denoted on the variables by asterisks: $*p$ <.10, $**p$ <.05, $***p$ <.01.

Table C4.

Probit regression results for study sector Behaviour & Society on gender and several control variables of first-year bachelor students

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Female	0.480*** (0.058)	0.478*** (0.058)	0.485*** (0.058)	0.482*** (0.058)	0.441*** (0.099)	0.483*** (0.089)	0.497*** (0.090)
Year							
- 2017		0.096 (0.067)					
- 2018		0.057 (0.064)					(omitted)
Age			0.013* (0.007)				0.008 (0.011)
Immigrant				-0.311*** 0.097			-0.113 (0.136)
Income mother							
- Under middle-income					0.249 (0.188)		
- Middle-income					0.084 (0.184)		
- Above middle-income					0.084 (0.184)		
- Far above middle-income					0.027 (0.206)		
Income father							
- Under middle-income					0.474 (0.291)		
- Middle-income					0.182 0.277		
- Above middle-income					0.182 (0.277)		
- Far above middle-income					0.159 (0.270)		

Table C4 continued.

Financial position parents							
- Not that good						0.174	0.085
						(0.269)	(0.287)
- Average						0.246	0.145
						(0.265)	(0.269)
- Good						-0.019	-0.105
						(0.275)	(0.270)
- Very good						-0.163	-0.279
						(0.300)	(0.290)
Socialclass parents							
- 9					-0.341	-0.533	
					(0.677)	(0.547)	
- 8					-0.418	-0.527	
					(0.552)	(0.417)	
- 7					-0.395	-0.104	
					(0.549)	(0.399)	
- 6					-0.474	-0.294	
					(0.518)	(0.396)	
- 5					-0.409	-0.363	
					(0.515)	(0.396)	
- 4					-0.415	-0.284	
					(0.514)	(0.397)	
- 3					-0.355	-0.235	
					(0.517)	(0.399)	
- 2					-0.385	-0.299	
					(0.540)	(0.426)	
- 1 (high)					-0.596	-0.848	
					(0.587)	(0.521)	
Constant	-1.212***	-1.270***	-1.461***	-1.187***	-0.895	-0.996**	-1.351***
	(0.049)	(0.063)	(0.145)	(0.050)	(0.552)	(0.397)	(0.369)
Observations	4449	4449	4449	4419	1590	1579	1566

Note. This table displays the probit regressions results of the dependent variable study sector Behaviour & Society on the gender of the first-year bachelor students and several control variables with standard deviations in parentheses. Significance denoted on the variables by asterisks: $*p < .10$, $**p < .05$, $***p < .01$.

Table C5.

Probit regression results for study sector Healthcare on gender and several control variables of first-year bachelor students

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Female	0.459***	0.459***	0.448***	0.454***	0.442***	0.419***	0.393***
	(0.057)	(0.057)	(0.057)	(0.057)	(0.097)	(0.095)	(0.095)
Year							
- 2017		0.011					
		(0.061)					
- 2018		0.101					(omitted)
		(0.074)					
Age			0.046***				-0.048*
			(0.016)				(0.027)
Immigrant				0.146*			0.185
				(0.085)			(0.139)
Income mother							
- Under middle-income					-0.133		
					(0.174)		
- Middle-income					0.121		
					(0.171)		
- Above middle-income					-0.021		
					(0.176)		
- Far above middle-income					-0.636**		
					(0.317)		
Income father							
- Under middle-income					-0.784***		
					0.300		
- Middle-income					-0.433		
					0.266		
- Above middle-income					-0.356		
					(0.258)		
- Far above middle-income					-0.305		
					(0.271)		
Financial position parents							
- Not that good						0.871***	0.897**
						(0.324)	(0.433)
- Average						0.772**	0.815*
						(0.313)	(0.424)
- Good						0.779**	0.854**
						(0.321)	(0.424)
- Very good						0.611*	0.673
						(0.344)	(0.437)

Table C5 continued.

Socialclass parents							
- 9					-0.851	0.216	
					(0.689)	(0.695)	
- 8					-0.583	0.111	
					(0.537)	(0.475)	
- 7					-0.453	0.157	
					(0.532)	(0.467)	
- 6					-0.487	0.073	
					(0.510)	(0.465)	
- 5					-0.489	0.186	
					(0.502)	(0.453)	
- 4					-0.431	0.262	
					(0.499)	(0.456)	
- 3					-0.481	0.200	
					(0.501)	(0.460)	
- 2					-0.398	0.262	
					(0.521)	(0.481)	
- 1 (high)					-0.260	-0.036	
					(0.570)	(0.661)	
Constant	-1.484***	-1.465***	-0.600**	-1.500***	-0.643	-2.449***	-1.394*
	(0.049)	(0.060)	(0.297)	(0.050)	(0.543)	(0.680)	(0.712)
Observations	4449	4449	4449	4419	1590	1579	1566

Note. This table displays the probit regressions results of the dependent variable study sector Healthcare on the gender of the first-year bachelor students and several control variables with standard deviations in parentheses. Significance denoted on the variables by asterisks: $*p$ <.10, $**p$ <.05, $***p$ <.01.

Table C6.
Differences between the probabilities of male and female master students following a bachelor study in Economics for different models

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Differences	-11.024	-10.672	-17.511	-10.863	-9.526	-16.681	-14.151

Note. The numbers in the table represent probabilities as percentages.

Table C7.

Probit regression results for study sector Economics on the continuous and categorical versions of the question variables

Variable	Model 1	Model 2	Model 3
Labor market opportunities (continuous)	-0.005 (0.221)		
- 2	(omitted)		
- 3	0.271 (0.285)		
- 4	0.398 (0.496)		
- 5 (very good)	0.652 (0.715)		
Labor market opportunities into account (continuous)		-0.100 (0.211)	
- Not taken into account		(omitted)	
- Slightly taken into account		0.425 (0.303)	
- Taken into account		0.801 (0.507)	
- Taken very much into account		1.334* (0.702)	
Master motive (continuous)			-0.017 (0.224)
- 2			(omitted)
- 3			0.217 (0.326)
- 4			0.529 (0.533)
- 5 (very important)			0.821 (0.753)
Constant	-1.275*** (0.198)	-1.235*** (0.172)	-1.293*** (0.183)
Observations	8404	3153	3611

Note. This table displays the probit regressions results of the dependent variable study sector Economics on the continuous and categorical versions of the question variables of first-year students with robust standard errors in parentheses. Time dummies are added to the regression as well but left out of this table because of irrelevance. Significance denoted on the variables by asterisks: $*p$ <.10, $**p$ <.05, $***p$ <.01.