

The educational and occupational aspirations of Belgian students: what role for gender?

An analysis based on individual data from PISA 2018

Author : Maxine Coppé

Thesis Director: Professor Bruno Van der Linden

Thesis Joint Director and Reader: Professor Trudie Schils

Academic Year 2019-2020

In order to obtain the Double Degree

Master 120 en Sciences économiques, Orientation générale, Finalité spécialisée (UCL/UNamur)

and

Master of Science in Economic Studies (Maastricht University)

ABSTRACT

This thesis considers educational and occupational aspirations, primarily, because of the role they play in the gender wage gap. The objectives of this research are twofold. First, it investigates the determinants of aspirations and the role of gender in aspirations. Second, it evaluates the alignment of educational performances and aspirations and the role of gender in it. After a review of the literature, I formulate two hypotheses related to the objectives of my research. Using data for Belgium from PISA 2018, I performed descriptive and econometric analysis on educational and occupational aspirations to check my hypotheses. My analysis shows mixed results for the relationships between the different determinants and aspirations. While the results confirm the unalignment of performance and aspirations. However, the role of gender is not the one I expected as performance is more important in aspirations for girls. Finally, I recommend reinforced efforts on gender equality in terms of aspirations.

ACKNOWLEDGEMENTS

This thesis would not have been possible without the help of my thesis supervisor and my second reader. I had the chance to run into the supervisor and the second reader that any student would want.

I would like first to thank my thesis supervisor Professor Bruno Van der Linden at UCLouvain. Professor Bruno Van der Linden was always there to help me and had allowed me to communicate with him effectively. He provided insight and expertise that greatly assisted the writing of my thesis.

Second, I am grateful for my second reader Professor Trudie Schills at Maastricht University. Professor Trudie Schills has always looked carefully at my work. She always had a kind or encouraging word during our exchanges. She also offered me improvements and ideas that were very helpful to me.

Third, I would like to express gratitude to all the Professors I had at UCLouvain, Trinity College Dublin, Maastricht University and UNamur. They allowed me to acquire the skills and pieces of knowledge necessary for the realization of this thesis and helped me to develop my interest in the economy and more precisely in labour economics.

Lastly, I wish to thank my friends and my family for their support, pieces of advice, and feedbacks. It is valid for this thesis but also for all these years at the university.

TABLE OF CONTENTS

Introduction	5
1 Chapter 1: Literature Review	7
1.1 Occupational and Educational aspirations.....	8
1.1.1 Measurement of the level of aspirations.....	8
1.1.2 Importance of aspirations	9
1.1.3 General determinants of the level of aspirations	9
1.1.4 Gender-related determinants of the level of aspirations	14
1.2 Gender Wage Gap	17
1.2.1 General causes of the gender wage gap.....	18
1.2.2 Link between the gender wage gap and occupational aspirations.....	21
1.2.3 Situation in Europe and Belgium.....	23
1.3 Educational performance.....	26
1.3.1 Gender differences.....	26
1.3.2 Other sources of differences.....	27
1.4 Hypotheses	29
2 Chapter 2: Data Description	31
2.1 Dependent variables	31
2.1.1 First question: educational aspirations	31
2.1.2 Second question: occupational aspirations	32
2.1.3 Third question: situation in 5 years	34
2.2 Independent variables.....	36
2.2.1 Individual determinants.....	36
2.2.2 Socioeconomic determinant	37
2.2.3 Parental determinants	38
2.2.4 Scholar determinants	43
2.2.5 Social group determinants	47
2.2.6 Social determinants	49
2.2.7 Gender-related determinants	50
3 Chapter 3: Approach and results	55
3.1 Correlations	55
3.2 Regressions.....	58
3.2.1 Educational aspirations.....	58
3.2.2 Occupational aspirations	62
3.2.3 Situation in 5 years	64

3.2.4	Interaction between gender and performances	68
3.3	Summary of the results.....	70
3.3.1	Hypothesis 1	70
3.3.2	Hypothesis 2	71
4	Chapter 4: Discussion.....	73
4.1	Results	73
4.2	Contribution of the results.....	75
4.3	Limits and extensions	75
4.4	Recommendations	75
	Conclusion.....	76
	References	77
	Appendices	85

INTRODUCTION

It is widely recognized that a gender wage gap persists in Belgium and more broadly in most countries. However, we often neglect the role of occupational segregation in this gap. Indeed, gender differences in occupation and industry are an important factor to explain the gender wage gap. More broadly, differences in gender roles, in occupations and in industries combined with the gender division of labour are key factors (Blau & Kahn, 2017). Furthermore, we forget the role of aspirations in occupational segregation and therefore, we ignore the strong correlation between occupational aspirations and actual occupations in the future (Gianettoni & Guillely, 2015). It is because aspirations and actual occupations are phenomena happening on different temporality. Therefore, I decided to look at the determinants of aspirations. I also think that aspirations may be unaligned on performances. If it is the case, we would waste talents and incur a loss to the economy. Indeed, if individuals with high ability do not use their potential, the economy loses the surplus that these individuals may generate (Hegewish, Liepmann, Hayes, & Hartmann, 2010). I also believe that the relationship between performance and aspirations may be biased by gender in favour of boys. On one side, girls reach higher grades than boys throughout their school years (Smith, 2014). On the other side, a couple of studies find that gender has a significant impact on aspirations and women have lower aspirations (Marini & Greeberger, 1978; Furlong & Biggart, 2006; Archer, DeWitt, & Wong, 2013; Barbulescu & Bidwell, 2013; Gemici, Bednarz, Karmel, & Lim, 2014).

My motivations for this research are the persistent inequalities related to gender wage gap (Aláez-Aller, Longás-García, & Ullibarri-Arce, 2011; Blau & Kahn, 2017; European Parliament, 2020) but also the importance of aspirations of the current students, for the future economy. Moreover, I would like to verify some empirical findings that apply to other countries or other periods. I expect to contribute to the literature by analyzing the aspirations of Belgian students via a collection of background indicators. In this context, the PISA databases fit my needs by proposing individual data on performances, aspirations, and students' environment. These databases have already been used to study aspirations but only using descriptive statistics and focusing on a few determinants. I expect to confirm existing results but also to discover new ones.

In this thesis, I consider two hypotheses separately. The first one is very large and mentions the role of a series of variables in aspirations. And beyond these variables, the first hypothesis states that gender-related determinants are correlated with the level of educational and occupational aspirations. These variables are based on the literature and regrouped in six groups of determinants: individual determinants (performance and extracurricular activities), socioeconomic determinant (socioeconomic status), parental determinants (expectations, level of education, involvement and occupation), scholar determinants (size, type of education, quality of the teacher, encouragement of the teacher, resources, information on the labour market and peer effect), social group determinants (immigration background and language) and social determinant (access to university). The gender-related determinants are opportunities, gender-typical occupations, self-concept and preferences.

The second hypothesis focusses on the alignment between performances and aspirations and the role of gender in this alignment. It states that performances are not aligned on performance and that gender plays a role in it. This hypothesis is more based on intuitions. All hypotheses consider aspirations at the individual level as I consider the aspirations of each student. I also take into account both occupational and educational aspirations.

In order to verify my hypotheses, I use PISA data for 2018. I also restrict myself to Belgium. I have three dependent variables measuring educational aspirations, occupational aspirations, and the expected situation of the student in 5 years. I have many independent variables regrouped in the same seven groups as in the first hypothesis. Methodologically speaking, I start by simple correlation tables as a non-negligible share of papers on aspirations do not go further. Then I run classic OLS regressions and logistic regressions, depending on the dependent variables.

My main findings partially confirm my first hypothesis as some determinants play a role, some do not play a role, and some play a role but not the expected role in aspirations. Among others, I can confirm the positive relationship between aspirations and socioeconomic status and parental expectations. While I cannot confirm the negative relationship with the migration background, for example. My findings are mixed on gender-related determinants. For the second hypothesis, I can confirm that performances and aspirations are not systematically correlated and that the gender may make a difference but not necessarily in the way I expected. Indeed, it seems that performances are more important for girls' aspirations.

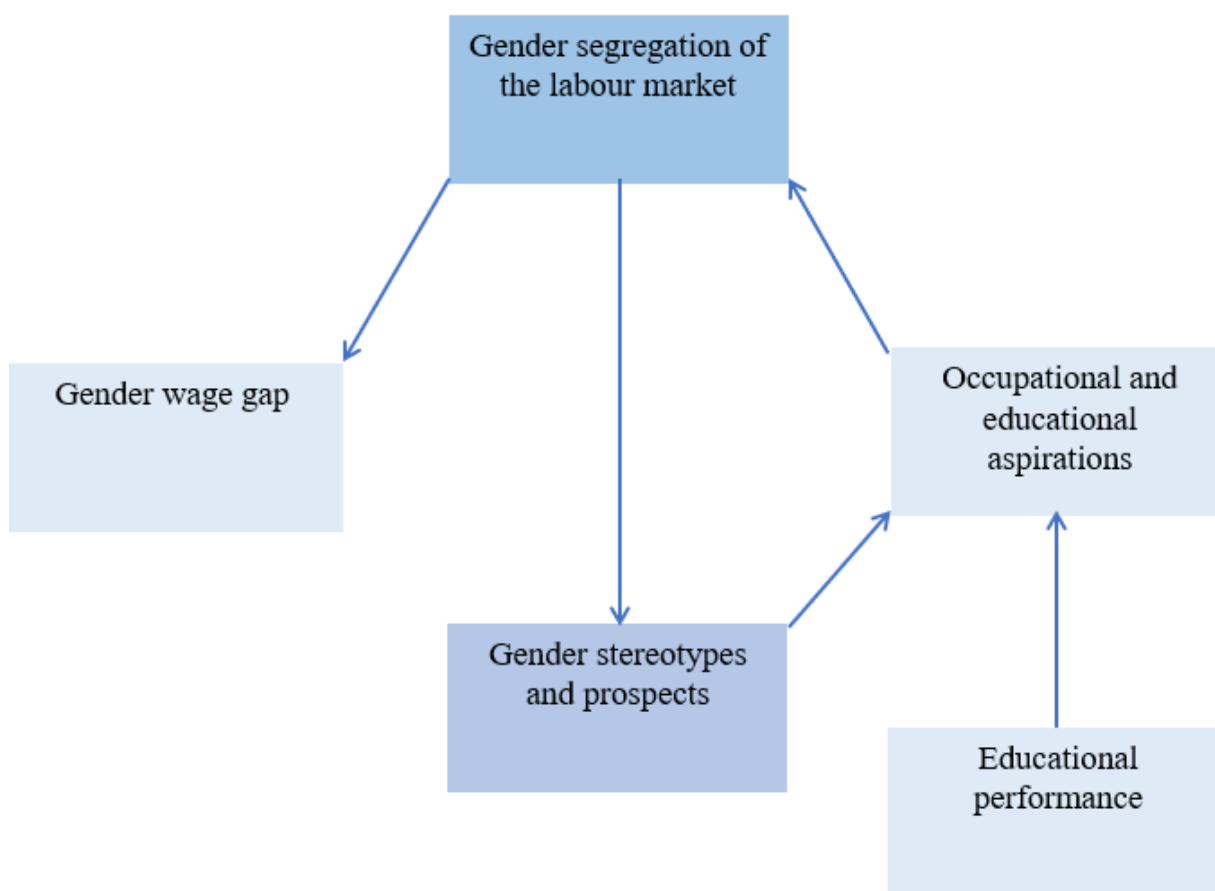
In the discussion, I summarize the contribution of my results in the literature. I also discuss the limitations and the potential extensions of my research, both in terms of methodology and of application of the results. I highlight the fact that my results establish correlation and not causality. Finally, I present recommendations related to the implications of my results. My results emphasize the need to study aspirations. They also show that some efforts must be pursued and reinforced to achieve aspirational equality and therefore, to reduce occupational segregation at adult age.

The rest of the thesis is organised as follows. Chapter 1 presents the literature review and a visual representation of my thesis. Chapter 2 describes the data necessary for the verification of my hypotheses. Chapter 3 develops the results of the econometric analysis and their meaning. Chapter 4 discusses the results and limits of the thesis. Finally, I conclude.

1 CHAPTER 1: LITERATURE REVIEW

The objective of this section is to propose a literature review as complete as possible on the three facets of my thesis. This chapter brings general elements of knowledge but also, information that is particularly useful for the econometric analysis. Figure 1.0. represents the three facets: gender wage gap, occupational and educational aspirations, and educational performance. The other blocks and the arrows present the elements linking these facets and the relationships between all elements. Each section focusses on one aspect and presents the factors affecting these aspects. The relationships between the variables are also detailed. The last section formulates the hypotheses.

Figure 1.0. Representation of the different facets of my thesis and the relationships between them



1.1 OCCUPATIONAL AND EDUCATIONAL ASPIRATIONS

This subsection is dedicated to the core of my thesis. The first part considers the measurement of the level of aspiration. The second part explains why aspirations matter. Then the third and the fourth parts speak about the determinants of aspirations. The third part details general determinants whereas the fourth part focuses on gender-related determinants.

1.1.1 Measurement of the level of aspirations

In order to measure the level of occupations, the two most common methods are based on the required level of education by the employers and the prestige (Miller & Haller, 1963; Beal & Crockett, 2010). In terms of empirics, the scale based on the prestige is much more used. It actually makes sense as educational aspirations are often measured simultaneously. The first scale of this type dates of 1963. It was based on NORC (National Opinion Research Centre) occupational prestige scores and attributed one score to each occupation such that the higher the score, the more prestigious the occupation (Miller & Haller, 1963).

More recently, the scale ISCO (International Standard Classification of Occupations) was developed by the International Labour Organization. It is the scale used by PISA to code answers of the students to occupational aspirations questions. The classification is based on similarity in terms of the tasks and duties undertaken for the different occupations. The aim of this classification is not to reflect prestige, but it does so because tasks and duties are related to power which is connected to prestige (Ganzeboom, De Graaf, & Treiman, 1992; International Labour Organization, 2016). Here the matter is only to understand how the level of aspiration is measured. For readers interested in the scales, they are available in the paper referenced. For all results about the determinants of the level of aspiration, the scale used is founded on the level of prestige.

Concerning the reliability of these scales, it has been proven empirically that they are reliable. Indeed, surveys on different groups of individuals have shown that classification is aligned on the vision of individuals in terms of prestige for different occupations. However, reliability is higher for men than women (Miller & Haller, 1964; Otto, Haller, Meier, & Ohlendorf, 1974). It is true for all occupational scales based on prestige. In general, they provide robust results. To study occupational aspirations, it is inevitable to build a scale and to classify the different occupations (Miller & Haller, 1963). Hence, the judgement is inevitable in classifying occupations. Therefore, the scales are often based on criteria that may differ from one individual to the other (Haller & Virkler, 1993).

It is also important to notice that lower aspirations are not by themselves negative. The labour market does not produce unlimited numbers of high-prestige occupations. Moreover, lower aspirations may reflect the interests, skills, and abilities of the individuals (Brown & Lent, 2004). As mentioned above, it is necessary to classify but the prestige is not a perfect measure of the level of aspiration. Also, the prestige mainly considers material elements and therefore, it does not reflect the happiness of individuals (Brown & Lent, 2004). An individual may be totally happy in a low-prestige occupation. Here, our source of concern is the barriers that students face when forming aspirations.

There are two types of aspirations: realistic aspirations and idealistic aspirations. On the one hand, the realistic aspirations are about what the individuals want to do considering what is actually possible. They depend on the situation of the students and what students expect to achieve both in terms of education and occupation. On the other hand, the idealistic aspirations concern what the individuals would want to do in an ideal world. It is less anchored in reality and reflects the dream job of the individual. It abstracts from all barriers related to the students and their environment (Miller & Haller, 1963).

1.1.2 Importance of aspirations

The reason why aspirations are important is that there is a consensus on the fact that there is a strong correlation between occupational aspirations and actual occupations in the future (Miller & Haller, 1963; Brown & Lent, 2004; Beal & Crockett, 2010; Gianettoni & Guilley, 2015). Moreover, the level of occupational aspiration is positively related to occupational achievement in later life (Miller & Haller, 1963). Furthermore, it is possible to affirm that the level of aspiration predicts career achievement (Cochran, Wang, Stevenson, Johnson, & Crews, 2011; Gianettoni & Guilley, 2015).

In addition to their impact on occupation in the future, aspirations directly explain educational attainment (Haller & Butterworth, 1960; Powers & Wojtkiewicz, 2004). The relationship between educational and occupational aspirations goes in two directions. Indeed, occupational aspirations determine educational aspirations, as the level of educational aspirations is aligned on the level necessary to reach occupational aspirations (Brown & Lent, 2004), but educational aspirations also predict occupational aspirations (Furlong & Biggart, 2006). Therefore, occupational aspirations are an education policy concern (Archer, DeWitt, & Wong, 2013).

Empirics prove that aspirations are relatively stable over time from 15 years onwards (Brown & Lent, 2004; Beal & Crockett, 2010). Although first aspirations form at a relatively early age (Furlong & Biggart, 2006), the age matters for the stability of the aspirations (Haller, Otto, Meier, & Ohlendorf, 1974). The unemployment during the first year after the end of studies is one of the only factor able to change aspirations (Empson-Warner & Krahn, 1992). And even when aspirations are not aligned on actual occupation, if aspirations were sex-typical, the actual occupation is too (Garcia de Polavieja & Lucinda Platt, 2014).

1.1.3 General determinants of the level of aspirations

In the following paragraphs, we only observe a correlation and not causality. When I mention that one factor has an effect or plays a role in aspirations, I refer to relationships between the variables which are only correlations.

The first group of determinants is related to individual elements that depend primarily on the student. Without any surprise, the level of occupational aspirations is connected to **success in school**. More precisely, it is associated with school grades, participation to scholar activities and the number of expected years of schooling. The level of aspirations is not only correlated with current success but also with the desire for success for the future (Miller & Haller, 1963). Following the same idea, the self-perception of abilities matters almost as much as abilities (Dupont, Monseur, Lafontaine, & Fragnant, 2012).

Regarding only success in school in terms of **performance**, the level of performance is positively correlated with the level of occupational aspirations (Dupriez, Monseur, & Van Campenhoudt, 2012). Therefore, the performance of students at school is important (Gemici, Bednarz, Karmel, & Lim, 2014). Similarly, the more intelligent the students, the higher their level of occupational aspirations (Miller & Haller, 1963; Sellers, Satcher, & Comas, 1999). The intelligence not only influences the formation of aspirations but it also predicts career achievement in later life (Cochran, Wang, Stevenson, Johnson, & Crews, 2011).

To finish with individual factors, there are still two elements to consider. Firstly, as **extracurricular activities** contribute to the identity of the students and help him to define his future, they play a role in aspirations too (Sellers, Satcher, & Comas, 1999; Beal & Crockett, 2010). For example, we can think about the fact that girls typically make dance or music, which stimulate creativity and strengthen the idea that girls are delicate. While, boys tend to play football or basketball, which stimulate competitiveness. Most often, children are free to choose their extracurricular activities or at least free to continue them or not. Secondly, there is a strong negative relationship between the level of aspirations and delinquency (Beal & Crockett, 2010). Although **delinquency** is related to the environment of the student as well, it can be considered as an individual factor because it is chosen by the student.

The second group of determinants is connected to socioeconomic elements. Most of the papers mention the role of the **socioeconomic status** of the students on the level of aspirations. Whatever the sample, the time or the characteristics of the sample, they all agree on the positive correlation between the socioeconomic status and the level of aspirations (Haller, Otto, Meier, & Ohlendorf, 1974; Furlong & Biggart, 2006; Cochran, Wang, Stevenson, Johnson, & Crews, 2011; Rowan-Kenyon, Perna, & Swan, 2011; Dupriez, Monseur, & Van Campenhoudt, 2012; Archer, DeWitt, & Wong, 2013; Gemici, Bednarz, Karmel, & Lim, 2014).

One component of the socioeconomic status is the social class. The higher the social class of the parents and the students, the higher the level of occupational aspirations. More precisely, it is the income and the financial support of parents that matter the most (Miller & Haller, 1963). However, lower classes aspire to get ahead but at a status level lower than the upper classes (Empey, 1956). Moreover, the more difficult social mobility, the more important the social class. Similarly, the larger the inequality, the more important the socioeconomic status (Haller & Virkler, 1993).

The third group of determinants is linked to the environment of the students. The closest environment of a child is composed of his **parents**. The expected level of occupational aspirations from parents for their children is an important factor for the formation of aspirations for children (Miller & Haller, 1963; Haller & Virkler, 1993; Rowan-Kenyon, Perna, & Swan, 2011; Gemici, Bednarz, Karmel, & Lim, 2014). Parental pressure is starting from the beginning of the school career and deeply affect children and their choices (Kahl, 1953).

Concerning parents' **expectations**, they depend on the parental level of education. This level also determined their degree of involvement in academic endeavours. The **involvement** of parents is positively connected with the level of aspirations (Kirk, Lewis-Moss, Nilsen, & Colvin, 2011; Gianettoni & Guilley, 2015). The parents play a very important role in

achievement-related values and consequently in aspirations (Jodl, Michael, Malanchuk, Eccles, & Sameroff, 2003).

Besides the impact of their expectations, the parents affect children via their behaviour and their attitude. When parents are unfamiliar with college requirements, express concern about college affordability or have limited awareness of financial aid opportunities, it lowers the aspirations of their children (Kirk, Lewis-Moss, Nilsen, & Colvin, 2011). The parents' **occupations** and **level of education** matter as well. For mother, it is her occupation that plays a role while for father it is his level of education that matters for the formation of children's aspirations (Burlin, 1976).

Concerning parents, two other factors are important. First, parental sex-typical behaviours, from which children learn which occupations are appropriate for each sex (Garcia de Polavieja & Lucinda Platt, 2014). If parents are sexist or have sexist ideas, children choose gender-typical occupations (Gianettoni & Guilley, 2015). If a student's **mother** has an equal or higher occupational status than a student's father, children are more likely to choose occupations in a less gender-stereotyped way (Gianettoni & Guilley, 2015). Here, occupational status refers to prestige.

Second, parental socioeconomic resources, which affects occupational ambition of the children (Garcia de Polavieja & Lucinda Platt, 2014). The students whose parents have a low income aspire to social and investigative type occupations (Watson, McMahon, Foxcroft, & Els, 2010). Regarding family-related factor, the position in the family is important. Indeed, the first child has often higher aspirations than the following ones. It is more important in low-income families (Sewell, Haller, & Straus, 1957).

More generally, all "significant others" have an impact on the level of aspirations, both by their expectations and their behaviour (Cobb, McIntre, & Pratt, 1989; Murdoch, et al., 2010; Gemici, Bednarz, Karmel, & Lim, 2014). Indeed, there are different spheres of influence. We can consider family but also the school, hobbies, and television (Archer, DeWitt, & Wong, 2013). In order to form expectations, students need information. When they lack information because they have no access to role models or no awareness of the different jobs, they choose lower aspirations (Murdoch, et al., 2010).

The next level in the environment of the student is the **school**. Although the **size** and the **location** of the school are important for the level of aspirations, their effect is weaker than the effect of the socioeconomic status (Haas, 1992). Besides the size and the location of the school, the level of **resource** of the school matters as well (Rowan-Kenyon, Perna, & Swan, 2011). Moreover, the **quality** of the teachers and the **encouragement** of the teachers lead to higher aspirations (Murdoch, et al., 2010).

Specifically, the scholar environment at kindergarten is the most important for the development of aspirations. It confirms that the process of formation of the aspirations starts at an early age (Rowan-Kenyon, Perna, & Swan, 2011). Nevertheless, the school continues to import later on. Indeed, controlling for other factors, students who attend a school **attentive to the transition**, from secondary to university, aspire to go to university twice as much as other students (Draelants, 2013).

In the scholar context, the **peer effect** is extremely important for aspirations. In this case, the peers are the students of the same school or the same class (Haller, Otto, Meier, & Ohlendorf, 1974; Gemici, Bednarz, Karmel, & Lim, 2014). Empirically, the level of aspirations is strongly and positively correlated with the aspirations and the success of the peer group (Miller & Haller, 1963). Precisely, the peer effect is very important with chosen friends as students identify more easily with them (Haller & Butterworth, 1960).

Another factor that concerns both school and parents is **education**. The process of socialization of the students is key to determine its identity and form aspirations. (Haller & Butterworth, 1960; Haller & Virkler, 1993). The socialization affects the way students identify with occupations and whether they believe that they can succeed in reaching this occupation (Barbulescu & Bidwell, 2013). It also defines their social identity which also plays a role in the formation of aspirations (Cochran, Wang, Stevenson, Johnson, & Crews, 2011). Socialization tends to reinforce existing sex roles and stereotypes (Fottler & Bain, 2017).

Concerning the development of occupational aspirations, four phases have been identified. First, between 3 and 5 years, children orient to size and power. Second, between, 6 and 8 years, children orient to sex roles. Third, between 9 and 13 years, children orient to social valuation based on socioeconomic status and social class. Finally, above 14 years, adolescents orient to self (Sellers, Satcher, & Comas, 1999). Therefore, there is a consensus among researchers on the fact that raising aspirations should start from elementary school onwards (Haas, 1992 (Brown & Lent, 2004).

Surprisingly, the less happy the **childhood**, the higher the level of aspirations of the students. It may be explained by the fact that the insecurity due to unhappy childhood leads to the need and search of power, recognition, and success. We can also notice that this factor is particularly striking for girls. There is more upward mobility for girls with an unhappy childhood (Dynes, Clarke, & Dinitz, 1956). An unhappy childhood also strengthens the desire for independence. Hence, the level of aspirations is strongly and positively correlated with the desire for independence (Miller & Haller, 1963).

In countries where there are more possibilities in terms of **school paths**, low-income students are less likely to go to university. It strengthens segregation, differentiation, and inequalities. The main source of concern is that students are influenced by peers, hence, the group of peers is more homogenous in this case (Dupriez, Monseur, & Van Campenhoudt, 2012). The type of education affects aspirations (Dupont & Lafontaine, 2017). Similarly, female students are more affected by gender-stereotype in single-sex schools. It affects the construction of their femininity and identity (Francis, Hutchings, Archer, & Ameling, 2003).

The following level in the environment of the student is his belonging to a **minority**. Students coming from minority groups are more likely to have a lower level of occupational aspirations (Miller & Haller, 1963). Among others, ethnicity may have an impact on aspirations (Archer, DeWitt, & Wong, 2013). Students with an **immigration** background are most often part of a minority. They tend to have lower aspirations and this effect is stronger if they do not speak correctly the national **language** of the country (Gemici, Bednarz, Karmel, & Lim, 2014).

Nevertheless, controlling for social status, migrants tend to have higher aspirations than native (Brinbaum & Kieffer, 2007). It seems, therefore, that the immigration background is correlated with lower social status and that lower aspirations are due essentially to this social status. Besides migration and more generally, the race is an important factor whatever if the student is directly a migrant, has an immigration background or is considered as a “pure” native because his grandparents were already born in the country (McNair & Brown, 1983).

The subsequent level in the environment of the student is whether he lives in a **rural** or urban area. Youths living in rural areas have lower educational and occupational aspirations. There are two direct explanations for this phenomenon. On the one hand, the socioeconomic status of rural youths is often lower than that of urban youths. Specifically, they are more likely to be poor. On the other hand, youths tend to aspire to occupations they know. Naturally, rural students aspire to common jobs in their area (Cobb, McIntre, & Pratt, 1989; Haas, 1992; Haller & Virkler, 1993; Furlong & Biggart, 2006).

In the case of rural youth, lower educational aspirations are characterized by no willingness for post-secondary education (Cobb, McIntre, & Pratt, 1989). There exist other explanations to the urban-rural differential in aspirations. Rural youths have reduced access to higher education and various curricula. They are also less exposed to the world of occupations and they have few role models (Apostal & Bilden, 1991). Hopefully, over time we observe a convergence of rural and urban youths in terms of aspirations (Apostal & Bilden, 1991).

The last level in the environment of the student is the **society**. The federal and **state policy** contexts are particularly important. It includes mainly policies on gender-inequality (Rowan-Kenyon, Perna, & Swan, 2011). The societal cultural **values** are important too (Fottler & Bain, 2017). The economic environment is important but it is less a source of concern in the formation of aspirations than sociological determinants (Andres, Anisef, Krahn, Looker, & Thiessen, 2012). The social pressures have an important impact on students’ aspirations. Indeed, adolescents are affected by what society prescribes in terms of aspirations.

Nevertheless, when students have a stronger personality, the impact is weaker. In this case, having a strong personality means being more willing to act independently (Miller & Haller, 1963). Also, the higher social support for gender-equality, the higher the level of occupational aspirations for women (Fort & Murariu, 2018). Finally, the level of aspirations is strongly and positively correlated with the level of aspirations and success of people with similar characteristics at a high level (Miller & Haller, 1963). Children are also influenced by people they know, television, movies, and radio (Liben, Bigler, & Krogh, 2002).

Concerning an important component of the cultural situation of the society, the language plays a role in the aspirations. More precisely it is significant for gendered occupational aspirations. There exists a theory that states that language sustains occupational stereotypes. It has been shown that the fact that job titles are gender-neutral or gender-specific influences children from a young age onwards. This process is totally unconscious but important in a series of languages (Liben, Bigler, & Krogh, 2002).

Another factor that is related to individual, environmental, and socioeconomic elements is **access to university**. If students feel that access to university is difficult, in the sense that

finance, preparation and application process are inaccessible, they tend to form lower aspirations (Rowan-Kenyon, Perna, & Swan, 2011). It confirms that the commitment from the community is important for aspirations. We can think about access to scholarships or work opportunities (Haas, 1992).

1.1.4 Gender-related determinants of the level of aspirations

Intuitively, the occupational segregation that we observe comes from the segregation of occupational aspirations. There is a strong persistence of the reproduction of gender roles and gender division of labour. Women are overrepresented in low-income and low-prestige jobs. While, men are overrepresented in technical, high-prestige and high-income jobs (Gianettoni, Carvalho Arruda, Gauthier, Gross, & Joye, 2015). Moreover, men are overrepresented in technical and engineering jobs while women are overrepresented in health, social and education sectors (Joye, et al., 2014). Finally, women concentrate in certain areas of competence and have difficulties to access the most prestigious and best-paid positions (Gianettoni & Guilley, 2015).

Furthermore, boys and girls aspire essentially to jobs mainly carried on by people of the same sex. Therefore, the sources of inequalities persist (Gianettoni, Carvalho Arruda, Gauthier, Gross, & Joye, 2015). Also, girls anticipate this future and choose occupations that are realistic. Therefore, the sexual division of aspirations is at the heart of the construction of gender inequalities. Indeed, it lays foundations for vertical and horizontal segregation of the labour market (Gianettoni & Guilley, 2015). Gender predicts aspirations but also career achievement in later life (Cochran, Wang, Stevenson, Johnson, & Crews, 2011).

Some studies do not find any statistically significant difference between girls and boys on their occupational aspirations (Cochran, Wang, Stevenson, Johnson, & Crews, 2011; Dupont, Monseur, Lafontaine, & Fragnant, 2012). While others find that gender has a significant impact on aspirations and women have lower aspirations (Marini & Greeberger, 1978; Furlong & Biggart, 2006; Archer, DeWitt, & Wong, 2013; Barbulescu & Bidwell, 2013; Gemici, Bednarz, Karmel, & Lim, 2014). It seems that males have higher occupational aspirations, whereas females have lower ones and easily accept the status quo (Hogg, Abrams, & Patel, 1987).

Hopefully, the level of aspirations for women is rising but still lower than the level for men (Andres, Anisef, Krahn, Looker, & Thiessen, 2012). Indeed, girls are more and more academically focused and ambitious for their future occupations but there is still dichotomy in types of occupational aspirations chosen by girls and boys (Francis, Hutchings, Archer, & Ameling, 2003). Therefore, there is a catching up in aspirations by gender. This change is more important when parents are highly educated and is mainly due to cultural changes (Shu & Marini, 1998).

The first determinant of gender differential in the level of aspirations is the actual situation on the **labour market**. The occupational segregation maintains gender stratification by affecting aspirations. Both gender segregation across and within occupations affect the choice of women and men in terms of aspirations (Aisenbrey & Brückner, 2008). Therefore, the occupational aspirations held by adolescents are highly sex-differentiated because they follow the pattern of sexual segregation in the labour market (Marini & Greeberger, 1978). Women are constrained by a gendered system (Aisenbrey & Brückner, 2008).

Concerning within occupations gender segregation, the societal sex role, stereotypes, and attitudes towards competency in women imply that it is less likely for women to engage in achievement-directed behaviour necessary to ensure her promotion into managerial positions (O'Leary, 1974). Moreover, the higher the gender wage gap, the more likely aspirations are gender-stereotyped (Aisenbrey & Brückner, 2008). For girls, the gender division of aspirations is related to anticipation of their opportunities in the labour market (Gianettoni, Carvalho Arruda, Gauthier, Gross, & Joye, 2015).

Although the perception of **opportunities** predicts aspirations for both males and females, the effect is stronger for females (Wall, Covell, & MacIntyre, 1999). Definitely, women are more attentive to opportunity (Sellers, Satcher, & Comas, 1999; Rowan-Kenyon, Perna, & Swan, 2011). Moreover, women anticipate more barriers to their career advancement than men. The role of perceived barriers is, therefore, more important for women than men (Watts, Frame, Moffett, Van Hein, & Hein, 2014; Fort & Murariu, 2018). Also, for girls, peer, family and teacher support predict the perception of opportunities, whereas for boys only family support is predictive of this perception (Wall, Covell, & MacIntyre, 1999).

Although the **feasibility** of the aspirations and the judgements of feasibility matter for all individuals, they are particularly important for the formation of aspirations for women (Hart, 2016). Therefore, girls are more likely to make a compromise. They are more likely to give up their ideal aspiration for a realistic one (Brown & Lent, 2004). Girls are also more likely to give up their interest and the prestige level when they compromise aspirations (Brown & Lent, 2004).

Regarding the difference between idealistic and realistic aspirations, the discrepancy between the prestige of realistic and idealistic aspirations is greater for girls than boys. Moreover, girls are more likely to aspire idealistically to male-dominated occupations than to aspire realistically to them (Burlin, 1976; Marini & Greeberger, 1978). Both girls and boys indicate a greater gap between realistic and idealistic occupational aspirations than between realistic and idealistic educational aspirations (Wall, Covell, & MacIntyre, 1999).

The second determinant of gender differential in the level of aspirations is **gender stereotypes**. Occupational aspirations are strongly dependent on gender stereotypes. They can be defined as a collection of socially shared beliefs about specific character traits for boys and girls (Joye, et al., 2014). The female gender stereotypes are incompatible with stereotypes about high-status occupational roles. Women are also perceived as lacking the qualities needed to be successful scientists (Correll, 2004). Gender influence is very important for specific occupational aspirations (Andres, Anisef, Krahn, Looker, & Thiessen, 2012).

According to stereotypic beliefs, girls are more selfless and concern with others and less self-assertive and motivated to master than boys. These beliefs influence and constrain girls and boys such that girls are more likely to hold positions of lower authority and status and to be homemakers (Eagly & Steffen, 1984). In this context, the sexist ideology, the inequalitarian repartition of housework and the gendered choice of hobbies have an important influence on the formation of aspirations because they reflect gender stereotypes (Joye, et al., 2014).

The third determinant of gender differential in the level of aspirations is related to stereotypes and comes from **gender-typical occupations**. Typically, boys aspire to traditionally male-sex-typed occupations while girls are significantly more likely to choose female-stereotyped occupations than male occupations. Girls have a wider range of aspirations than boys and their aspirations are higher in educational status (Trice & Rush, 1995). Boys are less likely than girls to aspire to jobs that are mainly worked by the opposite sex, but they are more likely to actually get those types of jobs (Gianettoni, Simon-Vermot, & Gauthier, 2010).

Additionally, for girls, having an atypical job means breaking the gender norms, while, for boys, it means reinforcing them (Gianettoni, Simon-Vermot, & Gauthier, 2010). Both girls and boys with high self-esteem and girls with high motivation are less likely to aspire to sex-typical aspirations (Garcia de Polavieja & Lucinda Platt, 2014). Therefore, the phenomenon of circumscription of aspirations is more likely for female students. It consists of narrowing occupation options by comparing self-image to images of possible occupations (Brown & Lent, 2004). It has been shown that many adolescents unnecessarily limit their occupational options by ruling out a career they might find interesting and perform well (Gottfredson & Lapan, 1997).

The fourth determinant of gender differential in the level of aspirations is the **return on human capital**. It is important to clarify that the fact that women have lower aspirations is not due to their ability, at the contrary (Frome, Alfeld, Eccles, & Barber, 2007). Indeed, the choice for more prestigious occupations by boys cannot be explained by their superior academic ability as boys and girls display similar levels of academic ability (Buser, Niederle, & Oosterbeek, 2014). Consequently, most women aspire to high school graduation. Nevertheless, relative to men they are less likely to expect college graduation (Powers & Wojtkiewicz, 2004).

Inevitably, there are differences between boys and girls but not in the level of ability. However, the return on human capital is on average lower for women (Aisenbrey & Brückner, 2008). At equal number of years of schooling, the income for female professions is lower and the opportunities of career progression are more limited. Women are also more likely to work part-time (Joye, et al., 2014). Moreover, the impact of socioeconomic status and academic achievement is greater for boys than girls (Marini & Greeberger, 1978).

The fifth determinant of gender differential in the level of aspirations is the **self-concept**. In general, men make higher valuations of their own mathematical ability which contributes to the fact that they are more likely to persist on paths to careers in science, mathematics and engineering (Correll, 2004). Typically, men have better self-concept than women. They even tend to be overconfident (McNair & Brown, 1983). Therefore, men and women form different aspirations because they make different valuations of their own ability at career-relevant tasks (Correll, 2004).

Concretely, the self-conception of the students is key in defining their aspirations (Miller & Haller, 1963). In this context, a student with less self-confidence typically chooses a lower level of aspirations (Cobb, McIntre, & Pratt, 1989). Women have a higher **fear of failure**, lower self-esteem, and aversion to conflict (O'Leary, 1974). Gender differences in terms of overconfidence and **competitiveness** explain almost one-fifth of the gender gap in aspirations

(Reuben, Wiswall, & Zafar, 2017). And the competitiveness is strongly positively correlated to aspirations for more prestigious occupations, even conditional on academic ability (Buser, Niederle, & Oosterbeek, 2014).

The sixth determinant of gender differential in the level of aspirations is the gender-differentiated impact of **children** on career choice and career development. Women are more likely to take into account the impact of a career on family life and to aspire to jobs with better work-life balance (Barbulescu & Bidwell, 2013; Fottler & Bain, 2017). Therefore, they have a higher desire for flexible jobs that allow combining family and career. Their intrinsic value for science-related domains is low (Frome, Alfeld, Eccles, & Barber, 2007). It is directly related to gender stereotypes concerning the family organisation.

Also, women who have male jobs are less focused on domestic matters than other women (Gianettoni, Simon-Vermot, & Gauthier, 2010; Fottler & Bain, 2017). The gender division of aspirations, for girls, is therefore related to the difficulties to combine professional and family lives. The negative impact of children in the career choice of women reduces over time but still exists. Besides, the career choice the balance family-career continues to impact women's career over the whole career of women (Gianettoni, Carvalho Arruda, Gauthier, Gross, & Joye, 2015).

The seventh determinant of gender differential in the level of aspirations is the **preferences** of women. They have higher social preferences, higher **risk aversion** and lower preferences for competition (Croson & Gneezy, 2009). Moreover, female students are more attentive to meaning at work than their males' counterpart. This difference is universal and becomes more pronounced with greater economic development. It explains both aspirations for sectors and placement in the hierarchy (Burbano, Nicolas, & Meier, 2020). Finally, the wanted or expected quality of life is higher for women and significantly and positively affects aspirations (Cobb, McIntre, & Pratt, 1989).

The last determinant of gender differential in the level of aspirations is the **indecision** of women. Women experience a lack of person-occupation fit. It generates vocational indecision and reduces career motivation (Haller, Otto, Meier, & Ohlendorf, 1974; Fort & Murariu, 2018). It has consequences for aspirations but also in the future. Indeed, due to the uncertainty in aspirations, individuals face aimlessness therefore, they prolong education, are residential dependent and change frequently of job. It results in lower wages in adulthood (Staff, Harris, Sabates, & Briddell, 2010).

1.2 GENDER WAGE GAP

Before being able to go further into the literature review on the gender wage gap, I have to clarify the meaning of the gender wage gap. The OECD proposes a definition that is both simple and eloquent by defining the gender wage gap as the discrepancy between median earnings of male and female workers relative to median earnings of male workers (OECD, n.d.). The Treaty of Rome in 1957 goes a little bit further with the equal pay for equal work principle. It implies that women should be paid the same as men for the same work (European Parliament, 2020). Some causes of the gender wage gap do not apply to both definitions. Box 1 clarifies terms and the differences between the gender wage gap and discrimination.

Box 1. Clarifications on the gender wage gap and gender discrimination

The gender wage gap implies that one gender has lower pay than another gender. Most often, the gap is in favour of men.

The gender discrimination implies that equal labour services provided by equally productive workers have a sustained wage difference because of gender. We can distinguish pure discrimination and statistical discrimination.

- Pure discrimination is not based on any other factor than the gender of the individual.
- Statistical discrimination is based on statistics on the productivity of women relative to men.

For public authorities, the gender wage gap is a source of concern because it is one crucial source of discrimination that modern society is experiencing. It is particularly important to distinguish the sociologic approach from the economic approach. For sociologists, the fact that men have a higher wage than women is sufficient to diagnose gender wage discrimination. For economists, a misalignment of productivity and wage is necessary to consider discrimination. The problem is therefore when there are no reasons for the gender wage gap because men and women present the same characteristics.

Nevertheless, equal pay is not just about justice. It is also about economic empowerment for women. It would give more to women that would be able to spend more, invest more and save more. The tax base would be increased and the risk of poverty and social exclusion at an older age for women would be reduced. Both relieving some of the burdens on welfare systems financed by taxation. Therefore, reducing the gender pay gap could be beneficial both for individuals and for society in general. Empirical studies estimate that lowering the gender wage gap by one percentage point would improve the GDP by 0.1% (European Parliament, 2020).

1.2.1 General causes of the gender wage gap

Among the various explanations of the gender wage gap, it seems that traditional human capital variables taken together account for little of the gender wage gap. Moreover, the importance of human-capital factors is decreasing over time (Blau & Kahn, 2017). Despite this limited role of human capital in the gender wage gap, the level of education matters. It is clear that the gender wage gap decreases with education. Education decreases inequalities among genders (Beblo, Beninger, Heinze, & Laisney).

This is especially true for women that are low educated and at the bottom of the wage distribution. Women are particularly penalized when they are low educated (Mussida & Picchio, 2014). In particular, workers with a low level of skills and with little labour experience have a serious selection disadvantage. Therefore, they often have to accept atypical forms of employment. By atypical jobs, we mean part-time jobs concentrated in the secondary segment of the labour market and offering low pay. It is known that women tend to be overrepresented in these jobs (Jepsen, O'Dorchai, Plasman, & Rycx).

Nowadays, career breaks and part-time work stay common for women. It is, even more, the case for high-skilled occupations (Blau & Kahn, 2017). The reason is that part-time employment is often presented as an ideal solution to combine family and professional responsibilities. Hence, women remain the main caregivers and merely in charge of housework.

But part-time work has many weaknesses. First, it induces a wage penalty. Second, human capital is less rewarded in part-time than in full-time employment. It has been shown that working part-time has a negative effect on current wages only for part-time with less than 16 hours per week. However, hourly wage disadvantage accumulates over time whatever if the part-time is longer or shorter than 16 hours. Moreover, working part-time today makes more likely to work part-time in the future which amplifies the wage disadvantage. The effect of a career break is even more negative than the effect of part-time work on wage (Jepsen, O'Dorchai, Plasman, & Rycx; Paul, 2016).

In general, women do more hours of unpaid work by caring for children or doing housework while men do more hours of paid work (European Parliament , 2020). Therefore, women are less likely than men to participate in the labour force and less likely to work full-time. By averaging fewer hours of paid work per week and fewer weeks per year, women widen the gender wage gap (Reskin & Bielby, 2005). Nevertheless, in total, women have more work hours per week than men but a nonnegligible share of them are unpaid (European Parliament , 2020).

For the same reasons, women are more likely to have career breaks. They are also more influenced by family responsibilities in career choices. Even today, it is often the women who sacrifice her career for family life. Another risk related to children is maternity leave. Indeed, there still exists a high risk for women to be demoted after returning from maternity leave. The longer the leave, the higher the risk. Even if it is prohibited by law, many women are fired for this reason but on other grounds (European Parliament , 2020).

For most countries, we observe two phenomena. The first one, the sticky floor describes a discriminatory employment model that keeps women at the bottom of the job scale. It implies that the wage differential is wider at the bottom of the wage distribution. The second one, the glass ceiling describes a discriminatory barrier which prevents the advancement of women who already hold relatively good jobs. It means that differential is also wider at the top of the distribution (Christofides, Polycarpou, & Vrachimis, 2013). As the width of the gap is larger at the top than at the bottom of the pay distribution, it suggests that women have more disadvantage in better jobs and the second phenomenon is stronger than the first one (Christofides, Polycarpou, & Vrachimis, 2013). The labour market mobility of women is consequently lower relative to men (Morchio & Moser, 2019).

Over time, the gender pay gap is declining but it does so much more slowly at the top of the wage distribution than at the bottom or the middle. Consequently, it stays noticeably higher at the top. It strengthens the glass ceilings phenomenon (Blau & Kahn, 2017). Moreover, the role of experience is much more important in explaining the gender wage gap at the top of the wage distribution. Hence, women tend to accumulate less experience than men at the same age. It is partly due to family responsibilities and their consequences on women's career, that I evoked above (Baron & Cobb-Clark, 2010).

It is clearly documented by research that organisations benefit from gender diversity at all levels (Carter, Simkins, & Simpson, 2003). But, gender differences in career development persist (Ellemers, 2014). Indeed, men are more likely to be at the top of the hierarchy. It often involves higher wages (Aláez-Aller, Longás-García, & Ullibarri-Arce, 2011). They are more likely to

supervise workers of the other sex and to dominate the top positions in their firm (Reskin & Bielby, 2005). Even when they are at the top of the hierarchy, women earn less than men at the same level (European Parliament , 2020).

Several factors combined can explain the dominance of men at the top of the hierarchy and therefore, the vertical gender segregation of the labour market. First, the glass ceilings effects make career development more inaccessible and therefore less attractive for women. Second, the Queen Bee effects avert female workers at high levels of leadership from acting as role models for other female workers. The Queen bee syndrome describes women in a position of authority who are more critical with subordinates if they are women. Finally, women have to choose between work and family. The success in their professional career and the development of it is at the expense of their family life (Ellemers, 2014).

In econometric analysis, the results may vary with the controls we use. For example, controlling for labour demand and firm wage policy-related effects, the gender wage gap is higher and wage inequality is higher. Therefore, the labour market situation matters for the gender wage gap. It seems that the bargaining power of the employee plays a key role in wage inequality and the gender wage gap. At the contrary, controlling for personal characteristics of the worker tends to reduce wage inequality and the gender wage gap (Antonczyk, Fitzenberg, & Sommerfeld, 2010).

For international comparisons, an important factor to consider is the political and institutional dimension. In this context, we think about countries policies and institutions. Inside a country, institutions and policies related to gender wage equality, or not, play an important and systematic role in explaining the gaps and the differences between the countries. It implies that the importance of the gender wage gap in a country's political agenda is essential. However, it is not enough to put policies in place to observe the expected effects, some policies fail (Christofides, Polycarpou, & Vrachimis, 2013).

For the European Union, it has been shown that the size of the gender wage gap varies considerably across countries, definitions of the gap and selection-correction mechanisms. The selection-correction mechanisms refer to the policies put in place by the country, that were evoked in the previous paragraph. Beside institutions and policies, the definition of the gender gap matters and affects variations of the size of the gender wage gap across countries. The collection of data tends to be uniformized at European level, but the interpretation of this data and the reality they cover may vary (Christofides, Polycarpou, & Vrachimis, 2013).

Besides all factors identified to explain the gender wage gap, wage differentials with no apparent reason represent a nonnegligible part of the gap (Blau & Kahn, 2017). Because women face pure discrimination. They are paid less than men working within the same occupational category (European Parliament , 2020). Indeed, a large part of the current gender wage gap arises within occupations. Female workers also face a more important wage dispersion than male workers (Moore, 2017). We can notice that direct discrimination is more likely at the top of the distribution and rare at the bottom of the wage distribution (Baron & Cobb-Clark, 2010).

We can distinguish two types of discrimination at play in the gender wage gap. First, taste discrimination based on employer's preferences for workers of one sex over the other. Second,

statistical discrimination established on employer's beliefs that workers of one sex or the other are less profitable, less productive or more costly to employ (Reskin & Bielby, 2005). One point of concern here is that research based on empirical pieces of evidence indicates that discrimination is really difficult to reduce (Blau & Kahn, 2017).

1.2.2 Link between the gender wage gap and occupational aspirations

The relationship between these two facets of my thesis lies in the role of occupations in the gender wage gap. Indeed, there is a widespread consensus on the fact that gender differences in occupation and industry are an important factor to explain the gender wage gap. More broadly, differences in gender roles, in occupations and in industries combined with the gender division of labour are key factors (Blau & Kahn, 2017). The wage for the same occupation may vary across industries. Here we consider horizontal segregation of the labour market rather than vertical segregation. It means that we study the gender differences in the occupations and not the level within the occupation.

For the role of the occupational segregation on the gender wage gap, the gender wage gap varies across occupations and because of occupations (Beblo, Beninger, Heinze, & Laisney). Specifically, women are overrepresented in relatively low-paying sectors and underrepresented in science, technology, and engineering sectors (European Parliament, 2020). Firm and occupation-level gender segregation give rise to dissimilar outcomes for men and women, it is at least partly due to the devaluation of predominantly female jobs (Reskin & Bielby, 2005).

In this context, an important fearing fact is the effect of the domination of women for an occupation. There is a clear wage penalty for work in predominantly female occupations. Even if the penalty differs with the level of skills (Hegewisch & Hartmann, 2014). The higher the share of women in an occupation, the lower average earnings for this occupation. It is particularly striking for the most skilled occupations and jobs requiring little formal education and experience. It implies that the likelihood of very low earnings is higher for women working in female-dominated occupations (Hegewish, Liepmann, Hayes, & Hartmann, 2010).

Therefore, the progressive shift of women to new occupations contributes to gender wage convergence. Nevertheless, the wage equalizing effects of occupational diversification diminish over time (Moore, 2017). Besides its impact on the gender wage gap, occupational segregation is a concern to policymakers because it has been shown that it is inefficient economically, to prevent able people to enter occupations where they could perform well and be more satisfied (Hegewish, Liepmann, Hayes, & Hartmann, 2010).

To summarize the consequences of segregation and the impact on society, we can highlight some elements. First, gender segregation on the labour market and education generate and perpetuate gender inequalities in and outside the labour market, by strengthening gender stereotypes. Second, it leads to a higher poverty rate and lower economic independence among women, because of the wage gap it implies. Third, gender segregation acts as a barrier to growing women's labour participation because of lower earnings and career prospects that follow from it. Fourth, it is a source of labour market inefficiency and rigidity because human resources are misused and reactions to changes in the labour market are slower. Finally, it limits

innovative economic growth and the development of a “green” economy (European Institute for Gender Equality, 2017).

For the occupational segregation, within-job discrimination, described at the end of the previous sub-section, is much less essential than occupation-establishment segregation for observed wage discrepancies. Occupational segregation is a more important cause than establishment segregation. Both occupation and establishment sex segregation are widespread (Petersen & Morgan, 1995). The segregation implies that women and men, in general, hold different occupations and work in different industries and firms. It is also called the sexual division of labour by sociologists (Reskin & Bielby, 2005).

As part of establishment segregation, women tend to work in less profitable firms. Given the significant and positive relationship between hourly wages and firm profits-per-employee, a substantial part of the gender pay gap is attributable to this segregation (Rycx & Tojerow, 2004). It is the opportunity to mention that the gender wage gap is less in the public sector (Beblo, Beninger, Heinze, & Laisney). Concretely, men and women are concentrated in different firms or hold a different job within the same firm.

The segregation also arises at the industry-level. Despite control for a large number of productivity-related factors, significant inter-industry wage differentials exist. Up to one-tenth of the overall gender pay discrepancies are due to industry effects (Rycx & Tojerow, 2002). These interindustry wage differentials are significant in all countries and for both sexes, but they fluctuate sharply across countries. Logically, the dispersion of industry effects is larger in countries with decentralised bargaining. Whatever the working conditions, the workers and the firm characteristics, wage differentials persist between workers employed in different sectors (Gannon, Plasman, Rycx, & Tojerow, 2007).

There are several causes to segregation. First, there exists evidence that occupational differences reflect the presence of barriers faced by women (Kidd & Shannon, 1996). Among these barriers, we find implicit bias. It reduces the likelihoods that women will enter and perform well in male-dominated organizations or jobs. It limits women in their choice and causes the persistence of the segregation over time (Ellemers, 2014). In general, men specialize in market work while women specialize in domestic work (Reskin & Bielby, 2005).

Second and more surprisingly, women also suffer from indirect pressures influencing their occupational and industrial distribution. Because of a series of factors, women self-select for particular occupations (Plasman & Sissoko, 2005). Some authors estimate that the self-selection cannot be ignored when we study the gender wage gap (Beblo, Beninger, Heinze, & Laisney). The magnitude and effects of indirect discrimination are more dispersed across countries than direct discrimination (Plasman & Sissoko, 2005).

Third, the research identified psychological variables that are not necessarily innate and may explain the gender segregation on the labour market. Particularly, we have gender differences in competitive behaviour and risk-taking. More generally, we observe the formation of homosocial preferences and gender identity and role (Booth, 2009). Segregation is also explained by the difference in preferences that men and women have. These preferences are not innate neither, individuals develop them (Reskin & Bielby, 2005).

Finally, sex is treated as a piece of relevant information in assigning roles and responsibilities on the labour market. It leads to social differentiation; hence, social differentiation is a precursor for social stratification. It implies systematic inequality in the distribution of socially valued resources – in this case, a job – on the basis of the gender. Moreover, all societies use sex-based inference. They used a biological characteristic to infer personality traits, preferences, and potential. It results in gender stereotypes that are generally known and prescribe appropriate behaviour (Reskin & Bielby, 2005).

Both social differentiation and gender stereotypes lead worker and employer's preferences and practices. At the firm-level, two kinds of employers' decisions matter. On the one hand, hiring decision can influence the sex segregation across firms, when a firm decides not to hire women. It may result in higher unemployment for women and increase the likelihood that women will work at a firm that employs fewer men. On the other hand, job assignments determine the level of sex segregation within the firm (Reskin & Bielby, 2005).

1.2.3 Situation in Europe and Belgium

Based on the literature, we observe a general decline in the gender wage gap between 1980 and 2010 (Blau & Kahn, 2017). Indeed, comparing gender wage differentials between women and men of equal productivity, we see that, over time, raw wage differentials have dropped substantially. However, most of this fall is due to improved labour market endowment of women (Weichselbaumer & Winter-Ebmer, 2005). Concerning trends in overall gender segregation, we observe that after a considerable move towards less segregated occupations in the 1970s and 1980s, progress has completely stagnated since 1990s (Hegewish, Liepmann, Hayes, & Hartmann, 2010).

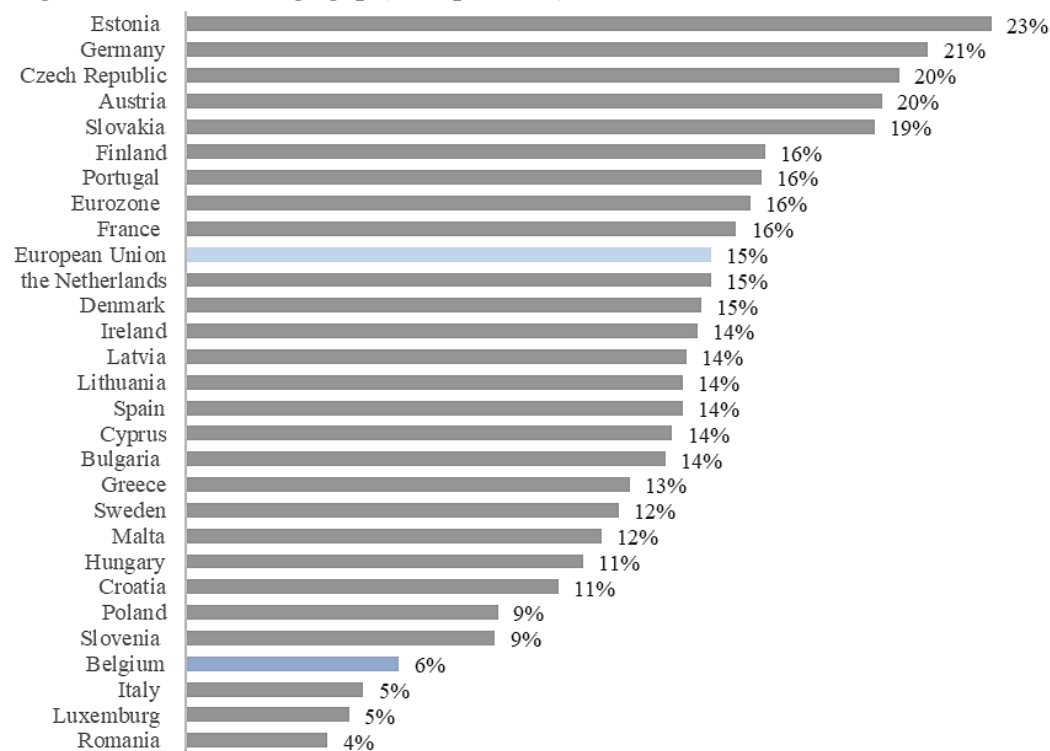
In Europe, the gender wage gap is smaller in Mediterranean countries and higher in Austria, the United Kingdom and Northern European countries. This difference is due to the larger proportion of men at higher-paid levels for the second group of countries. In general, the range of situations is very large (Aláez-Aller, Longás-García, & Ullibarri-Arce, 2011). Nevertheless, Europe seems to follow a declining trend as well. Data on gender segregation at European level are more difficult to find and to use as they are not standardised. The way occupations are segregated varies considerably across countries.

At the Belgian level, comparing direct estimates of a gender productivity differential with those of a gender wage differential, no gender wage discrimination was found inside private firms. It dismisses pure discrimination, but it does mean that there is no gender wage gap (Vandenberghe, 2011). Moreover, gender segregation in occupations and sectors reduce over time, nevertheless, we need more efforts to bring them down. While segregation in sectors has raised by 1.3% between 1999 and 2003, occupational segregation has been stable, both are slightly higher than the European average (Jepsen, O'Dorchai, Plasman, & Rycx).

Based on statistics, we can use data collected at European or Belgian level. From Figure 1.1., we know that the gender wage gap was on average 15% in 2017 and for the members of the European Union. Belgium does much better because the gap was 6% for the same year. The top 5 is composed by Romania (4%), Luxemburg (5%), Italy (5%), Belgium (6%), and Slovenia (9%). The flop 5 is composed by Estonia (23%), Germany (21%), Czech Republic (20%),

Austria (20%), and Slovakia (19%). If we compare Belgium to its border countries, it is doing better than all of them, except Luxemburg.

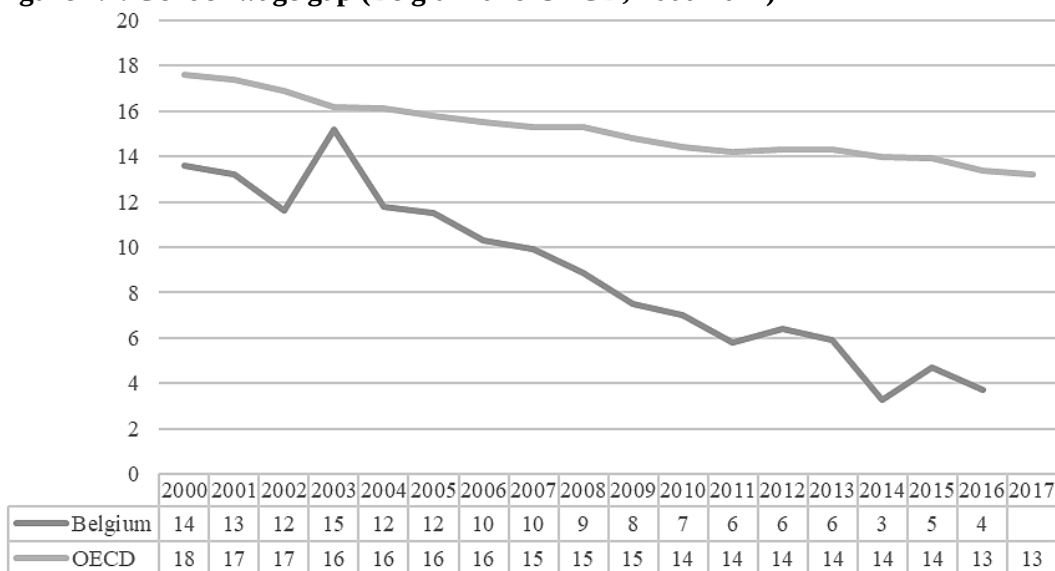
Figure 1.1. Gender wage gap (Europe; 2017)



Notes: Gender wage gap = (hourly wage for men – hourly wage for women)/hourly wage for men.

Source: (STATBEL, 2020)

Figure 1.2. Gender wage gap (Belgium and OECD; 2000-2017)



Notes: The gender wage gap is defined as the difference between the median earnings of men and women relative to median earnings of men. The gender wage gap is expressed in percentage.

Source: (OECD, 2019)

On Figure 1.2., we see the evolution of the gender wage gap in Belgium and for OECD between 2000 and 2017. Both the OECD average and Belgium follow a decreasing trend. Nevertheless,

the trend is stronger in Belgium. The initial level is also lower in Belgium. We have two exceptions in the declining trend for Belgium, in 2003 and 2015. As previously, Belgium is doing good compared to the rest of the world.

Table 1.1. Share of female/male ISCED 5A graduates of all ISCED 5A graduates (Europe; 2015)

	Men	EU min	EU max	Women	EU max	EU min
Education	18%	4%	35%	82%	96%	65%
Health and welfare	24%	11%	42%	76%	89%	58%
Arts and humanities	32%	21%	46%	68%	79%	54%
Social sciences, journalism, and information	32%	22%	47%	68%	78%	53%
Business, administration, and law	40%	27%	53%	60%	73%	47%
Natural sciences, mathematics, and statistics	43%	20%	56%	57%	80%	44%
Agriculture, forestry, fisheries and veterinary	44%	19%	60%	56%	81%	40%
Services	50%	21%	69%	50%	79%	31%
Engineering, manufacturing and construction	72%	59%	85%	28%	41%	15%
Information and communication technologies	79%	61%	92%	21%	39%	8%

Notes: Shaded cells refer to gender-segregated education fields at the EU level. ISCED 5A is equivalent to short-cycle tertiary education in Belgium.

Source: (European Institute for Gender Equality, 2017)

Table 1.1. presents the share of female and male workers in a couple of sectors. We only consider ISCED 5A (which is equivalent to master) graduates because it is where differences are the most important. The dispersion of this share is large across the European Union as the difference between EU max and EU min is at least 25%. We have four sectors that are gender-segregated in favour of women and two sectors that are gender-segregated in favour of men. It is not surprising, intuitively, to find education in the first group and engineering in the second.

Table 1.2. Top 3 of female and male professions (Belgium; 2017-2019)

	Women		Men	
	Profession	Share	Profession	Share
2019	All	46.9%	All	53.1%
	Nursing auxiliary	98%	Mechanic	100%
	Children care	97.9%	Mason	98.9%
	Home help	97.1%	Electrician	98.9%
2018	All	46.8%	All	53.2%
	Home help	97.6%	Mechanic	100%
	Children care	97.5%	Electrician	99.4%
	Early childhood educator	97.2%	Mason	99.3%
2017	All	46.2%	All	53.8%
	Home help	97.5%	Mason	99.8%
	Nursing auxiliary	97.2%	Mechanic	99.6%
	Early childhood educator	96.9%	Truck driver	99.3%

Notes: The figures come from the « Enquête sur les forces de travail ». They are not "absolute" figures, but approximations based on the extrapolation of a random sample of the Belgian population.

Source: (STATBEL, 2020)

Concerning gender segregation in Belgium, Table 1.2. describes the top 3 of female and male professions between 2017 and 2019. To not have segregation, we should have a share of men or women by occupation close to the share of women or men in the population. Here, we are well far from it with shares above 96%. Over time, the top 3 does not move much, both for men and women. As at the European level, the occupations in the top 3 are not surprising.

1.3 EDUCATIONAL PERFORMANCE

In this section, I will look at the sources of differences in educational performances. The first part is dedicated to gender differences which are probably the most interesting ones for us. I detail the differences and the potential explanations to them. While the second part regroups a couple of other well-known sources of differences.

1.3.1 Gender differences

In general, girls have higher school achievement than boys (Weis, Heikamp, & Trommsdorff, 2013). Indeed, girls reach higher grades than boys throughout their school years. This gap has been documented for nearly a century. Although, in overall grades, girls maintain a higher grade average than boys, whatever the subject area, on standardised tests the results are well different (Smith, 2014). For most of the countries that take part in PISA, on average girls underperform boys in mathematics and overperform boys in reading test score (de San Roman & de la Rica, 2012; Brozo, et al., 2014).

To go further on this observation on performance for standardized scores, the differences in grades for girls and boys are largest in reading and smallest in mathematics and science (Smith, 2014). Moreover, boys are better with earth and physical science and they better understand scientific knowledge (Yan Yip, Chiu, & Chu Ho, 2004). Finally, girls tend to outperform boys on items involving calculations and to underperform boys on items requiring spatial ability (Liu, Wilson, & Paek, 2008). As for the evolution of the performance gender gap over time, it is narrowing (Nollenberger, Rodriguez-Planas, & Sevilla, 2016).

Concerning performance in mathematics, biologically speaking, women are as likely as men to have deep mathematical talent (Nollenberger, Rodriguez-Planas, & Sevilla, 2016). Moreover, girls do equally well as boys in mathematics classes, but they are constantly outperformed on standardized mathematics tests. The actual differences in performance are small but always in favour of boys (Liu, Wilson, & Paek, 2008). A general comment is that on standardized tests, the results are usually stereotypical, in the sense that boys score higher in mathematics and science and girls score higher in reading (Smith, 2014).

Regarding gender stereotypes, it has been shown that gender stereotypes impact self-concept and therefore, performance. Indeed, the gender gap in mathematics scores disappears in countries with a more gender-equal culture (Guiso, Monte, Sapienza, & Zingales, 2008). Similarly, the role of cultural beliefs on the role of girls and women in society is important to explain the mathematics gender gap. The cultural beliefs and their transmission account for more than two-thirds of the overall influence of gender-correlated factors (Nollenberger, Rodriguez-Planas, & Sevilla, 2016).

There exists another reason that could explain why girls' grades are higher based on social and cultural factors. Because it is assumed that boys are better at mathematics and science, perhaps

parents encourage girls a bit more often to increase the effort they put into their studies (Smith, 2014). Moreover, there is substantial evidence for the intergenerational transmission of gender role attitudes, especially from mothers to daughters, as the performance of girls – not that of boys, is better in families where the mother works outside home (de San Roman & de la Rica, 2012).

Besides their direct role in performance, stereotypes also reduce identification with school. Hence, sustained school success requires identification with school. Empirics prove that stereotypes and their impact on identification with school can dramatically depress the standardized test performance of girls. They also influence the intellectual identity of girls. When girls are negatively stereotyped in a school domain, their performance may be strongly negatively affected in this domain. It may also contaminate other school domains (Steele, 1997).

Looking at the differential between the performance to standardized tests and the performance in classes, one potential explanation could be that girls perform better on tasks that they are familiar with (Liu, Wilson, & Paek, 2008). Another series of reasons stand in key differences between standardized tests and tests in classes. The grades given in a classroom setting reflect a larger social context and involve long-term persistence. While standardized tests assess basic or specialized academic abilities or aptitudes. Moreover, the skills are being tested at one point in time with no social influences implicated (Smith, 2014).

For the difference in grades per se, part of the difference between boys and girls may be due to the negative attitude of girls towards mathematics and science. The strength of this attitude reinforces over education (Baye, et al., 2004; Felouzis & Charmillot, 2012). Moreover, girls have a bad perception of themselves in mathematics and only 22.7% of this perception is explained by performance (Baye, et al., 2004). Vis-à-vis gender differential in reading scores, most of the inequality in reading are due to learning strategies and reading habits (Felouzis & Charmillot, 2012). While girls are less interested in mathematics, they have a more positive attitude towards school in general (Baye, et al., 2004).

Finally, there exists another difference between girls and boys when they face tests. Besides the analysis of the scores, it is possible to analyse how boys and girls react to different types of question. The results show that the format of the question makes a difference for both genders. It seems that boys are better with closed items, while girls are better at recognizing questions and identifying evidence items. To reach a gender-equitable assessment, we should evaluate diverse content and literacy skills in a diversity of response formats (Yan Yip, Chiu, & Chu Ho, 2004).

1.3.2 Other sources of differences

From a general point of view, there exist multiple sources of differences in performance to tests. They could be related to the students, the family of the students, the school of the student or the country of the student. Therefore, all sources are connected to the student or the environment of the student (Fuchs & Wobmann, 2008). Here I develop the impact of the socioeconomic status, the migratory origins, the culture, and the type and quality of education. I make a detour by the specificity of the system in Belgium to better develop the impact of the types of education on students' performance.

First, the socioeconomic status of the student undeniably matters for school performance. Empirically, it has been proven that a low socioeconomic status has strong negative consequences on PISA results (Baye, et al., 2004). Moreover, the impact of the socio-economic background is stronger when social mobility is less likely (Entorf & Minoiu, 2004). Furthermore, students with a low socioeconomic level tend to live badly the tests and personal questions. It may negatively affect their results to the test (Pereyra, Kotthoff, & Cowen, 2012).

Concretely, it has been shown that between 14.9% and 34.9% of the overall inequalities in education are related to the socioeconomic status of the student. Specifically, we observe socioeconomic-related inequalities in mathematics. The key dimensions of the socioeconomic status in this context are student's background characteristics, access to educational resources and school composition (Martin & Veiga, 2010). It is aligned with other studies that emphasize the role of peer effect (Baye, et al., 2004) and access to educational resources and home inputs (Fuchs & Wobmann, 2008).

In the same way, the socio-professional status index of parents matters. The lower the socio-professional index of parents, the lower the performance to tests (Baye, et al., 2004). More generally, the whole family background is important. The economic, social, and cultural status of the family matters. It is based on the socio-economic index of parents, level of education of parents and familial patrimony index (Fuchs & Wobmann, 2008; Felouzis & Charmillot, 2012). All sociocultural factors are important for the performance of the student (Nollenberger, Rodriguez-Planas, & Sevilla, 2016).

Second, the migrator status is key to explain the performance of children. Indeed, migrants and grandchildren of migrants have lower performance. In the same idea, the language spoken at home has an important impact on performance. Particularly, if this language is not part of the official languages in the country (Baye, et al., 2004; Felouzis & Charmillot, 2012). The language spoken at home is specifically important for catching up for students with a migration background. This status could actually be correlated with the socioeconomic status, but it is not always the case (Entorf & Minoiu, 2004).

Third, culture is important for performance. At the international and intranational levels, most of inter- and intra-country differences are due to cultural differences (Pereyra, Kotthoff, & Cowen, 2012). The differences in culture and social norms across countries and regions within the same country are crucial determinants in understanding differences in PISA. Different elements of the culture may matter. For example, the importance of education, the discipline, the pressure of parents, the importance of success or the prospects of students (de San Roman & de la Rica, 2012).

Lastly, the type and quality of education are well-known factors. This point is particularly important in Belgium because it is a Federal state. Since 1989, several levels of political power have been established. Each level of power is responsible to administer and legislate on matters it has charge of. One way to divide Belgium is language and culture. It results in three communities: the Flemish, the French and the German communities. Another way to split Belgium is geography. In this way, we obtain three regions: the Flemish region, Brussels-

Capital, and Wallonia. Few educational matters are the responsibility of the Federal State because education is mainly defined at the level of the communities (Lafontaine, 2006).

Although the principles remain structurally similar, there are important differences in the ways these education systems are managed (Lafontaine, 2006). More surprisingly, the small size of Belgium does not prevent large disparities between Flemish and Walloon. Indeed, Flemish score higher than Walloon, in all disciplines of PISA. One explanation could be that Walloon are more likely to repeat one year. Hence, it has been shown that students that repeated one year have lower scores (Baye, et al., 2004; Felouzis & Charmillot, 2012). However, a more important explanation is probably that the education systems are different.

For all countries participating at PISA, empirics show that the system of education is strongly correlated with PISA results (Lafontaine, 2006). Particularly, the type of education is important. But, when we control for the socioeconomic status of the students in the school, the difference due to the type of education almost disappears (Baye, et al., 2004; Nollenberger, Rodriguez-Planas, & Sevilla, 2016). Therefore, a large proportion of the effect of the type of education is due to socioeconomic status. Another remark is that when the educational system lacks a core curriculum, the results are more segmented and dispersed (Felouzis & Charmillot, 2012).

There are other factors related to the educational system and that affect performance. It seems that the quality of the institutions matter. This quality is related to the budget dedicated to education, in particular. In the same idea, the quality of the teachers matters. Furthermore, the student-teacher ratio matters. It may impact performance via the quality of the teaching or directly. Finally, the objective of the institutions has an impact on the performance of students to PISA tests. This objective is strongly correlated to the culture of the country (Baye, et al., 2004; Fuchs & Wobmann, 2008).

1.4 HYPOTHESES

For the first part of the research question, the objective is to identify the determinants of educational and occupational aspirations. Table 1.3. regroups the different determinants identified in the literature. For elements in italic, there is no data in the PISA database, or it does not make sense to analyse them as I only consider one country and these elements are not different within the country. Therefore, they are not considered in descriptive and econometric analysis. The first hypothesis can be formulated as:

Hypothesis 1: Elements in Table 1.3. are correlated with the level of educational and occupational aspirations. And beyond the other determinants of Table 1.3., gender-related determinants are correlated with the level of educational and occupational aspirations.

For the second part of the research question, the objective is to determine whether the level of aspirations is aligned on performance and whether the relationship is different by gender. On one side, girls have lower performance in mathematics and higher performance in reading, in standardized tests. On the other side, girls have lower or higher aspirations, depending on the papers. Therefore, there is no consensus on the expected results. The second hypothesis can be formulated as:

Hypothesis 2: The level of aspirations is not aligned on performance to PISA tests and gender makes a difference in the relationship.

In order to test this second hypothesis, I have to check the significance of the relationship between performance and aspirations but also how gender affects this relationship. The easiest way to proceed is to use interaction terms between gender and performances in regressions on educational and occupational aspirations.

Table 1.3. Determinants of aspirations

Individual determinants	- performance - extracurricular activities - <i>delinquency</i>
Socioeconomic determinants	- socioeconomic status
Parental determinants	- expectations - level of education - involvement - occupation - <i>pressure</i>
Scholar determinants	- size - <i>location</i> - type of education - quality of the teacher - encouragement of the teacher - resources - information on labour market and careers - peer effect
Educational determinants	- <i>happy childhood</i> - <i>diversity of school paths</i>
Social group determinants	- <i>minority</i> - migrant - language
Living determinants	- <i>rural or urban</i>
Social determinants	- <i>state policy</i> - <i>values</i> - <i>language</i> - access to university
Gender-related determinants	- <i>gender segregation</i> - opportunities - <i>feasibility</i> - <i>gender stereotypes</i> - gender-typical occupations - <i>return on human capital</i> - self-concept - <i>impact of children</i> - preferences: <i>social preferences</i>, <i>risk aversion</i>, competitiveness, and fear of failure - <i>indecision</i>

2 CHAPTER 2: DATA DESCRIPTION

In analysing the determinants of educational and occupational aspirations and the alignment of these observations with performance, I need data on aspirations, determinants, and performance. The level of educational and occupational aspirations is the dependent variable. The educational aspirations are intrinsically related to the occupational aspirations and the factors of influence are mostly the same, therefore, I consider both in my analysis. While determinants of aspirations and performance are the independent variables. I consider each of these in turn. I also provide descriptive statistics on these variables.

Concerning the construction of the database, all data come from the OECD website¹. Only observations for Belgium are preserved because, in the context of a thesis, it is sufficient to consider one country. Only the edition 2018 of PISA tests is considered as previous editions did not ask questions or at least not three questions on aspirations. In 2015, the questionnaire incorporated only two questions. Before 2015, there were no questions on educational and professional aspirations, except one question in 2006. Moreover, the way to code occupations has changed between 2015 and 2018. Lastly, the PISA survey has no panel dimension. It results in 8475 observations.

Before being able to go further into the data description, I have to give some explanations on PISA. The objective is not to give an exhaustive description but rather to bring some elements to understand the interest of PISA. PISA stands for “program for international student assessment”. It is organized by the OECD. The rationale for this test is that a large number of countries are interested in comparing the education results of students based on common standards. The PISA tests are restricted to the subjects of reading, mathematics, and science (Lafontaine, 2006). Moreover, PISA tests are also an occasion to collect data on multiple indicators concerning the student, the family of the student and the school of the student. Therefore, it offers a complete dataset for each student concerned by the tests.

2.1 DEPENDENT VARIABLES

As mentioned above, there are three questions regarding educational and occupational aspirations in the PISA tests, for the 2018 edition. Therefore, there are three dependent variables. Each subsection details one of these dependent variables by presenting the question, the way the answers are coded and their meaning.

2.1.1 First question: educational aspirations

The question ST225 proposed in the student questionnaire concerns educational aspirations. The formulation of the question makes reference to realistic aspirations as the verb “expect” is used. The answers are coded by using a dummy for each possible answer. For example, if the students checked the 1st degree of secondary, the variable reflecting this answer is equal to 1. As it is easier to use one variable, I generate a new categorical variable. The values of this new

¹ OECD. (2019, December). PISA 2018 Database . Retrieved from OECD - Better policies for better lives : <https://www.oecd.org/pisa/data/2018database/>

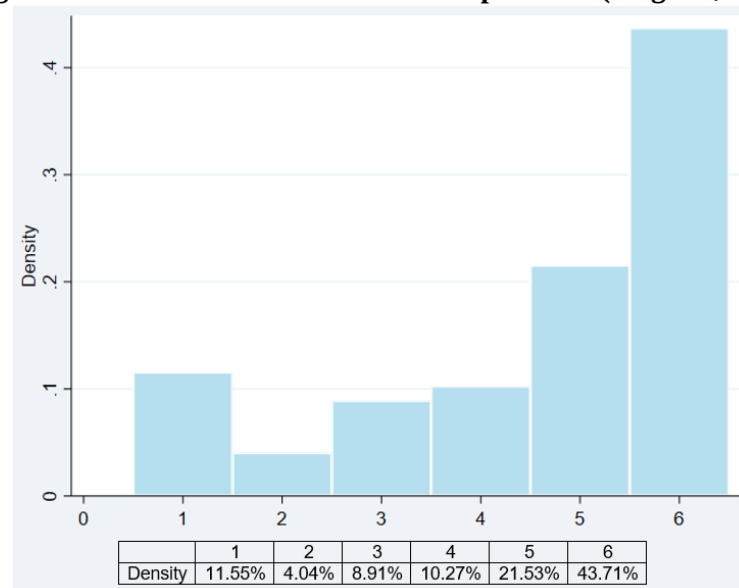
variable range from 1 to 6 and reflects the fact that the student checked the 1st, 2nd, 3rd, 4th, 5th, or 6th answer. I only keep the highest expected level for each student² (OECD, 2019).

ST225. Which of the following do you expect to complete³?

- 1st degree of secondary
- 2nd degree of secondary
- 3rd degree of secondary
- 7th year of secondary
- Bachelor
- Master or PhD.

Figure 2.1. represents the distribution of educational aspirations, in terms of density for each answer. The distribution is skewed to the right. Few students aspire below Bachelor as less than 50% of the student chose answers 1 to 4. The category Master or PhD was selected by 43.71% of the respondents; it is the majority category. There is a nonnegligible share of students that do not expect to complete more than the 1st degree of secondary. Indeed, 11.55% of students have this level of educational aspirations. Here, I consider that students have high educational aspirations if they expect to complete at least Bachelor. It is the case for 65.24% of the students.

Figure 2.1. Distribution of educational aspirations (Belgium, 2018)



Source: data from PISA 2018

2.1.2 Second question: occupational aspirations

The question ST114 proposed in the student questionnaire concerns occupational aspirations. As for the question on educational aspiration, the formulation of the question makes reference to realistic aspirations. The answers are first coded to four digits by using ISCO (International Standard Classification of Occupations) classification then by translating ISCO into ISEI

² By replacing six qualitative dummy variables by one categorical variable, I only keep one variable which is easier but I impose a quantification that cannot be found in the qualitative variables.

³ Level of education are actually coded in ISCED levels. Here, I present the correspondence of this level for Belgian education system. The categories are more complex, but it does not bring any additional insights in this case.

(International Socio-Economic Index of Occupational Status) scores (OECD, 2019). For example, the score for judges is 90 while the score for farmworker is 16 (Ganzeboom, De Graaf, & Treiman, 1992, pp. 33-51).

ST114. What kind of job do you expect to have when you are about 30 years old?

First, the ISCO classification is composed of 4 digits. Each digit represents one of the four levels of classification: major, sub-major, minor and unit groups. This classification allows classifying all jobs in the world into 436 unit groups. These groups are aggregated into 130 minor groups, 43 sub-major groups and 10 major groups. The classification is based on similarity in terms of the skill level and skill specialization required for the different occupations. The major groups are presented in Table 2.1. to give an idea of what the classification looks like⁴ (International Labour Organization , 2016).

Second, ISEI index is based on the weighted sum of average income and average education for the occupation. The aim of this index is not to reflect prestige, but it does so because education and income are related to power which is connected to prestige. The index is based on a study realised on an international sample considering men and women between 20 and 64 years and working at least 30 hours per week. The index is constructed such that higher scores indicate higher levels of expected occupational status. The score ranges from 0 to 100. Finally, there exist correspondence tables between ISCO and ISEI that allows translating quickly the four digits into a score (Ganzeboom, De Graaf, & Treiman, 1992).

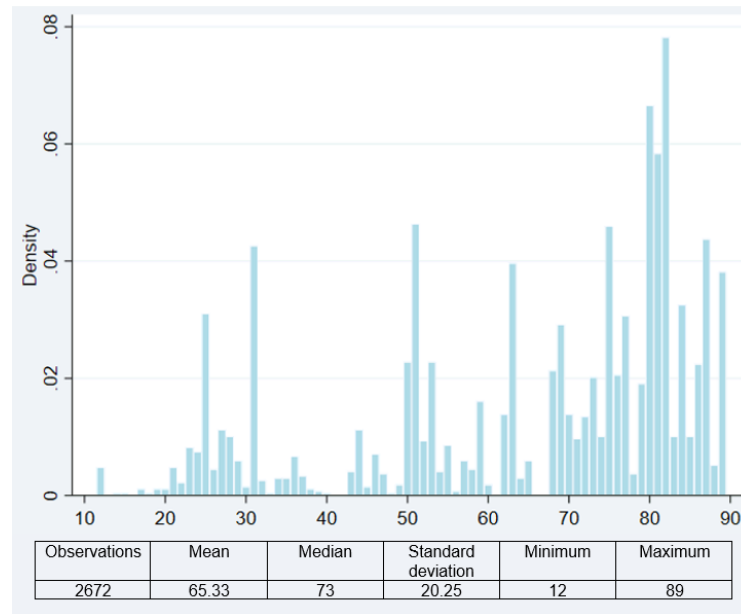
Table 2.1. ISCO classification: majors

1 st digit	Majors	Examples
1	Managers	Human Resource Managers
2	Professionals	Meteorologists
3	Technicians and Associate Professionals	Electrical Engineering Technicians
4	Clerical Support Workers	General Office Clerks
5	Services and Sales Workers	Travel Guides
6	Skilled Agricultural, Forestry and Fishery Workers	Field Crop and Vegetable Growers
7	Craft and Related Trades Workers	House Builders
8	Plant and Machine Operators and Assemblers	Miners and Quarriers
9	Elementary Occupations	Domestic Cleaners and Helpers
0	Armed Forces Occupations	Armed Forces Officers

Source: (International Labour Organization , 2016)

Figure 2.2. represents the distribution of occupational aspirations, in terms of density for each score. For this question, I only have 2672 observations due to missing and invalid answers. The distribution is skewed to the right because the median is 73 while the mean is 65. The mean is quite high. To give an idea, a score of 65 could refer to an industrial engineer, for example. The distribution is widely dispersed with a standard deviation of 20.25. The minimum score is 12 and the maximum score is 89. There are only two scores with density higher than 8%: 80 which could refer to a statistical technician and 82 which could make reference to a jurist.

⁴ The full classification is available in the document “Index of occupational titles” on the website referenced.

Figure 2.2. Distribution of occupational aspirations (Belgium, 2018)

Source: data from PISA 2018

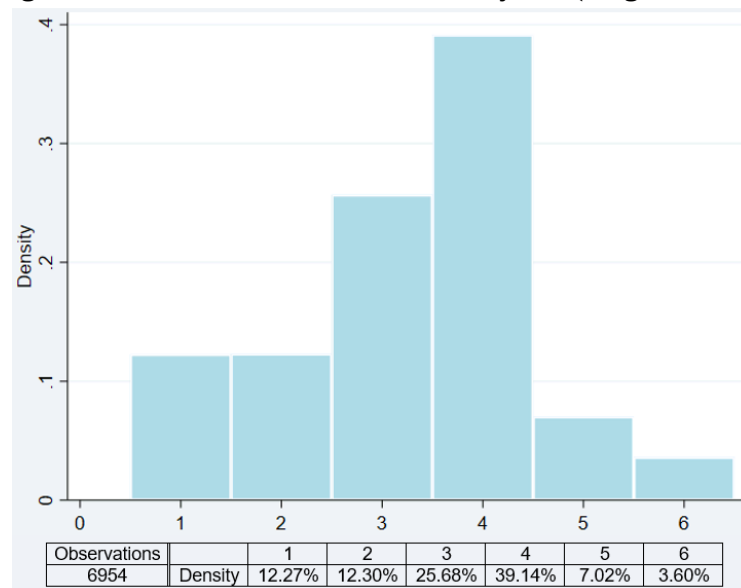
2.1.3 Third question: situation in 5 years

The question EC152 proposed in the educational career questionnaire concerns situation in 5 years. The formulation of the question makes reference to realistic aspirations as the verb “do” is used. The answers are coded by using a nominal variable that takes quantitative values representing categories and there is no intrinsic ordering of these categories. The values of this variable range from 1 to 6 and reflects the fact that the student checked the 1st, 2nd, 3rd, 4th, 5th, or 6th answer. I generate an additional categorical variable that is equal to 1 if the student’s situation in 5 years is related to occupational aspirations (answers 1 and 4) and 0 otherwise. This variable reflects the role of occupational aspirations on educational aspirations (OECD, 2019).

EC152. What do you think you will be doing 5 years from now?

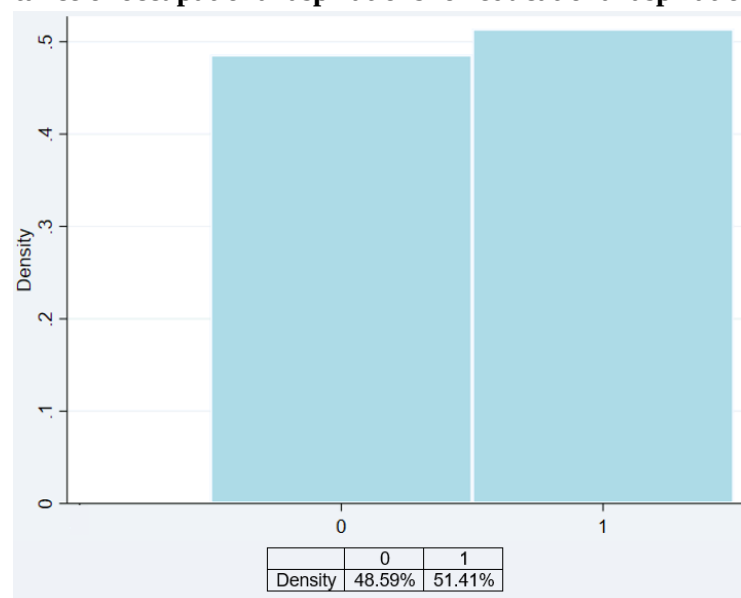
- *I will be working because the occupation I want does not require a study degree (e.g., diploma or university degree).*
- *I will be working because I need to be financially independent.*
- *I will be studying because I do not know what I would like to do yet.*
- *I will be studying because the occupation I want requires a study degree (e.g., diploma or university degree).*
- *I will be studying or working for other reasons.*
- *I will be doing something else (e.g. <national examples>)*

Figure 2.3. represents the distribution of the situation in 5 years, in terms of density for each answer. For this question, I only have 6954 observations due to missing and invalid answers. The distribution is close to the normal distribution. The fourth category was selected by 39.14% of the respondents; it is the majority category. There is a nonnegligible share of students that do not plan to study in 5 years, at least 28.17%.

Figure 2.3. Distribution of situation in 5 years (Belgium, 2018)

Source: data from PISA 2018

Figure 2.4. represents the importance of occupational aspirations for educational aspirations, measured by using the categorical variable I created on the basis of the answers to question EC152. The results advocate for an important role of occupational aspirations as more than 50% of the respondents report that occupational aspirations determine what they will be doing in 5 years. Precisely, for 51.41% of the students, their occupational aspirations determine if they will be working or studying in 5 years.

Figure 2.4. Importance of occupational aspirations for educational aspirations (Belgium, 2018)

Source: data from PISA 2018

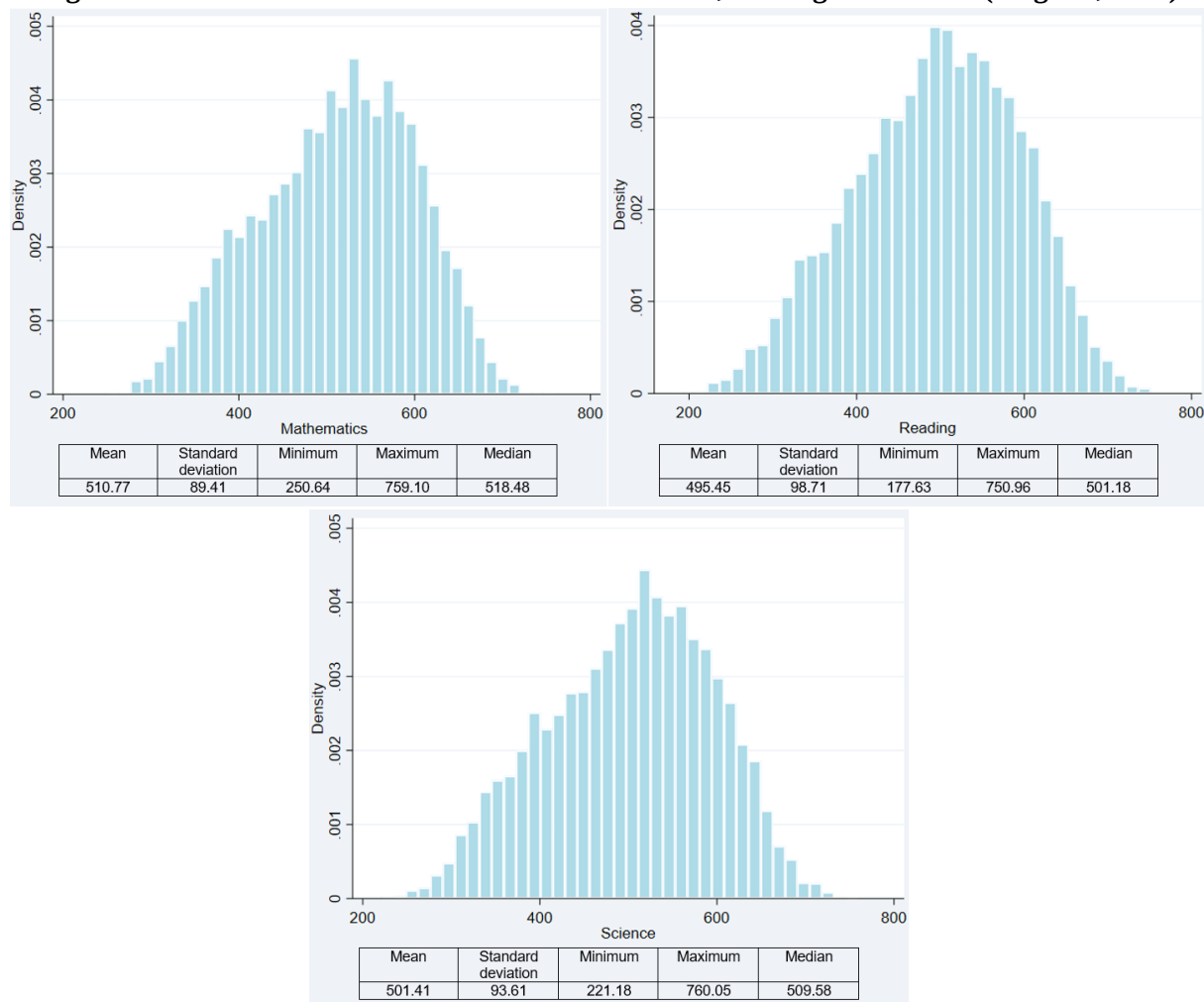
2.2 INDEPENDENT VARIABLES

2.2.1 Individual determinants

Performance

The only individual determinant for which there are data in the PISA database is performance. As the main objective of PISA is to evaluate the performance of students in mathematics, science and reading, the database contains scores for each field. The database also offers scores for subcategories of the field that will not be used here. The scores are based on students' answers to the tests. Based on the fact that the answer is right and the level of the question, a score is attributed to the test. PISA score are not physical units; therefore, they do not have substantive meaning. They are determined with the variation of the results observed across all participants (OECD, 2019).

Figure 2.5. Distribution of PISA scores in mathematics, reading and science (Belgium, 2018)



Source: data from PISA 2018

There are no minimum or maximum score because the results are scaled to fit approximately a normal distribution with a mean around 500 and standard deviation around 100. To report student performance, PISA uses plausible values to infer the ability of a student from his performance at the tests. For each student, 10 plausible values are provided. They correspond

to distinct draws in the plausible distribution of abilities of the students. PISA recommends averaging all plausible values. Therefore, that is what has been done here (OECD, 2019).

Figure 2.5. represents the distribution of PISA scores in mathematics, reading and science, in terms of density for each score. The three distribution looks like a normal distribution. The median is close to and above mean in all cases. The median and the mean are respectively 518.48 and 510.77 for mathematics, 501.18 and 495.45 for reading and 509.58 and 501.41 for science. The most dispersed distribution is the distribution of reading scores. The minima and maxima for each field are 250.64 and 759.10 for mathematics, 177.63 and 750.96 for reading and 221.18 and 760.05 for science.

Extracurricular activities

Although there is no indicator of extracurricular activities, the question EC153 asks students about the importance of a couple of factors on their occupational aspirations. One of these factors is hobbies. The answers are coded by using a categorical variable. This variable equals 1 if the factor is not important, 2 if the factor is somewhat important, 3 if the factor is important, and 4 if the factor is very important. This question is useful to evaluate the importance of extracurricular activities in the formation of occupational aspirations. As this variable cannot be used in the econometric analysis, I only provide descriptive statistics.

Table 2.2. presents the distribution of the importance of hobbies on occupational aspirations, in terms of density. It is undeniable that hobbies play an important role in the formation of occupational aspirations because only 12.46% of students do not consider that it matters. Precisely, 38.77% of students find hobbies important and 23.27% of students affirm that they are very important. It tends to confirm that there is a relationship between extracurricular activities and occupational aspirations. Nevertheless, it is impossible to determine the exact relationship due to the form of the variable.

Table 2.2. Distribution of the importance of hobbies on occupational aspirations (Belgium, 2018)

Observations		1	2	3	4
6776	Density	12.46%	25.50%	38.77%	23.27%

Source: data from PISA 2018

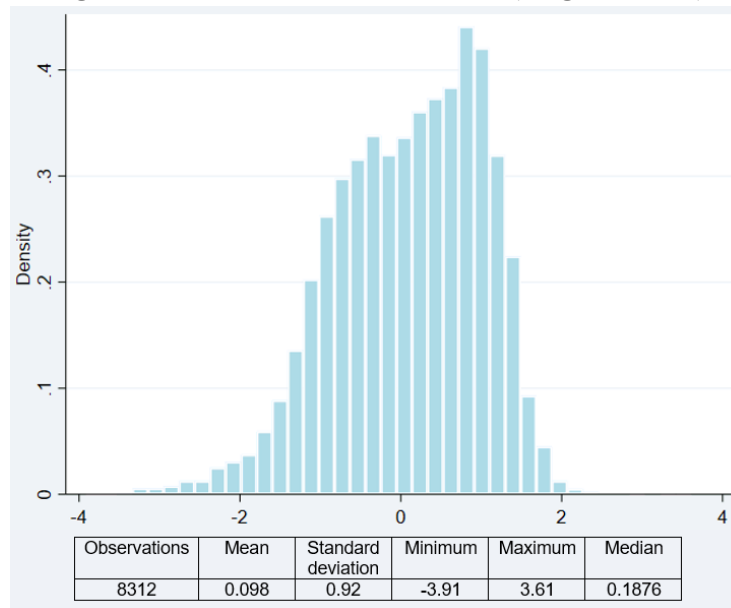
2.2.2 Socioeconomic determinant

Regarding the socioeconomic status of students, there exists a PISA index of economic, social, and cultural values (ESCS). This index is constructed based on the following variables: the highest level of education of the student's parents, the highest international socio-economic index of occupational status of the student's parents, and an index including the PISA index of family wealth, the PISA index of home educational resources and the PISA index of cultural possessions in the family home. The final ESCS is transformed, with 0 the score of an average OECD student (OECD, 2019).

Figure 2.6. represents the distribution of the ESCS, in terms of density. For this index, I only have 8312 observations due to missing values. If there are missing values on more than one of three indices composing ESCS, it is not computed, and a missing value is assigned. The distribution is skewed to the right because the median is 0.1876 while the mean is 0.098. The

mean is quite low due to very negative values, as the minimum is -3.91. The distribution is widely dispersed with a standard deviation of 0.92, which is equivalent to almost 10 times the mean. The maximum value of the index is 3.61.

Figure 2.6. Distribution of the ESCS (Belgium, 2018)



Source: data from PISA 2018

2.2.3 Parental determinants

Expectations

The question PA172 proposed in the parent questionnaire concerns educational aspirations. This question is about the expectations of parents for their children, in terms of education. The formulation of this question is the same as the question of educational aspirations proposed to students (OECD, 2019). Also, the answers are coded in the same way. As for the question of the student questionnaire, I generate a new categorical variable. The values of this new categorical variable range from 1 to 6 and reflects the fact that the parent checked the 1st, 2nd, 3rd, 4th, 5th, or 6th answer. I only keep the highest expected level for each student⁵.

PA172. Which of the following do you expect your child to complete?

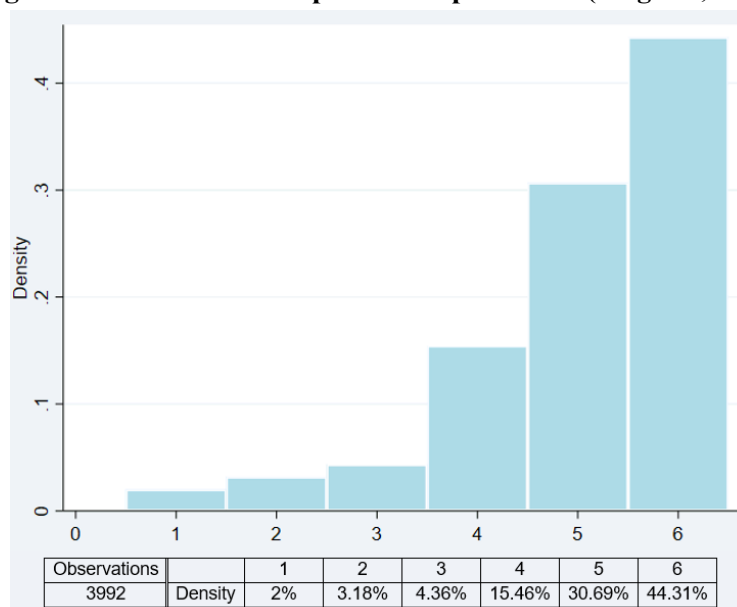
- 1st degree of secondary
- 2nd degree of secondary
- 3rd degree of secondary
- 7th year of secondary
- Bachelor
- Master or PhD.

Figure 2.7. represents the distribution of educational expectations of parents for their children, in terms of density for each answer. The distribution is skewed to the right. Few parents expect that their children educational level will be below Bachelor as less than 50% of the respondents

⁵ By replacing six qualitative dummy variables by one categorical variable, I only keep one variable which is easier but I impose a quantification that cannot be found in the qualitative variables.

chose answers 1 to 4. The category Master or PhD was selected by 44.31% of the respondents; it is the majority category. There is a nonnegligible share of parents that do not expect that their children will complete more than the 1st degree of secondary. It is important to notice that parents have higher expectations for their children than children have for themselves.

Figure 2.7. Distribution of parents' expectations (Belgium, 2018)



Source: data from PISA 2018

Besides this variable on parents' expectations in terms of education and as for extracurricular activities, the question EC153 asks students about the importance of parents' expectations on their occupational aspirations. The answers are coded by using a categorical variable. This variable is equal to 1 if the factor is not important, 2 if the factor is somewhat important, 3 if the factor is important and 4 if the factor is very important. This question is useful to evaluate the importance of parents' expectations in the formation of occupational aspirations. As this variable cannot be used in the econometric analysis, I only provide descriptive statistics.

Table 2.3. presents the distribution of the importance of parents' expectations on occupational aspirations, in terms of density. It is undeniable that parents' expectations play an important role in the formation of occupational aspirations because only 14.77% of students do not consider that it matters. Precisely, 40.88% of students find parents' expectations important and 14.99% of students affirm that they are very important. It tends to confirm that there is a relationship between parents' expectations and occupational aspirations. Nevertheless, it is impossible to determine the exact relationship due to the form of the variable.

Table 2.3. Distribution of the importance of parents' expectations on occupational aspirations (Belgium, 2018)

Observations		1	2	3	4
6811	Density	14.77%	29.36%	40.88%	14.99%

Source: data from PISA 2018

Level of education

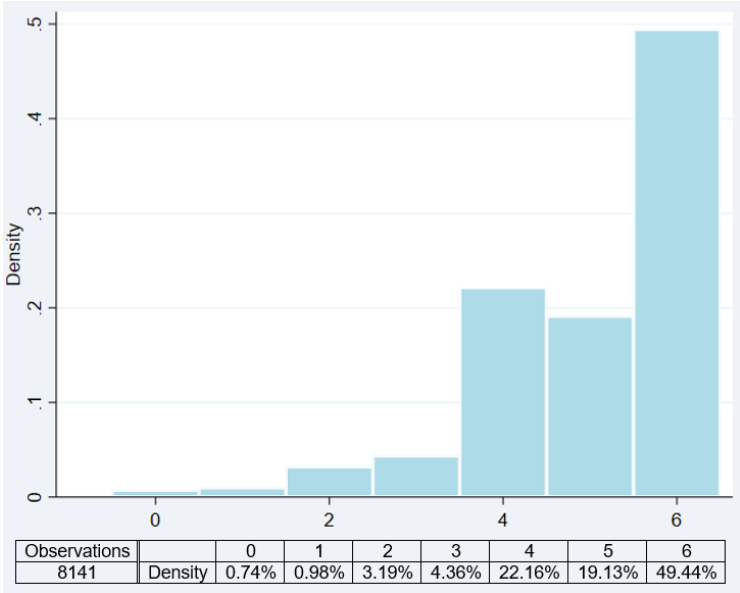
There exist multiple variables measuring the levels of education of parents in years of schooling or ISCED level. Basically, these two ways of measuring the level of education are equivalent. To keep consistent with the measure of the level of educational aspirations of students, the measure in ISCED level will be used. As the specific level of the mother and the father of the student does not matter for aspirations, only the highest level of parents is considered. Therefore, I will take into account the highest level of education of parents in ISCED level. The categorical variables are coded similarly as for students: the values range from 0 to 6 and reflects the fact that the parent checked the 1st, 2nd, 3rd, 4th, 5th, 6th or 7th answer. There is one additional possibility which is none (OECD, 2019).

HISCED. Highest education of parents in ISCED

- None: 0
- 1st degree of secondary: 1
- 2nd degree of secondary: 2
- 3rd degree of secondary: 3
- 7th year of secondary: 4
- Bachelor:5
- Master or PhD: 6

Figure 2.8. represents the distribution of the highest level of education of parents, in terms of density for each level. The distribution is skewed to the right. The highest level of education of parents is mainly at least Bachelor as less than 50% of the observations are levels 1 to 4. The level Master or PhD is the highest level of education for 49.44% of the parents; it is the majority category. There is a nonnegligible share of observations below the end of secondary. Indeed, 4.91% of observations are below this level of education. Finally, the highest level of education of parents is more skewed to the right than the level of educational aspirations of students.

Figure 2.8. Distribution of the highest level of education of parents (Belgium, 2018)

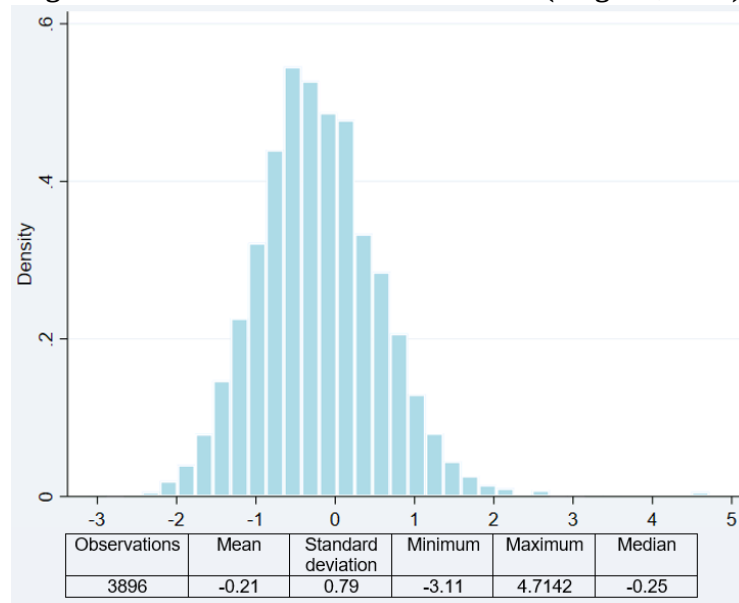


Source: data from PISA 2018

Involvement

Regarding the involvement of parents, there exists a PISA index of parental support for learning at home (CURSUPP). This index is constructed based on the answers of parents to questions concerning the regularity with which they discuss, help, or spend time with their children. It considers 8 different questions on parental support for learning at home. Answering categories range from “never or hardly ever” to “every day or almost every day”. The answers are aggregated in one indicator than the final index is transformed such that 0 is the index of an average parent in OECD. The higher the index, the better parental support (OECD, 2019).

Figure 2.9. Distribution of the CURSUPP (Belgium, 2018)



Source: data from PISA 2018

Figure 2.9. represents the distribution of the CURSUPP, in terms of density. For this index, I only have 3896 observations due to missing values. The distribution is skewed to the left because the median is -0.25 while the mean is -0.21. The mean is quite low due to very negative values, as the minimum is -3.11. The distribution is widely dispersed with a standard deviation of 0.79. The maximum value of the index is 4.7142. It seems that average Belgian parents are less supportive for learning at home than average parents of OECD.

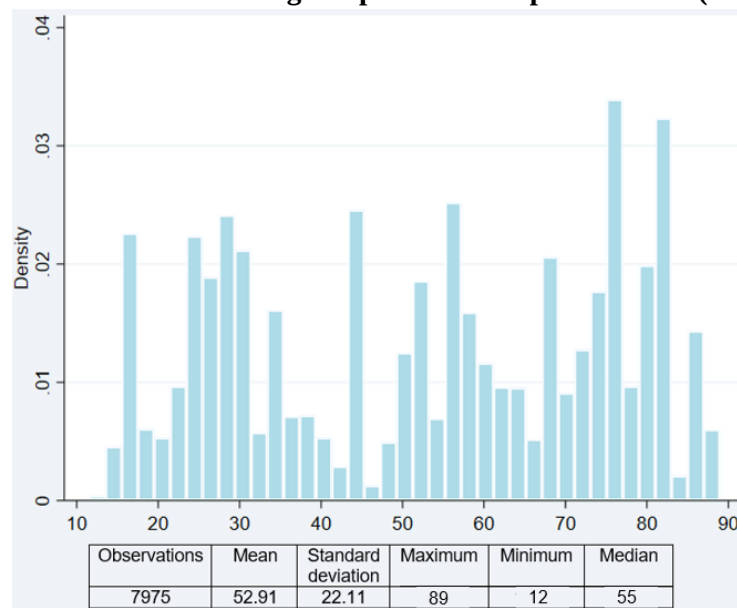
Occupation

There exist multiple variables measuring the levels of occupation of parents. I only consider variables coded using ISEI scores, as for students' occupational aspirations. I use three variables. First, the highest index of parental occupation status represents the highest ISEI score of parents. Second, the ISEI score of the mother. Finally, the ISEI score of the father. The first variable is used as it is proposed in the PISA database. While the two other variables are used to create a categorical variable, which equals 1 when the ISEI score of the mother is at least as high as the ISEI score of the father and 0 otherwise because it makes a difference for aspirations.

Figure 2.10. represents the distribution of the highest parental occupation status, in terms of density for each score. There are only 7975 observations due to missing values. The distribution is skewed to the right because the median is 55 and the mean is 52.91. The mean is lower than

in the distribution of occupational aspirations of students. The distribution is widely dispersed with a standard deviation of 22.11. The minimum score is 12 and the maximum score is 89.

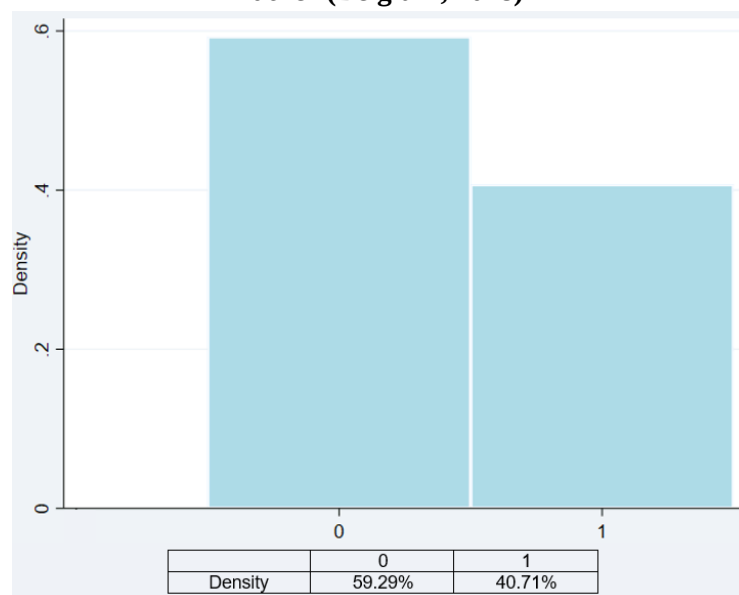
Figure 2.10. Distribution of the highest parental occupation status (Belgium, 2018)



Source: data from PISA 2018

Figure 2.11. represents the distribution of the difference between the occupational status of the mother and the father. Precisely, this value is equal to 1 if the ISEI score of the mother is at least as high as the ISEI score of the father, and 0 otherwise. It is not surprising to observe that most of the time the father has a higher occupational status than the mother. For only 40.71% of the households, the mother has at least an occupational status as high as the father. While for 59.29% of the households, the father has an occupational status higher than the mother.

Figure 2.11. Distribution of the difference between the occupational status of the mother and the father (Belgium, 2018)



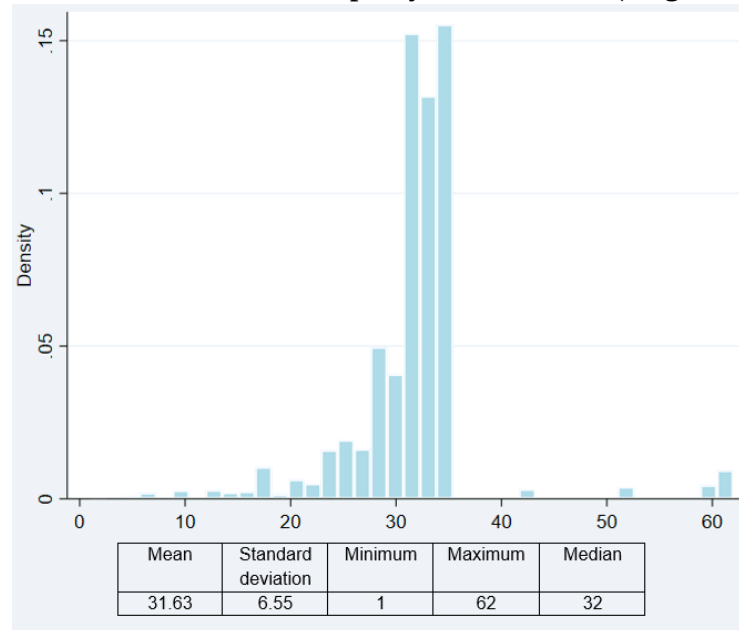
Source: data from PISA 2018

2.2.4 Scholar determinants

Size

In order to keep using only one PISA database, I will use the number of respondents per school as a proxy for the school size. Figure 2.12. represents the distribution of this proxy. The distribution is skewed to the right because the median is 32 and the mean is 31.63. The maximum is 62 and the minimum is 1. The distribution is widely widespread as the standard deviation is 6.55, which is equivalent to one-fifth of the mean. The majority size is 33.

Figure 2.12. Distribution of the proxy for school size (Belgium, 2018)

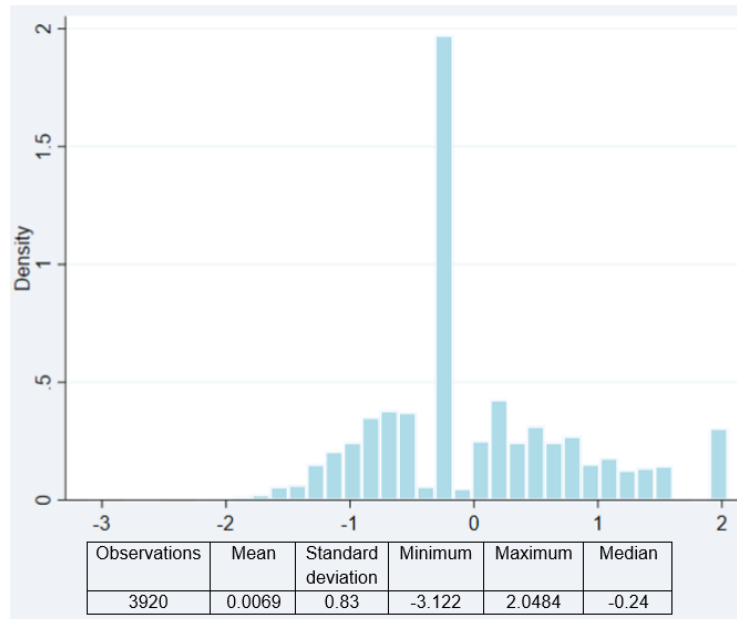


Source: data from PISA 2018

Quality of the teacher

As there is no indicator of teacher quality, the index of parents' perceptions of the quality of school learning is used as a proxy. This index is derived from the degree of assent of parents with a couple of propositions on the quality of the teachers, the teaching, and the school. The range of answers goes from "strongly agree" to "strongly disagree". All items are scaled by giving higher values to the first answers. The index is calculated as a ratio of a sum of all questions over the maximum score of valid responses. The more positive values on this index, the more positive parents' perception of school quality. A positive score also indicates that parents perceive their child's school to be of higher quality than the OECD average parents' evaluations (OECD, 2019).

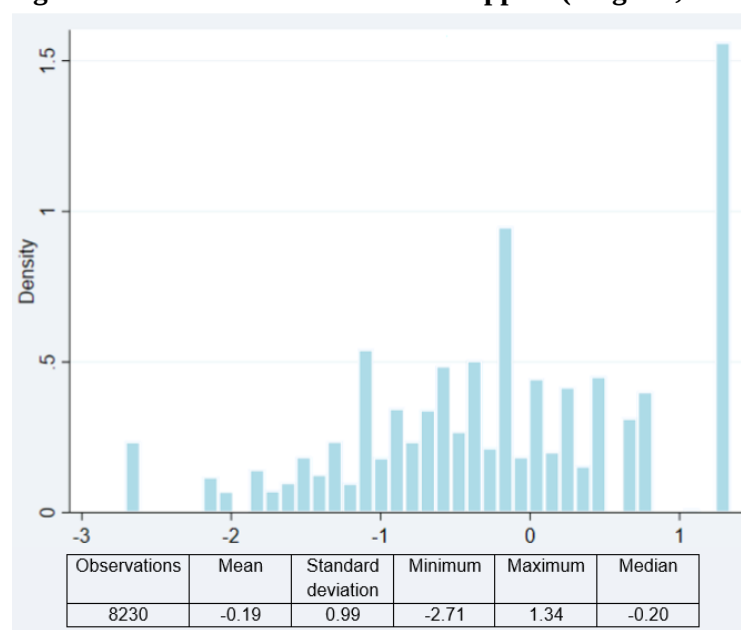
Figure 2.13. represents the distribution of the index of parents' perceptions of the quality of school learning, in terms of density. For this index, I only have 3920 observations due to missing values. The median is -0.24 while the mean is 0.0069. The mean is quite low due to very negative values, as the minimum is -3.12. The distribution is widely dispersed with a standard deviation of 0.83. The maximum value of the index is 2.0484. The majority score is -0.24 with 1074 observations. It seems that Belgian parents have, on average, a little bit higher perception of the school's quality than other parents of OECD.

Figure 2.13. Distribution of school quality (Belgium, 2018)

Source: data from PISA 2018

Teacher encouragement

In order to measure the encouragement of the teacher, the index for teacher support is used. This index is constructed using student's responses to a trend question about how often the teacher supports the student or another student. The teacher support is defined by an interest in student's learning, extra help to students that need it, help to students and the importance of student's understanding for the teacher. A positive value of this index means that students perceived their teacher to support them more often than do the average student across OECD countries (OECD, 2019).

Figure 2.14. Distribution of teacher support (Belgium, 2018)

Source: data from PISA 2018

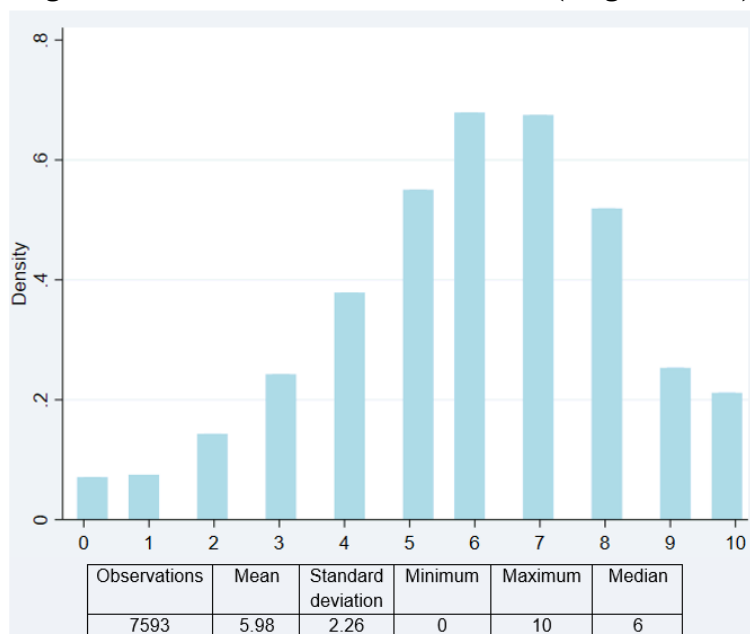
Figure 2.14. represents the distribution of the index of teacher support perceived by students, in terms of density. For this index, I only have 8230 observations due to missing values. The median is -0.20 while the mean is -0.19. The mean is quite low due to very negative values, as the minimum is -2.71. The distribution is widely dispersed with a standard deviation of 0.99. The maximum value of the index is 1.34. The majority score is 1.31 with 1334 observations. It seems that Belgian students have, on average, a little bit lower perception of the teacher's support than other students of OECD.

Resources

As there is no indicator of school resources, the index of ICT resources available at school is used as a proxy. This index is based on a question asking for the availability of a series of ICT resources at school: desktop computer, laptop, tablet, internet-connected computer, internet connection via a wireless network, storage space for school-related data, USB stick, eBook reader, data projector and interactive whiteboard. For each item, the answer is coded 1 if the students checked yes and 0 if they chose no. The index is simply the sum for all items. It takes, therefore, a value between 0 and 11 (OECD, 2019).

Figure 2.15. represents the distribution of the index ICT resources at school, in terms of density. For this index, I only have 7593 observations due to missing values. The median is 6 while the mean is 5.98. The mean is quite high because it implies that on average schools have half of the ICT resources. The minimum is 0. The distribution is widely dispersed with a standard deviation of 2.26. The maximum value of the index is 10, no school has all ICT resources. The majority score is 6 with 1357 observations.

Figure 2.15. Distribution of ICT resources (Belgium, 2018)



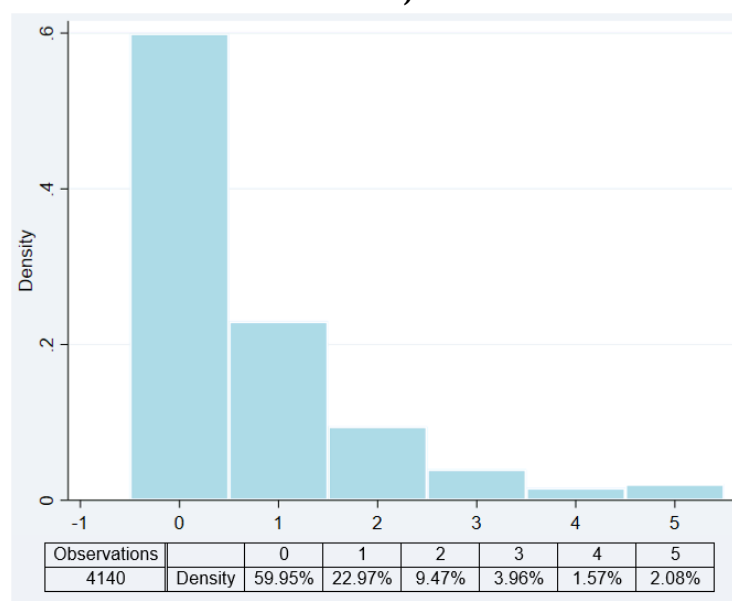
Source: data from PISA 2018

Information on the labour market and career

Based on the question EC151 of the educational career questionnaire, there exist data on whether students acquired information related to the job at school. Precisely, the question is divided into sub-questions asking if the students acquired skills on how to find information on jobs, how to search for a job, how to write a summary of qualifications, how to prepare for a job interview and how to find information on student financing. When the students answer yes, the value for the sub-question is 1 and 0, otherwise (OECD, 2019). Here, I consider the sum of all items. Therefore, the minimum is 0 and the maximum is 5.

Figure 2.16. represents the distribution of information on the labour market and career at school, in terms of density. Here, I only have 4140 observations because of missing values. The distribution is skewed to the left. Few students acquire information on the labour market and career at school, as more than 50% of the respondents have no information for all elements of the sub-questions. 40.05% of the students obtained at least one information at school. Only a minority of students received all information at school (2.08%).

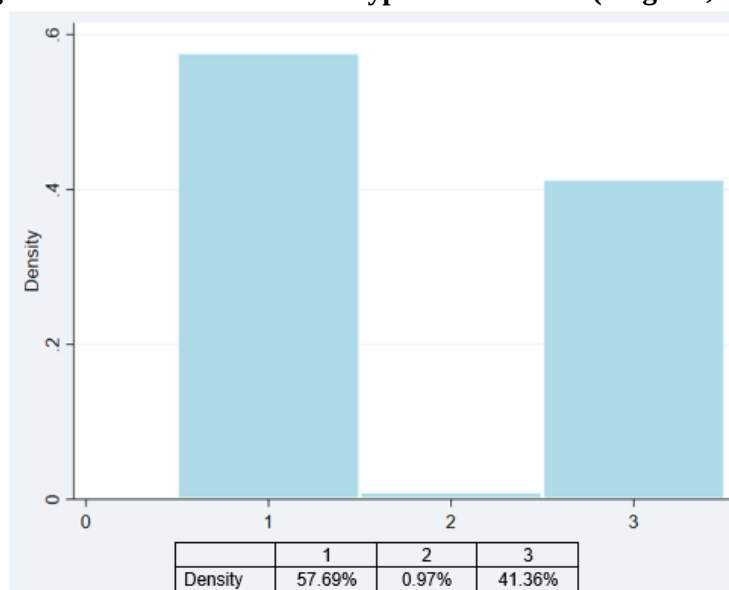
Figure 2.16. Distribution of information on the labour market and career at school (Belgium, 2018)



Source: data from PISA 2018

Type of education

In order to measure the type of education, programme orientation is used. This variable is equal to 1 for general orientation, 2 for pre-vocational orientation and 3 for vocational orientation. Figure 2.17. represents the distribution of the types of education, in terms of density. 57.69% of students follow general education while 41.36% of students follow vocational education.

Figure 2.17. Distribution of the types of education (Belgium, 2018)

Source: data from PISA 2018

Peer effect

Although there is no indicator of peer effect, the question EC153 asks students about the importance of a couple of factors on their occupational aspirations. One of these factors is the plans of close friends. The answers are coded by using a categorical variable. This variable equals 1 if the factor is not important, 2 if the factor is somewhat important, 3 if the factor is important and 4 if the factor is very important. This question is useful to evaluate the importance of peer effect in the formation of occupational aspirations. As this variable cannot be used in the econometric analysis, I only provide descriptive statistics.

Table 2.4. presents the distribution of the importance of close friends' plans for their future on occupational aspirations, in terms of density. The results are surprising as only 23.95% of respondents think that the plans of close friends are important and 4.26% of students think that they are very important. In other words, the majority does not consider that friends' plans are important. It tends to invalidate that there is a relationship between friends' plans and occupational aspirations. Nevertheless, it is impossible to determine the exact relationship due to the form of the variable.

Table 2.4. Distribution of the importance of close friends' plans on occupational aspirations (Belgium, 2018)

Observations		1	2	3	4
6777	Density	35.61%	36.18%	23.95%	4.26%

Source: data from PISA 2018

2.2.5 Social group determinants

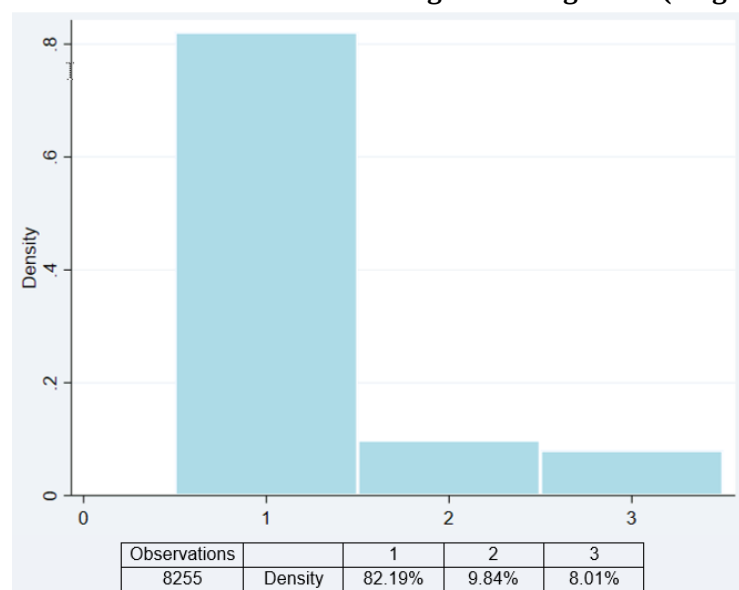
Migrant

In order to measure the status of the students in terms of migration, the index of immigrant background (IMMIG) is used. This index is calculated based on the country of birth of the students and their parents. This index is equal to 1 for native students, 2 for second-generation

students and 3 for first-generation students. For second-generation students, both parents were born in another country. For first-generation students, the students and their parents were all born in another country (OECD, 2019).

Figure 2.18. represents the distribution of the index of immigrant background, in terms of density. There are only 8255 observations due to missing variables in one of the three components of the index. The majority of students are actually native students (82.19%). For the rest of the students, 9.84% of them are first-generation students and 8.01% of them are second-generation students.

Figure 2.18. Distribution of the index of immigrant background (Belgium, 2018)



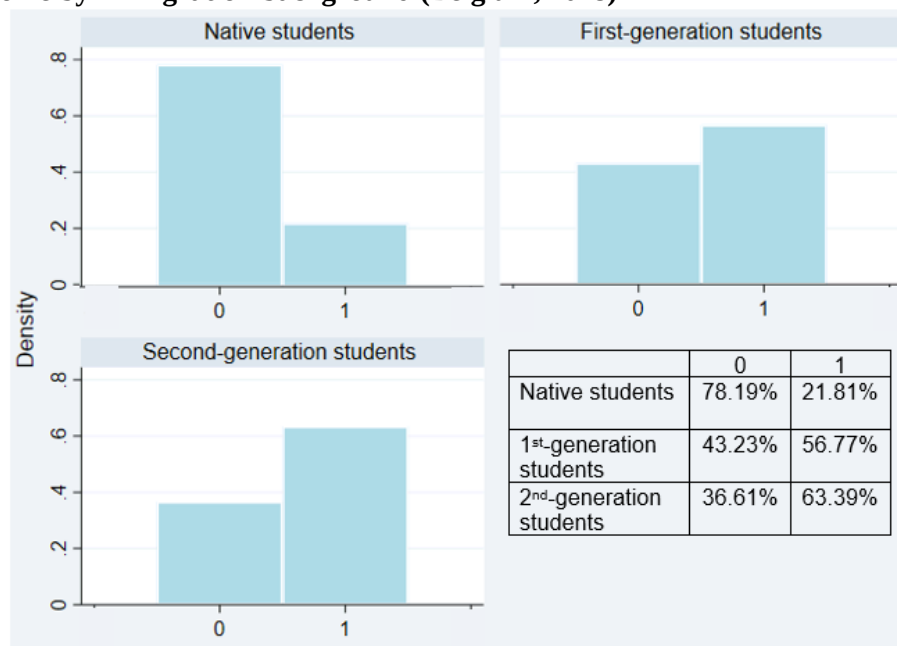
Source: data from PISA 2018

Language spoken at home

The literature states that the role of immigration background for aspirations depends on the language spoken at home. Here a dummy variable is used. This variable is equal to 1 if the language of the test is different from the language mainly spoken at home. It is equal to 0 if the language of the test and the language mainly spoken at home are the same (OECD, 2019). As the interest is in the interaction between the immigration background and the language spoken at home, the distribution of the dummy is considered by immigration background.

Figure 2.19. represents the distribution of the difference between the language of the test and the language spoken at home by immigration background and in terms of density. It is not surprising that native students are more likely to speak the same language at home as the language of the test. Also, second-generation students are less likely than first-generation students to speak the language of the test at home. The difference is important between native students and first-generation students, as native students speak the language of the test at home with a probability of 78.19%, while this probability is 43.23% for the first-generation students.

Figure 2.19. Distribution of the difference between the language of the test and the language spoken at home by immigration background (Belgium, 2018)



Source: data from PISA 2018

2.2.6 Social determinants

The only social determinant for which there are data in the PISA database is access to university. Although there is no indicator of access to university, the question EC153 asks students about the importance of a couple of factors on their occupational aspirations. One of these factors is financial support for education or training (the question does not specify the source of financial support). The answers are coded by using a categorical variable. This variable is equal to 1 if the factor is not important, 2 if the factor is somewhat important, 3 if the factor is important and 4 if the factor is very important. This question is useful to evaluate partly the importance of access to university in the formation of occupational aspirations. As this variable cannot be used in the econometric analysis, I only provide descriptive statistics.

Table 2.5. presents the distribution of the importance of financial support for education on occupational aspirations, in terms of density. It is undeniable that financial support plays an important role in the formation of occupational aspirations because only 12.59% of students do not consider that it matters. Precisely, 45.88% of students find financial support important and 13.11% of students affirm that it is very important. It tends to confirm that there is a relationship between financial support for education and therefore, access to university and occupational aspirations. Nevertheless, it is impossible to determine the exact relationship due to the form of the variable.

Table 2.5. Distribution of the importance of financial support for education on occupational aspirations (Belgium, 2018)

Observations		1	2	3	4
6681	Density	12.59%	28.42%	45.88%	13.11%

Source: data from PISA 2018

2.2.7 Gender-related determinants

As the objective of this subsection is to look at gender-related determinants, all statistics are presented by gender. The sample is composed of 4721 girls (50.40%) and 4204 boys (49.60%).

Opportunities

Although there is no indicator of opportunities, the question EC153 asks students about the importance of a couple of factors on their occupational aspirations. One of these factors is employment opportunities. The answers are coded by using a categorical variable. This variable equals 1 if the factor is not important, 2 if the factor is somewhat important, 3 if the factor is important and 4 if the factor is very important. This question is useful to evaluate the importance of opportunities in the formation of occupational aspirations. As this variable cannot be used in the econometric analysis, I only provide descriptive statistics.

Table 2.6. presents the distribution of the importance of employment opportunities on occupational aspirations, by gender and in terms of density. It is undeniable that opportunities play an important role in the formation of occupational aspirations both for girls and boys because only 4.85% of girls and 7.40% of boys do not consider that it matters. Precisely, 53.66% of girls and 53.11% of boys find opportunities important and 22.71% of girls and 20.52% of boys affirm that they are very important.

It seems that opportunities are slightly more important for girls than boys as the proportion of girls in categories 3 and 4 is higher than the proportion of boys. It tends to confirm that there is a relationship between opportunities and occupational aspirations and this relationship is stronger for girls. Nevertheless, it is impossible to determine the exact relationship due to the form of the variable.

Table 2.6. Distribution of the importance of employment opportunities on occupational aspirations (Belgium, 2018)

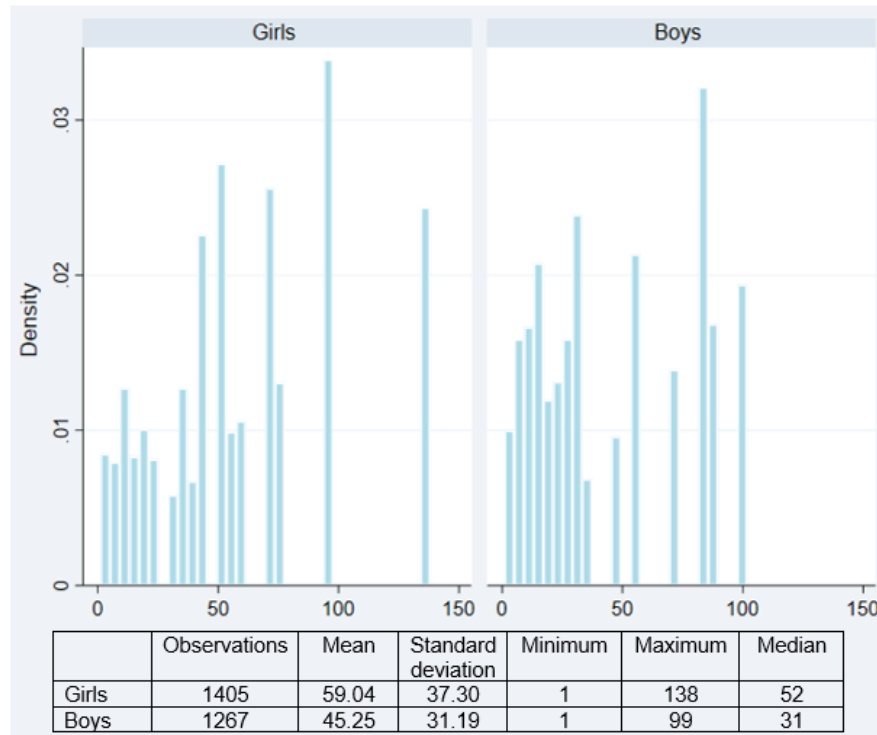
Observations		1	2	3	4
3483	Density for girls	4.85%	18.78%	53.66%	22.71%
3231	Density for boys	7.40%	18.97%	53.11%	20.52%

Source: data from PISA 2018

Gender-typical occupations

There is no indicator of gender-typical occupations in PISA database. Nevertheless, I generated a proxy that may give an idea of the importance of it. This proxy is the frequency to which another student of the same sex chooses the same occupation, measured by ISEI level, as the student concerned.

Figure 2.20. represents the distribution of the proxy for gender-typical occupations, in terms of density and by gender. Both the median and the mean is higher for girls than boys. It indicates that on average girls are more likely to choose an occupation similar to other girls, but also that it is true for more than 50% of the girls. The maximum is also significantly higher for girls than for boys. It confirms observations on the mean and the median. It tends to confirm that there is a relationship between gender-typical occupations and gender. But it contradicts the idea that boys are more influenced by what other boys do.

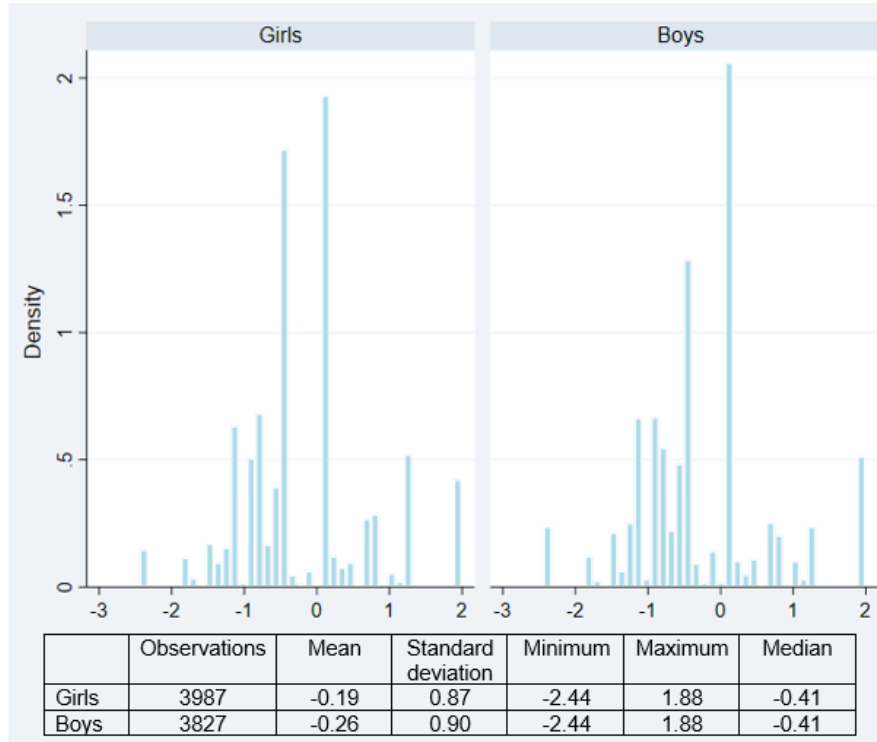
Figure 2.20. Distribution of the proxy for gender-typical occupations (Belgium, 2018)

Source: data from PISA 2018

Self-concept

Based on the question ST161 of the student questionnaire, there exists an index of self-perception of competence for each student. Precisely, the index is based on self-concept in reading with three statements: “I am a good reader”, “I am able to understand difficult texts” and “I read fluently”. The range of answers goes from “not at all” to “a lot”. A positive value in this index means that the students indicated greater self-perception of competence than the OECD average (OECD, 2019).

Figure 2.21. represents the distribution of the index of self-perception of competence of students, in terms of density and by gender. The medians are the same for both girls and boys. Nevertheless, the mean is higher for girls than boys. It indicates that on average girls have higher self-perception than boys. The maxima and the minima are the same for boys and girls. The standard deviation is higher for boys than girls. It tends to confirm that there is a relationship between self-concept and gender. However, it invalidates the fact that boys have higher self-perception than girls, as here girls have higher self-perception. Both boys and girls have self-perception lower than OECD average.

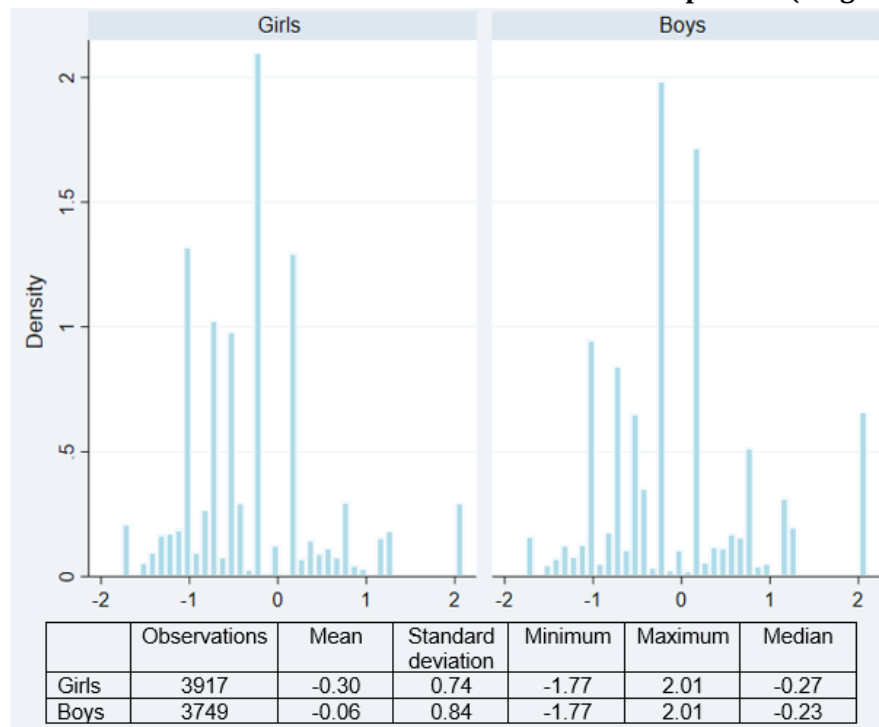
Figure 2.21. Distribution of the index of self-concept of students (Belgium, 2018)

Source: data from PISA 2018

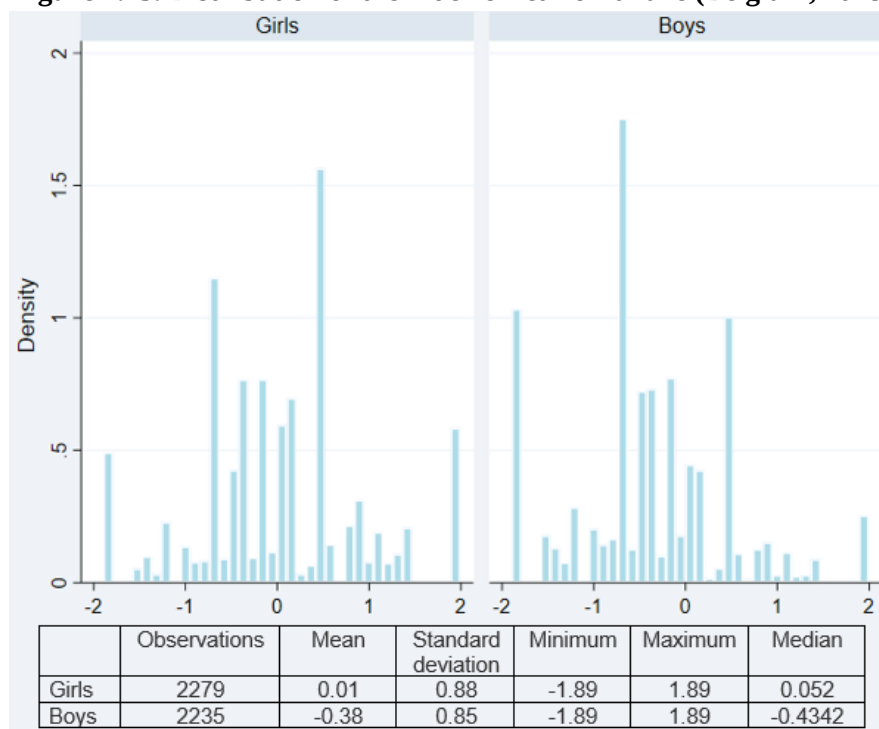
Preferences

There are only two aspects of preferences that can be measured using PISA data. First, the index of attitude towards competition. This index is based on responses to question ST181 of the student questionnaire. This question is subdivided into three sub-questions over the extent students agree with the following statements: “I enjoy working in situations involving competition with others”, “It is important for me to perform better than other people on a task” and “I try harder when I am in competition with other people”. A positive value of this index means that students expressed more favourable attitudes towards competition than the average student of OECD (OECD, 2019).

Figure 2.22. represents the distribution of the index of attitude towards competition in terms of density and by gender. Both the median and the mean are higher for boys than girls. It indicates that on average boys have a more positive attitude towards competitiveness, but also that it is true for more than 50% of the boys. The maxima and the minima are the same for boys and girls. The standard deviation is higher for boys than girls. It tends to confirm that there is a relationship between attitude towards competitiveness and gender. It also corroborates the idea that girls have a less positive attitude towards competitiveness. Both boys and girls have a less positive attitude towards competitiveness than the OECD average.

Figure 2.22. Distribution of the index of attitude towards competition (Belgium, 2018)

Source: data from PISA 2018

Figure 2.23. Distribution of the index of fear of failure (Belgium, 2018)

Source: data from PISA 2018

Second, the index of fear of failure. This index is based on responses to question ST183 of the student questionnaire. This question is subdivided into three sub-questions over the extent students agree with the following statements: “When I am failing, I worry about what others think of me”, “When I am failing, I am afraid that I might not have enough talent” and “When I am failing, this makes me doubt my plans for the future”. A positive value of this index means

that students expressed a greater fear of failure than the average student of OECD (OECD, 2019).

Figure 2.23. represents the distribution of the index of fear of failure, in terms of density and by gender. Both the median and the mean are higher for girls than boys. It indicates that on average girls are more afraid of failure, but also that it is true for more than 50% of the girls. The maxima and the minima are the same for boys and girls. The standard deviation is higher for girls than boys. It tends to confirm that there is a relationship between fear of failure and gender. It also corroborates the idea that girls have a higher fear of failure. While boys have a lower fear of failure than the OECD average, girls have a higher fear of failure than the OECD average.

3 CHAPTER 3: APPROACH AND RESULTS

To verify my hypotheses, there are two main empirical approaches I adopt, the first using simple correlation tables, and the second using regressions. I use correlation tables to give a first look at the data and the relationship between the variables. Then, I apply regressions to the variables because it is the most common and effective way to measure the relationship between variables. Moreover, as I have two categorical dependent variables, I need to consider logistic regressions for them.

The set-up of this Chapter is as follows. As a starting point, I provide and develop general correlation tables for all variables. I also present correlation tables by gender for gender-related determinants and measures of performance. Then, I develop different regressions and their results for the three dependent variables. Finally, I summarize the different results. The guideline of the analysis is the check of my two hypotheses presented in Chapter 1.

3.1 CORRELATIONS

The objective of this section is not to answer my hypotheses but rather to look at the relationships between variables. For occupational aspirations, I may simply use classic correlations as occupational aspirations are measured by a real number. For educational aspirations, I have to use Spearman's correlation as educational aspirations are measured by an ordinal variable. I mainly focus on the signs of the relationships and check if they are aligned with expectations based on literature. For the situation in 5 years, I cannot measure correlation. When the independent variable is a categorical variable, I use a Chi-square test of independence. Otherwise, I can only look at the value of the independent variable with respect to the mean for the different categories of the dependent variable. It is important to notice that a couple of papers from the literature actually do not go further than general correlation tables or correlation tables by categories in their analysis (Haller, Otto, Meier, & Ohlendorf, 1974; Marini & Greeberger, 1978; Beal & Crockett, 2010).

Table 3.1. presents the coefficients described above between the three dependent variables and other variables of the database. Starting with the top of the table, occupational aspirations and educational aspirations are positively correlated. Educational aspirations are related to the situation in 5 years. Finally, when occupational aspirations are higher, students are more likely to choose "I will be studying because I do not know what I would like to do yet" and "I will be studying because the occupation I want requires a study degree". It makes sense that students with higher educational aspirations have higher occupational aspirations and conversely. It is also not surprising to see that students with higher occupational aspirations are more likely to study in 5 years.

Considering individual and socioeconomic determinants, performances and socioeconomic status are positively correlated with aspirations. Students with higher performances are more likely to study in 5 years. It is aligned with my expectations. Also, students with higher performance in math are more likely to choose "I will be working because I need to be financially independent".

Looking at parental determinants, for all determinants and all measures of aspirations, the relationship is positive. Again, there is no surprise in the signs of these relationships. Parental expectations and education are related to the situation in 5 years. The higher the involvement of parents and the higher their level of occupation, the more likely the student chooses “I will be studying because I do not know what I would like to do yet” and “I will be studying because the occupation I want requires a study degree”. The fact that women as a higher occupational status than the father or not is related to the situation in 5 years.

Table 3.1. General correlation between the three dependent variables and the other variables of the database (Belgium, 2018)

	Educational aspirations	Occupational aspirations	Situation in 5 years					
			1	2	3	4	5	6
Educational aspirations	1							
Occupational aspirations	0.53	1	-	-	+	+	-	-
INDIVIDUAL								
Performance in math	0.50	0.38	-	+	+	-	-	-
Performance in reading	0.50	0.41	-	-	+	+	-	-
Performance in science	0.50	0.39	-	-	+	+	-	-
SOCIOECONOMIC								
Socioeconomic status	0.38	0.23	-	-	+	+	-	-
PARENTAL								
Expectations	0.57	/				V		
Level of education	0.28	0.14				V		
Involvement	0.13	/	-	-	+	+	-	-
Occupation	0.32	0.22	-	-	+	+	-	-
Occupation mother vs father	0.12	0.06				V		
SCHOOL								
Size	0.22	0.03	+	+	+	+	-	+
Type of education	-0.41	-0.46				V		
Quality of the teacher	0.11	/	-	-	-	+	-	-
Encouragement of the teacher	-0.06	-0.03	+	+	-	-	-	-
School resources	0.04	-0.01	-	+	+	-	+	-
Information on career	-0.05	-0.13	+	+	-	-	-	+
SOCIAL GROUP								
Migrant	-0.04	0.06				V		
Language	-0.08	-0.01				V		
GENDER-RELATED								
Gender	-0.10	-0.18				V		
Gender-typical occupations	0.24	0.44	-	-	+	+	-	--
Self-concept	0.19	0.19	-	-	-	+	-	-
Competitiveness	0.07	0.03	-	+	-	+	+	+
Fear of failure	0.06	/	-	-	+	+	-	-

Note: / means that it is not possible to compute a coefficient of correlation between these two variables. V means that the dependent variable and the independent variable are related (reject the independence). + means that the average value of the independent variable for this value of the dependent variable is higher than the overall mean of the independent variable. - means that the average value of the independent variable for this value of the dependent variable is lower than the overall mean of the independent variable.

Source: data from PISA 2018

Studying the school determinants, the results are aligned with expectations for the size, the type of education and the quality of the teacher. Also, the situation in 5 years is related to the type of education. The results for the size do not bring many insights and students are more likely to study in 5 years when the quality of the teacher is higher. Nevertheless, results for the encouragement of the teacher, school resources and information and career contradicts expectations. The coefficients should be positive and are actually negative in most cases. The results also contradict expectations for the situation in 5 years, encouragement of teacher and information on career makes students more likely to work in 5 years. And the results on school resources do not bring many insights.

Analysing the social group determinants, literature predicts negative coefficients on the variable reflecting immigration background and the variable reflecting the fact that the language mainly spoken at home is different from the language of the test. The results support the expectations for the language but not for the migration background as the coefficients are positive for occupational aspirations. Both the immigration background and the language spoken at home are related to the situation in 5 years.

Finally, focusing on gender-related determinants, the results are not surprising for the self-concept and competitiveness. However, the results of gender-typical occupations would imply that students having more gender-typical aspirations have higher educational and occupational aspirations. Also, fear of failure increases aspirations and being a boy reduces aspirations. While literature predicts the opposite. Gender is related to the situation in 5 years. Although there is no clear pattern for competitiveness, students with higher fear of failure, higher self-concept or more gender-typical aspirations are more likely to study in 5 years.

As gender-related determinants are likely to have different impacts on the aspirations depending on the gender, Table 3.2. presents the coefficients of correlations between the aspirations and gender-related determinants by gender. For the variable reflecting gender-typical occupations, the relationships with the aspirations are more positive for girls than boys. Literature predicts that boys are more likely to choose gender-typical occupations and it results in lower aspirations for girls. Here, we have the opposite.

Table 3.2. Correlation between the three dependent variables and the gender-related determinants by gender (Belgium, 2018)

	Educational aspirations		Occupational aspirations	
	Girls	Boys	Girls	Boys
Gender-typical occupations	0.26	0.19	0.46	0.39
Self-concept	0.21	0.16	0.22	0.15
Fear of failure	0.05	0.03	/	/
Competitiveness	0.07	0.11	0.04	0.06

Note: / mean that it is not possible to compute a coefficient of correlation between these two variables.

Source: data from PISA 2018

For the variable evaluating self-concept, the literature predicts that girls have lower self-concept than boys and it implies lower aspirations for girls. The results show that the relationship between aspirations and self-concept is stronger for girls. For the variable measuring the fear of failure, the relationships with the educational aspirations are always positive, which

contradicts literature. Moreover, it seems that fear of failure has more impact on aspirations for girls. Finally, competitiveness is positively correlated with aspirations and the relationships are stronger for boys. It corroborates what literature predicts.

From general correlations, performances are positively correlated with the level of aspirations. As hypothesis 2 mentions a difference in the relationships between performances and aspirations for boys and girls, it is interesting to look at correlation by gender. Table 3.3. presents the coefficients of correlation between the three dependent variables and the performances by gender. The coefficients show that the relationships between aspirations and performances vary by gender. However, the impact of performances is stronger for girls for educational aspirations and stronger for boys for occupational aspirations. The expectations would be a stronger relationship for boys for both types of aspirations.

Table 3.3. Correlation between the three dependent variables and the performances by gender (Belgium, 2018)

	Educational aspirations		Occupational aspirations	
	Girls	Boys	Girls	Boys
Performance in reading	0.4320	0.4166	0.3922	0.4134
Performance in math	0.4498	0.4297	0.3894	0.4155
Performance in science	0.4423	0.4298	0.3952	0.4185

Note: I do not consider the situation in 5 years as it is more difficult to interpret, and it does not bring additional insights here.

Source: data from PISA 2018

3.2 REGRESSIONS

The objective of this section is clearly to answer my hypotheses by looking at the results of the different regressions and their significance. While some papers do not go further than correlations tables, a couple of more recent papers use regressions or logistic regressions to analyse aspirations and their determinants (Cochran, Wang, Stevenson, Johnson, & Crews, 2011; Gemici, Bednarz, Karmel, & Lim, 2014). The benefits of using regressions compared to correlation tables are multiple. While correlation tables only provide a coefficient between -1 and 1, regressions give an entire equation with the significance of each relationship. The equation allows predicting the value of the dependent variable for given values of the independent variables. Although the objective of regressions is to find causal relationships, the different regressions, in this case, allow to measure the correlation between variables, but it is not possible to infer causality as I cannot exclude endogeneity.

3.2.1 Educational aspirations

The variable measuring educational aspirations is a categorical variable and this variable can be ordered logically. Therefore, I used an ordered logistic model to estimate the relationships between different determinants and educational aspirations. Although pseudo- R^2 cannot be interpreted as classical R^2 , the higher the pseudo- R^2 , the better. The coefficients cannot be

interpreted as in OLS regressions as the marginal effect of the variable. Therefore, I focus on the signs⁶ and significance of the variables and I develop marginal effects for a couple of variables later. When I say that a coefficient is statistically significant, I mean that it is at least significant at 10% level.

Table 3.4. presents the results of the ordered logistic regressions. The first regression focusses on my variables of main interest: performances and gender-related determinants. Whereas regressions 2 to 5 add each group of determinants one by one. The objective is to see the relative importance of each group in explaining educational aspirations and to check the robustness of the results of the first regression.

Firstly, let us look at the first model presented in the second column. There are 4440 observations and the pseudo- R^2 is equal to 0.1412. For individual determinants, the signs on performance in math and reading are as expected and the coefficients are statistically significant. The sign on performance in science contradicts expectations, but the coefficient is not statistically significant. For gender-related determinants, the coefficient on gender is negative and statistically significant. It implies that girls have higher educational aspirations than boys, which contradicts expectations. The impacts of self-concept and competitiveness are more important for boys than girls as the coefficients on the interaction terms are positive and statistically significant. Finally, the impact of the fear of failure seems less important for boys but the coefficient is not statistically significant.

Secondly, considering models 2 to 5, the inclusion of socioeconomic and parental determinants does not change the sign and the statistical significance of the coefficients on performances and gender-related determinants. However, controlling for school determinants reduces the statistical significance of performance in math and reading, the gender and the interaction term between gender and self-concept. And the social group determinants do not affect the sign and the statistical significance of my main interest variables. Therefore, it seems that results from model 1 are relatively robust to the inclusion of control variables, except for school determinants. Looking at pseudo- R^2 , it seems that parental determinants are important to explain educational aspirations. It is also observable that parental determinants and school determinants play an important role in the low number of observations of the complete model (model 5).

Lastly, let us look at the fifth model presented in the last column. There are 1860 observations and the pseudo- R^2 is equal to 0.2589. For socioeconomic determinant, the sign on the socioeconomic status is positive, as expected. The coefficient is statistically significant.

⁶ The direction of the effect is not determined entirely by the coefficients for intermediate outcomes. Nevertheless, I verified the compatibility of my interpretation based on the coefficients (Table 3.4.) and the marginal effects (Table A.3.1. in appendix). There is no problem except for performance in reading and parental expectations (for second degree of secondary).

Table 3.4. Ordered logistic regressions – educational aspirations (Belgium, 2018)

	1	2	3	4	5
INDIVIDUAL					
Performance math	0.014***	0.012***	0.007***	0.005**	0.005**
Performance reading	0.002**	0.002**	0.002**	0.002	0.002
Performance science	-0.002	-0.002*	-0.001	-0.001	-0.001
SOCIOECONOMIC					
Socioeconomic status		0.469***	0.386**	0.529**	0.542**
PARENTAL					
Expectations ref=1					
2			-1.401***	-0.773*	-0.767*
3			-0.534*	-0.0248	-0.011
4			-0.768**	-0.271	-0.245
5			0.349	0.848**	0.865**
6			1.886***	2.316***	2.294***
Level of education ref=0					
1			-0.911	-0.833	-0.834
2			-1.170*	-1.601**	-1.583**
3			-1.370**	-1.318*	-1.272*
4			-1.412**	-1.507**	-1.444**
5			-1.256**	-1.435**	-1.383**
6			-0.916*	-1.303*	-1.255*
Involvement			0.136**	0.120*	0.117*
Occupation			-0.006*	-0.006	-0.006
Mother vs father ref=0			0.008	0.048	0.056
SCHOOL					
Size				-0.019	-0.019
Type of education ref=1					
2				/	/
3				-0.698***	-0.694***
Quality of the teacher				0.045	0.039
Support of the teacher				-0.097*	-0.100*
School resources				0.0437	0.048*
Information on career				0.0248	0.027
SOCIAL GROUP					
Migrant ref=1					
2					0.186
3					0.105
Language X Migrant					0.033
GENDER-RELATED					
Male ref=female	-0.639***	-0.655***	-0.306***	-0.221*	-0.227*
Gender-typical occupations X Gender	/	/	/	/	/
Self-concept X Gender	0.133***	0.141***	0.144***	0.138**	0.135**
Competitiveness X Gender	0.155***	0.152***	0.114***	0.161***	0.160***
Fear of failure X Gender	0.005	-0.001	0.004	-0.019	-0.017
Nobs	4440	4420	3548	1868	1860
Pseudo R ²	0.1412	0.1546	0.2437	0.2590	0.2589

Notes: *p<0.10, **p<0.05, ***p<0.01. X means that I interact the first variable with the second. For parental expectations: 1 = first degree of secondary. For parental education: 0 = none. For mother vs father: 0 = father has higher occupational level than mother. For type of education: 1 = general. For migrant: 1 = native. For gender: 1 = girls.

Source: data from PISA 2018

For parental determinants, it seems that parental expectations have a negative effect compared to the reference when they are low and a positive effect when they are high. However, the coefficients on 3 (second degree of secondary) and 4 (third degree of secondary) are not statistically significant. Very surprisingly, for the level of education of parents, all coefficients are negative and most of them are statistically significant. When parents have a higher level of education than the reference, students have lower educational aspirations. As the coefficient on involvement is positive and statistically significant, parents' involvement tends to increase the level of aspirations of students. The sign on occupation contradicts expectations while the sign on the difference between the mother and the father confirms expectations, but both are not statistically significant.

For school determinants, the coefficient on school size is negative but not statistically significant. Students in vocational education have lower aspirations, as the coefficient on vocational education is negative and statistically significant. The coefficients on the quality of the teacher and the information on career are positive but not statistically significant. Surprisingly, the coefficient on the support of the teacher is negative and statistically significant. It would imply that students more encouraged by their teachers have lower educational aspirations. The students in a school with higher resources have higher educational aspirations, as the coefficient on school resources is positive and statistically significant.

For social group determinants, no coefficient is statistically significant. The coefficients on first-generation and second-generation students are positive, at the contrary of expectations. Concerning the interaction term, language is equal to 1 when the language spoken at home is different from the language of the test. The coefficient is as expected, positive.

Marginal effects of performances and gender

The problem with logistic regressions is that it is difficult to interpret the marginal effect of an independent variable on a dependent variable, based on reported coefficients. Nevertheless, it is possible to calculate this marginal effect. Here, the marginal effect for an average student is considered. Table 3.5. presents the results for some key variables: performance and gender. These variables are key because they appear in hypothesis 1 and hypothesis 2. I do not look at the marginal effect of other variables because it would confuse readers and not bring additional insights.

For performance in math, the marginal effects say that the average student is less likely to aspire to the first degree of secondary by 0.0004% if he has a one-unit increase in his score. Also, he is less likely to aspire to the second degree of secondary (by 0.001%), the third degree of secondary (by 0.0017%), the seventh year of secondary (by 0.0021%) and bachelor (by 0.0016%). Finally, the average student is more likely to aspire to master by 0.0069% if he has a one-unit increase in his score. For performance in reading and science, the coefficients are not statistically significant.

Table 3.5. Marginal effect of performances and gender on educational aspirations (Belgium, 2018)

	Educational aspirations					
	1	2	3	4	5	6
Performance in math	-0.00004**	-0.00010**	-0.00017**	-0.00021**	-0.00016**	0.00069**
Performance in reading	-0.00002	-0.00004	-0.00008	-0.00009	-0.00007	0.00031
Performance in science	0	0.00002	0.00003	0.00004	0.00003	-0.00014
Gender ref=1	0.00171*	0.00464*	0.00763*	0.00998*	0.00762*	-0.03159*

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. For gender: 1 = girls.

Source: data from PISA 2018

For gender, the marginal effects say that the average male student is more likely to aspire to the first degree of secondary than female students, by 0.0171%. Also, he is more likely to aspire to the second degree of secondary (by 0.0464%), the third degree of secondary (by 0.0763%), the seventh year of secondary (by 0.0998%) and bachelor (by 0.0762%). Finally, the average male student is less likely to aspire to master than female students by 0.3159%.

3.2.2 Occupational aspirations

The variable measuring occupational aspirations is a continuous variable. Therefore, I used a classic OLS model to estimate the relationships between different determinants and occupational aspirations. When I say that a coefficient is statistically significant, I mean that it is at least significant at 10% level. Table 3.6. presents the results of the regressions. The first regression focusses on my variables of main interest: performances and gender-related determinants. Whereas regressions 2 to 5 add each group of determinants one by one. The objective is to see the relative importance of each group in explaining educational aspirations and to check the robustness of the results of the first regression.

Firstly, let us look at the first model presented in the second column. There are 2541 observations and the pseudo- R^2 is equal to 0.3240. For individual determinants, the signs on performance in math, reading and science are as expected and the coefficients are statistically significant. For gender-related determinants, the coefficient on gender is negative and statistically significant. It implies that girls have higher occupational aspirations than boys, which contradicts expectations. The impacts of self-concept and competitiveness are more important for boys than girls as the coefficients on the interaction terms are positive and statistically significant. Finally, the impact of gender-typical observations is stronger for boys than girls as the coefficient is positive and statistically significant.

Secondly, considering models 2 to 5, the inclusion of socioeconomic and parental determinants does not change the sign and the statistical significance of the coefficients on performances and gender-related determinants, except for the interaction term between gender and competitiveness. However, controlling for school determinants reduces the statistical significance of performance in math, reading and science, and the interaction term between gender and self-concept. And the social group determinants do not affect the sign and the statistical significance of my main interest variables, except the performance in science which becomes again statistically significant. Therefore, it seems that results from model 1 are

Table 3.6. OLS regressions – occupational aspirations (Belgium, 2018)

	1	2	3	4	5
INDIVIDUAL					
Performance math	0.033**	0.025**	0.025**	-0.001	-0.007
Performance reading	0.028**	0.030**	0.031**	0.028*	0.025*
Performance science	0.023*	0.022*	0.023*	0.019	0.032*
SOCIOECONOMIC					
Socioeconomic status		1.333**	0.454	2.238	2.989**
PARENTAL					
Expectations ref=1					
2			/	/	/
3			/	/	/
4			/	/	/
5			/	/	/
6			/	/	/
Level of education ref=0					
1			-4.331	1.841	2.797
2			-12.232**	-9.924	-7.329
3			-12.094**	-8.132	-5.298
4			-10.146**	-9.525	-6.769
5			-9.428**	-9.391	-6.943
6			-8.211*	-7.642	-5.541
Involvement			/	/	/
Occupation			0.035	-0.019	-0.024
Mother vs father ref=0			-0.147	-0.158	-0.008
SCHOOL					
Size				-0.001	-0.011
Type of education ref=1					
2				-10.224**	-11.69***
3				-10.864***	-10.24***
Quality of the teacher				/	/
Support of the teacher				-0.635	-0.584
School resources				-0.033	-0.031
Information on career				-0.045	-0.106
SOCIAL GROUP					
Migrant ref=1					
2					3.073**
3					6.378**
Language X Migrant					0.485
GENDER-RELATED					
Male ref=female	-11.489***	-11.361***	-11.357***	-8.686***	-8.711***
Gender-typical occupations X Gender	0.137***	0.136***	0.131***	0.118***	0.114***
Self-concept X Gender	0.691**	0.649**	0.577**	0.311	0.173
Competitiveness X Gender	0.483**	0.501**	0.348	0.309	0.148
Fear of failure X Gender	/	/	/	/	/
Constant	19.227***	22.569***	29.717***	51.608***	46.334***
Nobs	2541	2525	2382	1117	1107
R ²	0.3240	0.3262	0.3314	0.3822	0.3927

Notes: *p<0.10, **p<0.05, ***p<0.01. X means that I interact the first variable with the second. For parental expectations: 1 = first degree of secondary. For parental education: 0 = none. For mother vs father: 0 = father has higher occupational level than mother. For type of education: 1 = general. For migrant: 1 = native. For gender: 1 = girls.

Source: data from PISA 2018

relatively robust to the inclusion of control variables, except for school determinants. Looking at pseudo- R^2 , it seems that school determinants are important to explain occupational aspirations. It is also observable that school determinants play an important role in the low number of observations of the complete model (model 5).

Lastly, let us look at the fifth model presented in the last column. There are 1107 observations and the R^2 is equal to 0.3927. It implies that 39% of the variations in occupational aspirations are explained by the model. For socioeconomic determinant, the sign on the socioeconomic status is positive, as expected. The coefficient is statistically significant.

For parental determinants, very surprisingly, for the level of education of parents, almost all coefficients are negative but none of them is statistically significant. The signs on occupation and the difference between the mother and the father contradict expectations, but both are not statistically significant.

For school determinants, the coefficient on school size is negative but not statistically significant. Students in vocational education and pre-vocational education have lower aspirations, as the coefficient on vocational and pre-vocational education are negative and statistically significant. Surprisingly, the coefficient on the support of the teacher is negative but not statistically significant. Both the coefficients on school resources and information on career are surprisingly negative but not statistically significant.

For social group determinants, it seems that first- and second-generation migrants have higher occupational aspirations than native students, as the coefficients on first- and second-generation migrants are positive and statistically significant. The coefficient on the interaction term is positive as expected but not statistically significant.

Marginal effects of performances and gender

The advantage of OLS regressions is that it is possible to observe easily the marginal effect of an independent variable on a dependent variable. For performance in math, the coefficient is not statistically significant. For performance in reading and science, a one-unit increase in performances increases occupational aspirations by 0.025 and 0.032. For gender, occupational aspirations are lower by 8.711 for boys.

3.2.3 Situation in 5 years

The variable measuring situation in 5 years is a categorical variable and this variable cannot be ordered logically. Therefore, I used a multinomial logistic model to estimate the relationships between the different determinants and the situation in 5 years. By using a Hausman McFadden test, I can confirm that the assumption of independence of irrelevant alternatives holds at 5% level. Although pseudo- R^2 cannot be interpreted as classical R^2 , the higher the pseudo- R^2 , the better. The coefficients cannot be interpreted as in OLS regressions as the marginal effect of the variable. Therefore, I focus on the signs⁷ and significance of the variables and I develop

⁷ The direction of the effect is not determined entirely by the coefficients for intermediate outcomes. Nevertheless, I verified the compatibility of my interpretation based on the coefficients (Table 3.4.) and the marginal effects (Table A.3.2. in appendix). There is no problem.

marginal effects for a couple of variables later. When I say that a coefficient is statistically significant, I mean that it is at least significant at 10% level.

Table 3.7. presents the results of the multinomial logistic regression. Each column measures the effect of the independent variables on one value of the dependent variable. As there are 6 different values for this variable, there are 5 columns and 1 reference value. Here the reference value is 4 which corresponds to the answer “I will be studying because the occupation I want requires a study degree”. The choice of this value as the reference is explained by the fact that studying for working can be considered as the classical path. First, let us look at the common elements for all columns. There are 1187 observations and the pseudo- R^2 is equal to 0.1494.

For individual determinants, the signs on performance in math for the different values of the dependent variable are all positive but only two are statistically significant. The positive value on the coefficient when the dependent variable is equal to 3 and 5 indicates that students with higher performance in math are more likely to choose “I will be studying because I do not know what I would like to do yet” and “I will be studying or working for other reasons” than the reference. The coefficients on performance in reading are in most cases negative, except when the value of the dependent variable is 5. They are also statistically significant, except when the dependent variable is 6. The negative value on the coefficient when the dependent variable is equal to 1, 2 and 3 indicates that students with higher performance in reading are less likely to choose “I will be working because the occupation I want does not require a study degree”, “I will be working because I need to be financially independent” and “I will be studying because I do not know what I would like to do yet” than the reference. While the positive value on the coefficient when the dependent variable is equal to 5 indicates that students with higher performance in reading are more likely to choose “I will be studying or working for other reasons” than the reference. Only one coefficient on the performance in science is statistically significant and it is negative. It indicates that students with higher performance in science are less likely to choose “I will be studying or working for other reasons” than the reference.

For socioeconomic determinant, the signs of the coefficients on the socioeconomic status are only statistically significant in two cases where the coefficients are negative. It indicates that students with higher socioeconomic status are less likely to choose “I will be working because I need to be financially independent” and “I will be studying because I do not know what I would like to do yet” than the reference.

For parental determinants, few coefficients on parental expectations are statistically significant. First, when parents’ expectations are the second degree of secondary, students are more likely to choose “I will be working because I need to be financially independent” over the reference, than students whose parents’ expectations are first degree of secondary. The opposite holds when parents’ expectations are master. Second, when parents’ expectations are the second degree of secondary, students are more likely to choose “I will be studying because I do not know what I would like to do yet” over the reference, than students whose parents’ expectations are first degree of secondary. Third, when parents’ expectations are master, students are less likely to choose “I will be studying or working for other reasons” over the reference, than students whose parents’ expectations are first degree of secondary. The level of parents’ education is never statistically significant. There are only two statistically significant coefficients on involvement, they are both negative. It means that students with higher parental

involvement are less likely to choose “I will be working because the occupation I want does not require a study degree” and “I will be doing something else” than the reference group. There is only one statistically significant coefficient on the difference between father and mother, it is positive. It indicates that when the mother has a higher or equal level of occupation than the father, students are more likely to choose “I will be working because I need to be financially independent” over the reference, than students whose mother has a lower level of occupation than the father.

For school determinants, all coefficients on school size are not statistically significant. There is only one statistically significant coefficient on type of education, it is negative. It implies that when students are enrolled in vocational education, they are less likely to choose “I will be studying because I do not know what I would like to do yet” over the reference than students enrolled in general education. There are two statistically significant and negative coefficients on the quality of the teacher. It means that students with higher teacher support are less likely to choose “I will be working because the occupation I want does not require a study degree” and “I will be doing something else” than the reference. Only two coefficients on school resources are statistically significant and they are positive. It indicates that students in a school with more resources are more likely to choose “I will be working because the occupation I want does not require a study degree” and “I will be working because I need to be financially independent” than the reference. All coefficients on information on career are not statistically significant.

For social group determinants, all coefficients are not statistically significant both on migration background and on the interaction term.

For gender-related determinants, three coefficients on gender are statistically significant among which two are positive and one is negative. It means that boys are more likely to choose “I will be working because I need to be financially independent” and “I will be doing something else” over the reference, than girls. While, boys are less likely to choose “I will be studying because I do not know what I would like to do yet” over the reference, than girls. Two coefficients on the interaction term with self-concept are statistically significant and negative. It implies that boys with higher self-concept are less likely to choose “I will be studying because I do not know what I would like to do yet” and “I will be studying or working for other reasons” over the reference, than girls. There are no statistically significant coefficients on the interaction term with competitiveness. Finally, there are two negative and statistically significant coefficients on the interaction term with fear of failure. It implies that boys with higher fear of failure are less likely to choose “I will be working because the occupation I want does not require a study degree” and “I will be working because I need to be financially independent” over the reference, than girls.

Table 3.7. Multinomial logistic regression – situation in 5 years (Belgium, 2018)

		1	2	3	5	6
INDIVIDUAL						
Performance math		0.003	0.001	0.004*	0.009**	0.007
Performance reading		-0.010**	-0.005*	-0.006**	0.006*	-0.005
Performance science		-0.004	-0.003	0.002	-0.015***	-0.008
SOCIOECONOMIC						
Socioeconomic status		-0.187	-0.831**	-0.658**	-0.404	0.277
PARENTAL						
Expectations ref=1						
	2	0.573	1.429*	1.434*	1.223	14.783
	3	0.283	1.156	0.919	0.539	13.124
	4	0.827	1.061	0.704	0.507	14.191
	5	-0.869	-0.137	0.472	-0.352	12.970
	6	-1.460	-1.391*	-0.183	-1.399*	12.791
Level of education ref=0						
	1	0.094	1.546	0.740	-0.339	0.599
	2	0.528	1.715	1.000	0.720	14.852
	3	-0.341	0.950	0.155	-1.211	13.039
	4	-0.195	1.400	1.091	-0.572	13.410
	5	-0.649	1.248	1.414	-0.391	12.674
	6	-0.454	1.883	1.731	-0.331	13.086
Involvement		-0.323**	-0.085	-0.014	-0.047	-0.469*
Occupation		0.005	0.020**	0.009	0.007	0.010
Mother vs father ref=0		0.031	0.357*	0.050	-0.111	-0.067
SCHOOL						
Size		0.033	0.021	0.045	-0.011	0.020
Type of education ref=1						
	2	/	/	/	/	/
	3	0.442	-0.033	-0.377**	0.393	0.172
Quality of the teacher		-0.139	-0.287**	-0.235**	-0.183	0.010
Support of the teacher		-0.083	-0.157	0.020	-0.228*	-0.326*
School resources		0.104**	0.115**	0.015	0.039	-0.040
Information on career		-0.052	-0.002	-0.038	-0.131	0.162
SOCIAL GROUP						
Migrant ref=1						
	2	-0.139	0.454	0.332	0.257	-0.449
	3	-0.253	0.365	-0.067	0.659	0.172
Language X Migrant		0.134	-0.104	-0.082	0.016	0.042
GENDER-RELATED						
Gender ref=1		0.242	0.458**	-0.248*	0.300	0.989**
Gender-typical occupations X Gender		/	/	/	/	/
Self-concept X Gender		-0.105	-0.092	-0.120**	-0.187**	-0.154
Competitiveness X Gender		0.087	0.002	-0.089	0.126	-0.024
Fear of failure X Gender		-0.131*	-0.217**	-0.042	-0.114	-0.104
Constant		2.543	-2.054	-3.472**	-1.623	-28.789
Nobs				1187		
Pseudo R ²				0.1494		

Notes: *p<0.10, **p<0.05, ***p<0.01. X means that I interact the first variable with the second. For parental expectations: 1 = first degree of secondary. For parental education: 0 = none. For mother vs father: 0 = father has higher occupational level than mother. For type of education: 1 = general. For migrant: 1 = native. For gender: 1 = girls.

Source: data from PISA 2018

Marginal effects of performances and gender

The multinomial logistic regression has the same problem as the ordered logit regression, in terms of the interpretation of the marginal effect. Nevertheless, it is also possible to calculate this marginal effect. Here, the marginal effect for an average student is considered. Table 3.8. presents the results for some key variables: performance and gender.

Table 3.8. Marginal effect of performances and gender on educational aspirations (Belgium, 2018)

	Situation in 5 years					
	1	2	3	4	5	6
Performance in math	0.00007	-0.00009	0.00062	-0.00103*	0.00038	0.00006
Performance in reading	-0.00044*	-0.00019	-0.00116*	0.00126**	0.00056**	-0.00002
Performance in science	-0.00020	-0.00017	0.00098	0.00033	-0.00086*	-0.00008
Gender ref=1	0.01462	0.03926	-0.08627	0.00219	0.01828	0.01191*

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. For gender: 1 = girls.

Source: data from PISA 2018

For performance in math, only one coefficient is statistically significant. And the marginal effect says that the average student is less likely to choose “I will be studying because the occupation I want requires a study degree” by 0.0103% if he has a one-unit increase in his score. For performance in reading, four coefficients are statistically significant, two are positive and two are negative. The marginal effects say that the average student is less likely to choose “I will be working because the occupation I want does not require a study degree” and “I will be studying because I do not know what I would like to do yet” if he has a one-unit increase in his score. While the average student is more likely to choose “I will be studying because the occupation I want requires a study degree” and “I will be studying or working for other reasons” if he has a one-unit increase in his score. For performance in science, only one coefficient is statistically significant and negative. The marginal effect says that the average student is less likely to choose “I will be studying or working for other reasons” by 0.0086% if he has a one-unit increase in his score.

For gender, only one coefficient is statistically significant and positive. The marginal effect says that the average male student is more likely to choose “I will be doing something else” than female students by 0.1191%.

3.2.4 Interaction between gender and performances

To test hypothesis 2, it is important to look at the interaction between performances and gender because it allows measuring to what extent performances affect differently aspirations for each gender. From now on, I do not consider the situation in 5 years as multinomial logistic regressions are very difficult to interpret with interaction terms and I prefer to focus on educational and occupational aspirations. Table 3.9. presents the results of the ordered logistic regression and the classic OLS regression for educational and occupational aspirations and adding interaction terms for performances and gender to model 5.

For performance in reading, the impact on aspirations is positive and statistically significant for girls but not statistically significant for boys. For performance in math, the impact on educational aspirations is positive and statistically significant for both boys and girls. However, the impact on occupational aspirations is not statistically significant whatever the gender. For performance in science, the coefficient is not statistically significant for both girls and boys and both educational and occupational aspirations.

Table 3.9. Interactions between gender and performances – ordered logistic regression and classic OLS regression (Belgium, 2018)

		Educational aspirations	Occupational aspirations
Performance reading X Gender			
	1	0.0041*	0.0350*
	2	0.0006	0.0159
Performance math X Gender			
	1	0.0045*	-0.0152
	2	0.0053**	0.0025
Performance science X Gender			
	1	-0.0023	0.0291
	2	0.0002	0.0344
Controls		Socioeconomic determinant, parental determinants, school determinants, social group determinants and gender-related determinants	Socioeconomic determinant, parental determinants, school determinants, social group determinants and gender-related determinants
Nobs		1860	1107
Pseudo R ² or R ²		0.2592	0.3931

Notes: *p<0.10, **p<0.05, ***p<0.01. For gender: 1 = girls and 2 = boys.

Source: data from PISA 2018

Marginal effect of the interaction

For occupational aspirations, the marginal effects can be observed via the coefficients of the regression. The only statistically significant coefficient is the coefficient on the interaction between gender and performance in reading and girls. The female students that have higher performance in reading have a higher score of occupational aspirations by 0.035.

For educational aspirations, the marginal effects have to be computed. Table 3.10. presents the results. The coefficients are only significant for the interaction between performance in reading and gender. The marginal effects say that the average male student is less likely to aspire to a level of education below or equal to bachelor than female students if he has a one-unit increase in his score. Precisely, he is 0.0004% less likely to aspire to the first degree of secondary, 0.0010% less likely to aspire to the second degree of secondary, 0.0017% less likely to aspire to the third degree of secondary, 0.0021% less likely to aspire to the seventh year of secondary and 0.0015% less likely to aspire to the bachelor. However, the average male student is more likely by 0.0068% to aspire to master than female students, if he has a one-unit increase of his score.

Table 3.10. Marginal effect of the interaction between performances and gender on educational aspirations (Belgium, 2018)

	Educational aspirations					
	1	2	3	4	5	6
Gender ref=1						
Gender X performance in reading	-0.00004**	-0.00010**	-0.00017**	-0.00021**	-0.00015*	0.00068**
Gender X performance in math	-0.00001	-0.00004	-0.00007	-0.00010	-0.00010	0.00034
Gender X performance in science	0	0.00002	0.00003	0.00005	0.00006	-0.00016

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. For gender: 1 = girls.

Source: data from PISA 2018

3.3 SUMMARY OF THE RESULTS

The last section of this chapter is dedicated to hypotheses. The objective of this section is to summarize all results regarding my two hypotheses, shortly. All coefficients are detailed and explained in previous Sections; therefore, I do not detail them again. This summary is particularly useful for the next chapter devoted to the discussion of the results.

3.3.1 Hypothesis 1

Hypothesis 1: Elements in Table 1.3. are correlated with the level of educational and occupational aspirations. And beyond the other determinants of Table 1.3., gender-related determinants are correlated with the level of educational and occupational aspirations.

Table 11. reproduces Table 1.3. by adding the two last columns. The third column states if the hypothesis is verified and the fourth column mentions how I arrive in confirming or infirming the hypothesis. The elements in italic are not verifiable using PISA database, therefore, I eliminate them from the table. For some variables, the conclusion comes from the econometric analysis and for others, the decision arises from the data description. And beyond the other determinants of Table 1.3., gender-related determinants are correlated with the level of educational and occupational aspirations. The results are relatively robust.

Table 3.11. Determinants of aspirations – results (Belgium, 2018)

	Determinants	Educational aspirations	Occupational aspirations	Situation in 5 years	Method
Individual determinants	performance in reading	X	V	V	Econometric analysis
	performance in math	V	X	V	
	performance in science	X	V	V	
	extracurricular activities	/	V	/	Data description
Socioeconomic determinants	socioeconomic status	V	V	V	Econometric analysis

Parental determinants	expectations	V	/	X	Econometric analysis
		/	V	/	Data description
	level of education	0	X	X	Econometric analysis
	involvement	V	/	0	
	occupation	X	X	0	
	mother vs father	X	X	0	
Scholar determinants	size	X	X	X	Econometric analysis
	type of education	V	V	0	
	quality of the teacher	X	/	V	
	encouragement of the teacher	0	X	V	
	resources	V	X	0	
	information on labour market and careers	X	X	X	
	peer effect	/	0	/	Data description
Social group determinants	migrant	X	0	X	Econometric analysis
	language	X	X	X	
Social determinants	access to university	/	V	/	Data description
Gender-related determinants	opportunities	/	V	/	Data description
	gender-typical occupations	/	V	X	Econometric analysis
	self-concept	0	X	X	
	competitiveness	V	X	X	
	fear of failure	X	/	V	

Notes: X means no statistically significant relationship. 0 means statistically significant relationship but the sign of the relationship is not as expected. V means statistically significant relationship and the sign of the relationship is as expected. / means it is not possible to analyse the relationships between these two variables.

Source: data from PISA 2018

3.3.2 Hypothesis 2

Hypothesis 2: The level of aspirations is not aligned on performance to PISA tests and gender makes a difference in the relationship.

The first part of the hypothesis states that the level of aspirations is not aligned on performance to PISA tests. This hypothesis is partly validated. The level of educational aspirations is not related to performance in reading and science. While the level of occupational aspirations is not related to performance in math. However, the level of educational aspirations is related to performance in math and the level of occupational aspirations is related to performance in reading and science.

The second part of the hypothesis supposes that the relationship between performances and aspirations is not the same for girls and boys. It seems that it is true only for performance in reading, both for occupational and educational aspirations. Moreover, the literature predicts that aspirations of girls are less aligned on performance but here the results show the opposite for occupational aspirations. Indeed, performance in reading are more aligned on aspirations for girls and other performances are not aligned on performances, but it is not the case for boys

neither. However, for educational aspirations, it seems that boys are more likely to aspire to master when their score increases than girls.

4 CHAPTER 4: DISCUSSION

The starting point of this thesis was to look at educational aspirations and occupational aspirations, because they matter for the gender wage gap, among other motivations. Moreover, I had reasons to think that aspirations are not aligned on performances. Particularly, for the same level of performance, girls seem to have lower aspirations. The unalignment and the gender differences could imply a loss for the economy as some talents could be wasted. This chapter is subdivided into four sections analysing the results, the contribution of the results, the limits and extensions, and the recommendations.

4.1 RESULTS

As for Chapters 2 and 3, my analysis is divided by hypothesis and by group of determinants. The first hypothesis concerns the determinants of educational and occupational aspirations. While, the second hypothesis focusses on the alignment of performance and aspirations, and the role of gender in it. For individual determinants, the results for performances are detailed in hypothesis 2. Concerning extracurricular activities, the results from data description confirm that extracurricular activities are important for aspirations, and more precisely for occupational aspirations. It is aligned with the literature mentioning the role in identity and consequently in aspirations (Beal & Crockett, 2010).

For socioeconomic determinant, the econometric analysis corroborates the positive role of the socioeconomic status on educational aspirations and occupational aspirations, but also on the situation in 5 years. Therefore, the results validate the consensus established in the literature on the role of the socioeconomic status (Gemici, Bednarz, Karmel, & Lim, 2014).

For parental determinants, the results of the data description and the econometric analysis are more mitigated. The parents' expectations play undeniably a role in aspirations and the results support a positive relationship between expectations and aspirations. Nevertheless, there is no significant relationship between these expectations and the situation in 5 years. It is possible to explain this result by the choice of the reference group as parents are likely to expect their children to study. Therefore, the results are relatively in line with the literature and confirm the role of expectations on aspirations (Rowan-Kenyon, Perna, & Swan, 2011). Concerning the level of education of parents, the results are not significant for occupational aspirations and situation in 5 years. More surprisingly, the level of education of parents negatively affects the level of educational aspirations of the student, which contradicts literature. The involvement of parents tends to affect positively the educational aspirations but negatively the situation in 5 years. Again, the fact that the results negate the expectations for the situation in 5 years is probably due to the way the variable is constructed (Kirk, Lewis-Moss, Nilsen, & Colvin, 2011). Both the level of occupation of parents and the difference between the occupational status of the mother and the father do not give significant results for aspirations and give strange results for the situation in 5 years. It could be because I only consider the highest level of occupation for parents and the form of the variable measuring the situation in 5 years. It contradicts literature (Burlin, 1976).

For scholar determinants, the size of the school and the information on career do not give any significant results. From the literature, the expectations are positive relationships (Draelants,

2013). It may be due to the proxy I used for the size of the school of the variables I generated for the information on the career. The results for the type of education are aligned with the literature except for the third dependent variables, probably for the reason already evoked (Dupriez, Monseur, & Van Campenhoudt, 2012). The quality of the teacher seems to play no role in educational aspirations but well on the situation in 5 years. The results on the encouragement of the teacher are very mitigated. The impact is negative on educational aspirations, null on occupational aspirations and positive on the situation in 5 years. These results are probably related to the proxy I used to measure the quality of the teacher. The literature predicts a positive relationship for both determinants (Murdoch, et al., 2010). The results on school resources are aligned on expectations for occupational aspirations but there is no significant relationship for occupational resources and a negative relationship with the situation in 5 years (Rowan-Kenyon, Perna, & Swan, 2011). The use of ICT resources to measure school resources may explain the results. Concerning the peer effect, there are only results for occupational aspirations and they indicate that friends' plans are not important in the formation of aspiration. It contradicts expectations (Dupriez, Monseur, & Van Campenhoudt, 2012), which may be linked to the fact that we ask students to evaluate the importance of friends' plans and their impact is mostly unconscious.

For social group determinants, the results are not significant on the interaction of the language spoken at home and the migration background. The results are similar for the migration background except that I get contradictory results for occupational aspirations. It may be due to a factor highlighted in the literature indicating that the migration background has few impacts once we control for socioeconomic status (Brinbaum & Kieffer, 2007). For social determinant, the results confirm that access to university is important in the formation of aspirations. Precisely, it is the possibility of financial support that matter (Rowan-Kenyon, Perna, & Swan, 2011).

For gender-related determinants, it seems that opportunities matter and that they are more important for boys than girls in the formation of aspirations. The results on gender-typical occupation are partially satisfying as it seems that they matter more for boys in occupational aspirations and they are not affecting the situation in 5 years. The literature predicts a stronger relationship for boys (Gianettoni, Simon-Vermot, & Gauthier, 2010). Based on the literature I expect a stronger relationship between self-concept and aspirations for girls but a stronger relationship between competitiveness and aspirations for boys (Croson & Gneezy, 2009). I get contradictory or no significant results for self-concept but validating results for competitiveness. It may be explained by the proxy I used for self-concept that exclusively concerns reading. Hence, girls are better at reading. Looking at the fear of failure, I expected that it affects more girls than boys, which is confirmed for the situation in 5 years but not for educational aspirations (O'Leary, 1974). I get no significant results for the fear of failure and it may be due to the low number of observations for this variable. Finally, I can expect that the aspirations of girls are lower but most of the results indicate the opposite.

I partially confirm hypothesis 2 because performances are not systematically aligned on aspirations but the relationship between aspirations and performances is not always different between girls and boys. Moreover, it seems that the occupational aspirations of girls are more

aligned on performance than those of boys, which contradicts my intuition. However, for educational aspirations, it seems that boys are more likely to aspire to master when their score increases than girls. It is important to remember that literature established the difference in the gender gap in performances between standardized tests and classical school results. While girls perform better in class, they tend to underperform compared to boys in standardized tests (Smith, 2014). It implies that part of the absence of a relationship between performance and aspirations may be related to this difference.

4.2 CONTRIBUTION OF THE RESULTS

My results are contributing to the literature because I propose a complete econometric analysis of students' aspirations based on individual data. I confirm part of the results of the existing literature, but I also highlight some results that differ. These results bring new insights into the Belgian situation in terms of students' aspirations. I also use the PISA database to establish empirical results based on both descriptive and econometric analysis. These results are particularly relevant for any individual interested in the formation of aspirations and the impact of gender in it.

4.3 LIMITS AND EXTENSIONS

As mentioned in Chapter 1, PISA offers individual data with a large collection of background data on the respondents and their environment. Although PISA allows identifying interesting relationships and patterns between variables, PISA does not allow to establish causal relationships. Moreover, PISA databases lack uniformity overtime on some aspects which limits the study of the evolution of the relationships. Also, PISA proposes a large set of questionnaires and database, but some questionnaires are facultative which significantly limits the number of observations for some variables.

For the internal validity of my results, I do not establish any causal relationships. I used proxies for some variables, and I am not able to measure all possible factors. Nevertheless, I proposed an analysis as complete as possible for my dataset. I could use IV to establish causal relationships, but I did not find any. My results are relatively robust and reliable. For external validity, we can extend the analysis to other countries but with extreme cautious as cultural factors play a key role in aspirations. Moreover, the sample is representative of the Belgian population.

Thinking to the possible extensions, we can extend to other PISA participants and make international comparisons. It is also possible to extend the measure of performances to specific competences. There exist weights that can be used in the analysis of PISA results that I did not use as I do not consider that it would bring additional insights in the case of Belgium, but it could be interesting to check this intuition and to consider these weights in analysing other countries.

4.4 RECOMMENDATIONS

I think that the relationship existing between aspirations and actual occupations in the future justifies a greater interest in the determinants of these aspirations. Particularly, efforts on socioeconomic inequalities and gender equality should be pursued and reinforced. It is important to consider both the impact of the school and the parents in the development of the

children and the impact on future via aspirations. Lastly, we should not only focus on children but also on what they observe, in terms of opportunities and inequalities.

CONCLUSION

The aim of this thesis was to look at occupational and educational aspirations. I started by exposing the literature and the relationships between the three facets of the thesis. The first one is occupational and educational aspirations. The second one is the gender wage gap as gender segregation is due to aspirations and reinforce the gap. The last one is educational performances. I also presented my hypotheses. I used the PISA tests that offer complete databases on participants, which allowed us to study the determinants of aspirations. Then, I detailed the data I used, their meaning and their distribution. I also established some relationships between occupational aspirations and a couple of variables. The following chapter was dedicated to my econometric analysis and my results based on three dependent variables. The objective was to check my hypotheses. Finally, I develop a discussion based on the results and their contributions. I develop the limits of my research and my recommendations.

The first hypothesis states that relationships exist between aspirations and a series of variables. I can confirm the role of extracurricular activities, socioeconomic status, parental expectations, access to university, and opportunities. I can also partially confirm the importance of performances, parental level of education, parental involvement, type of education, quality of the teacher, peer effect, gender-typical occupations, self-concept, competitiveness, and fear of failure. Moreover, the impact of gender-related determinants is relatively robust to the inclusion of the other groups of factors. While the second hypothesis states that the level of aspirations is not aligned on performance to PISA tests and gender makes a difference in the relationship. The hypothesis is partially confirmed as aspirations are not aligned on performance in some cases and the impact of performance is different for boys and girls in some cases.

REFERENCES

- Aisenbrey, S., & Brückner, H. (2008, December). Occupational Aspirations and the Gender Gap in Wages. *European Sociological Review*, 24(5), pp. 633-649.
doi:<https://doi.org/10.1093/esr/jcn024>
- Aláez-Aller, R., Longás-García, J. C., & Ullibarri-Arce, M. (2011, August 24). Visualising Gender Wage Differences in the European Union. *Gender, Work & Organization*, 18(1), pp. 49-87.
doi:<https://doi.org/10.1111/j.1468-0432.2009.00469.x>
- Andres, L., Anisef, P., Krahn, H., Looker, D., & Thiessen, V. (2012, November). The Persistence of Social Structure: Cohort, Class and Gender Effects on the Occupational Aspirations and Expectations of Canadian Youth. *Journal of Youth Studies*, 2(3), pp. 261-282.
doi:<https://doi.org/10.1080/13676261.1999.10593042>
- Antonczyk, D., Fitzenberg, B., & Sommerfeld, K. (2010, October). Rising wage inequality, the decline of collective bargaining, and the gender wage gap. *Labour Economics*, 17(5), pp. 835-847.
doi:<https://doi.org/10.1016/j.labeco.2010.04.008>
- Apostol, R., & Bilden, J. (1991, December). Educational and Occupational Aspirations of Rural High School Students. *Journal of Career Development*(18(2)), pp. 153-160.
doi:<https://doi.org/10.1177/089484539101800206>
- Archer, L., DeWitt, J., & Wong, B. (2013, May). Spheres of influence: what shapes young people's aspirations at age 12/13 and what are the implications for education policy? *Journal of Education Policy*, 29(1), pp. 58-85. doi:<https://doi.org/10.1080/02680939.2013.790079>
- Barbulescu, R., & Bidwell, M. J. (2013). Do Women Choose Different Jobs From Men? Mechanisms of Application Segregation in the Market for Managerial Workers. *Organization Science*, 24(3), pp. 737-756. doi:<http://dx.doi.org/10.1287/orsc.1120.0757>
- Baron, J. D., & Cobb-Clark, D. A. (2010, May 23). Occupational Segregation and the Gender Wage Gap in Private- and Public-Sector Employment: A Distributional Analysis. *Economic Record*, 86(273), pp. 227-246. doi:<https://doi.org/10.1111/j.1475-4932.2009.00600.x>
- Baye, A., Demonty, I., Fagnant, A., Lafontaine, D., Matoul, A., & Monseur, C. (2004). *Les compétences des jeunes de 15 ans en Communauté française de Belgique en mathématiques, en lecture et en sciences*. Liège: ULg.
- Beal, S. J., & Crockett, L. J. (2010). Adolescents' occupational and educational aspirations and expectations: Links to high school activities and adult educational attainment. *Development Psychology*(46(1)), pp. 258-265. doi:<https://doi.org/10.1037/a0017416>
- Beblo, M., Beninger, D., Heinze, A., & Laisney, F. (n.d.). Measuring Selectivity-Corrected Gender Wage Gaps in the EU. *ZEW Discussion Papers*.
- Blau, F. D., & Kahn, L. M. (2017, September 3). The Gender Wage Gap: Extent, Trends, and Explanations. *Journal of Economic Literature*, 55(3), pp. 789-865. doi:[10.1257/jel.20160995](https://doi.org/10.1257/jel.20160995)
- Booth, A. L. (2009, December). Gender and competition. *Labour Economics*, 16(6), pp. 599-606.
doi:<https://doi.org/10.1016/j.labeco.2009.08.002>
- Brinbaum, Y., & Kieffer, A. (2007, October). Aspirations et parcours scolaires des jeunes issus de l'immigration : réussites et désillusions, transmission et rupture entre générations .

- Brown, S. D., & Lent, R. W. (2004). *Career Development and Counseling: Putting Theory and Research to Work*. John Wiley & Sons .
- Brozo, W. G., Sulkunen, S., Shiel, G., Garbe, C., Pandian, A., & Valtin, R. (2014, March). Reading, Gender, and Engagement. *Journal of Adolescent & Adult Literacy*, 57(7), pp. 584-593. doi:<https://doi.org/10.1002/jaal.291>
- Burbano, V., Nicolas, P., & Meier, S. (2020, March 4). Gender Differences in Preferences for Meaning at Work. *Working paper*.
- Burlin, F.-D. (1976, August). The relationship of parental education and maternal work and occupational status to occupational aspiration in adolescent females. *Journal of Vocational Behavior*, 9(1), pp. 99-104. doi:[https://doi.org/10.1016/0001-8791\(76\)90011-7](https://doi.org/10.1016/0001-8791(76)90011-7)
- Buser, T., Niederle, M., & Oosterbeek, H. (2014). Gender, competitiveness and career choices. *The Quarterly Journal of Economics*, 129(3), pp. 1409–1447.
- Carli, L. L., Alawa, L., Leen, Y., Zhao, B., & Kim, E. (2016, January 6). Stereotypes About Gender and Science: Women ≠ Scientists. *Psychology of Women Quarterly*, 40(2), pp. 244-260. doi:<https://doi.org/10.1177/0361684315622645>
- Christofides, L. N., Polycarpou, A., & Vrachimis, K. (2013, April). Gender wage gaps, ‘sticky floors’ and ‘glass ceilings’ in Europe. *Labour Economics*, 21, pp. 86-102. doi:<https://doi.org/10.1016/j.labeco.2013.01.003>
- Cobb, R. A., McIntre, W. G., & Pratt, P. A. (1989). Vocational and Educational Aspirations of High School Students: A Problem for Rural America. *Research in Rural Education*(6(2)), pp. 11-16.
- Cochran, D. B., Wang, E. W., Stevenson, S. J., Johnson, L. E., & Crews, C. (2011, September). Adolescent Occupational Aspirations: Test of Gottfredson's Theory of Circumscription and Compromise. *The Career Development Quarterly*(59(5)), pp. 412-427. doi:<https://doi.org/10.1002/j.2161-0045.2011.tb00968.x>
- Correll, S. J. (2004, February 1). Constraints into Preferences: Gender, Status, and Emerging Career Aspirations. *American Sociological Review*, 69(1), pp. 93-113. doi:<https://doi.org/10.1177/000312240406900106>
- Croson, R., & Gneezy, U. (2009). Gender Differences in Preferences. *Journal of Economic Literature*, 47(2), pp. 448-474. doi:10.1257/jel.47.2.448
- de San Roman, A. G., & de la Rica, S. (2012, February 18). Gender Gaps in PISA Test Scores: The Impact of Social Norms and the Mother's Transmission of Role Attitudes. *IZA Discussion Paper*(6338), p. 31.
- Draelants, H. (2013). The role of secondary school for students' pursuit of higher education. *L'Orientation Scolaire et Professionnelle*, 42(1). doi:<https://doi.org/10.4000/osp.4028>
- Dupont, V., & Lafontaine, D. (2017). A better understanding of the positive effect of school average attainment on the professional aspirations of young people in French-speaking Belgium. *L'orientation Scolaire et Professionnelle*, 46(4). doi:<https://doi.org/10.4000/osp.5538>
- Dupont, V., Monseur, C., Lafontaine, D., & Fragnant, A. (2012). The impact of motivation and emotions on the professional aspirations of 15-year-old youths. *Revue Française de Pédagogie*, 181, pp. 55-70. doi:<https://doi.org/10.4000/rfp.3918>

- Dupriez, V., Monseur, C., & Van Campenhoudt, M. (2012). The influence of students' sociocultural background and their school environment on their post-secondary educational aspirations: bases of an international comparison. *L'Orientation Scolaire et Professionnelle*, 41(1). doi:<https://doi.org/10.4000/osp.3658>
- Dynes, R. R., Clarke, A. C., & Dinitz, S. (1956, April). Levels of Occupational Aspiration: Some Aspects of Family Experience as a Variable. *American Sociological Review*, 21(2), pp. 212-215. doi:10.2307/2088524
- Eagly, A., & Steffen, V. (1984). Gender stereotypes stem from the distribution of women and men into social roles. *Journal of Personality and Social Psychology*, 46(4), pp. 735-754. doi:<https://doi.org/10.1037/0022-3514.46.4.735>
- Ellemers, N. (2014, October). Women at Work: How Organizational Features Impact Career Development. *Policy Insights from the Behavioral and Brain Sciences*, 1(1). doi:<https://doi.org/10.1177/2372732214549327>
- Empey, L. T. (1956, December). Social Class and Occupational Aspiration: A Comparison of Absolute and Relative Measurement. *American Sociological Review*, 21(6), pp. 703-709. doi:10.2307/2088421
- Empson-Warner, S., & Krahn, H. (1992, February). Unemployment and occupational aspirations: a panel study of high school graduates. *Canadian Review of Sociology*, 29(1), pp. 38-54. doi:<https://doi.org/10.1111/j.1755-618X.1992.tb02424.x>
- Entorf, H., & Minoiu, N. (2004). What a Difference Immigration Law Makes: Pisa Results, Migration Background and Social Mobility in Europe and Traditional Countries of Immigration. *Centre for European Economic Research Discussion Paper*, 4(17). doi:<http://dx.doi.org/10.2139/ssrn.547785>
- European Institute for Gender Equality. (2017). *Gender segregation in education, training and the labour market*. Bruxelles. Retrieved from <http://data.consilium.europa.eu/doc/document/ST-14624-2017-ADD-2/en/pdf>
- European Parliament . (2020, January 31). *Understanding the gender pay gap: definition and causes*. Retrieved from European Parliament : <https://www.europarl.europa.eu/news/en/headlines/society/20200109STO69925/understanding-the-gender-pay-gap-definition-and-causes>
- Eurostat. (2004). Gender statistics - Occupational segregation: extent, causes and consequences. *25th CEIES seminar*. Stockholm: Office for Official Publication of the European Communities. Retrieved from <https://ec.europa.eu/eurostat/documents/4187653/5759477/KS-PB-04-001-EN.PDF/fbe01aeb-c7a4-4879-985b-c7d3c433d403?version=1.0>
- Felouzis, G., & Charmillot, S. (2012). Ce que nous apprennent les enquêtes PISA. In G. Felouzis, *Les enquêtes PISA* (pp. 67-99). Paris: Presses universitaires de France .
- Fort, I., & Murariu, A. (2018). The paths between gender, barriers, social support, coping efficacy and vocational indecision. *International Journal for Educational and Vocational Guidance*(18), pp. 241-256. doi:<http://doi-org-443.webvpn.fjmu.edu.cn/10.1007/s10775-018-9359-4>
- Fottler, M. D., & Bain, T. (2017, November). Sex differences in occupational aspirations. *Academy of Management Journal*, 23(1). doi:<https://doi.org/10.5465/255501>

- Francis, B., Hutchings, M., Archer, L., & Ameling, L. (2003, December). Subject Choice and Occupational Aspirations among Pupils at Girls' Schools. *Pedagogy, Culture & Society*, 11(3), pp. 425-442. doi:<https://doi.org/10.1080/14681360300200182>
- Frome, P. M., Alfeld, C. J., Eccles, J. S., & Barber, B. L. (2007, February). Why don't they want a male-dominated job? An investigation of young women who changed their occupational aspirations. *Educational Research and Evaluation*, 12(4), pp. 359-372. doi:<https://doi.org/10.1080/13803610600765786>
- Fuchs, T., & Wobmann, L. (2008). What accounts for international differences in student performance? A re-examination using PISA data. *The Economics of Educational and Training*, pp. 209-240. doi:https://doi.org/10.1007/978-3-7908-2022-5_10
- Furlong, A., & Biggart, A. (2006, July). Framing 'Choices': a longitudinal study of occupational aspirations among 13- to 16-year-olds. *Journal of Education and Work*, 12(1), pp. 21-35. doi:<https://doi.org/10.1080/1363908990120102>
- Gannon, B., Plasman, R., Rycx, F., & Tojerow, I. (2007). Inter-Industry Wage Differentials and the Gender Wage Gap: Evidence from European Countries. *The Economic and Social Review*, 38(1), pp. 135-155.
- Ganzeboom, H. B., De Graaf, P. M., & Treiman, D. J. (1992, March). A standard international socio-economic index of occupational status. *Social Science Research*, 21(1), pp. 1-56. doi:[https://doi.org/10.1016/0049-089X\(92\)90017-B](https://doi.org/10.1016/0049-089X(92)90017-B)
- Garcia de Polavieja, J., & Lucinda Platt, J. G. (2014). Nurse or Mechanic?: The Role of Parental Socialization and Children's Personality in the Formation of Sex-Typed Occupational Aspirations. *Social Forces*, 93, pp. 31-61.
- Gemici, S., Bednarz, A., Karmel, T., & Lim, P. (2014). *The factors affecting the educational and occupational aspirations of young Australians*. Melbourne: April. Retrieved from <https://www.ncver.edu.au/research-and-statistics/publications/all-publications/the-factors-affecting-the-educational-and-occupational-aspirations-of-young-australians>
- Gianettoni, L., & Guilley, E. (2015). Sexism and the gendering of professional aspirations . In K. Faniko, F. Lorenzi-Cioldi, O. Sarrasin, & E. Mayor, *Gender and Social Hierarchies: Perspectives from social psychology*.
- Gianettoni, L., Carvalho Arruda, C., Gauthier, J.-A., Gross, D., & Joye, D. (2015, November). Aspirations professionnelles des jeunes en Suisse : rôles sexués et conciliation travail/famille. *Social Change in Switzerland*(3). doi:10.22019/SC-2015-00005
- Gianettoni, L., Simon-Vermot, P., & Gauthier, J.-A. (2010). Atypical career choices: Breaking the gender norms, and their effects on the identities of people. *Revue Française de Pédagogie*, 173, pp. 41-50. doi:<https://doi.org/10.4000/rfp.2535>
- Gottfredson, L. S., & Lapan, R. T. (1997, September). Assessing Gender-Based Circumscription of Occupational Aspirations. *Journal of Career Assessment*, 5(4), pp. 419-441. doi:<https://doi.org/10.1177/106907279700500404>
- Guiso, L., Monte, F., Sapienza, P., & Zingales, L. (2008, May 30). Culture, gender and math. *Science*, 320, pp. 1164-1165. doi:10.1126/science.1154094
- Haas, T. (1992). What CanweBecome: Educational Aspirations of Students in Rural America . *ERIC Digest*.

- Haller, A. O., Otto, L. B., Meier, R. F., & Ohlendorf, G. W. (1974, February). Level of Occupational Aspiration: An Empirical Analysis. *American Sociological Review*, 39(1), pp. 113-121. doi:10.2307/2094280
- Haller, A., & Butterworth, C. (1960, May). Peer Influences on Levels of Occupational and Educational Aspiration. *Social Forces*, 38(4), pp. 289-295. doi:10.2307/2573036
- Haller, E. J., & Virkler, S. J. (1993). Another look at rural/nonrural differences in student's educational aspirations (1993). *Journal of Research in Rural Education*(9(3)), pp. 170-178.
- Hart, C. S. (2016, July). How Do Aspirations Matter? *Journal of Human Development and Capabilities*, 17(3), pp. 324-341. doi:https://doi.org/10.1080/19452829.2016.1199540
- Hegewisch, A., & Hartmann, H. (2014). Occupational Segregation and the Gender Wage Gap: A Job Half Done. *Institute for Women's Policy Research*.
- Hegewisch, A., Liepmann, H., Hayes, J., & Hartmann, H. (2010, September). Separate and Not Equal? Gender Segregation in the Labor Market and the Gender Wage Gap. *Institute for women's policy research* .
- Hogg, M. A., Abrams, D., & Patel, Y. (1987). Ethnic identity, self-esteem, and occupational aspirations of Indian and Anglo-Saxon British adolescents. *Genetic, Social, and General Psychology Monographs*, 113(4), pp. 487-508.
- International Labour Organization . (2016). *ISCO International Standard Classification of Occupations* . Retrieved from ILO: Promoting jobs, protecting people: <https://www.ilo.org/public/english/bureau/stat/isco/isco08/>
- Jepsen, M., O'Dorchai, S., Plasman, R., & Rycx, F. (n.d.). The wage penalty induced by part-time work: the case of Belgium. *DULBEA*.
- Jodl, K. M., Michael, A., Malanchuk, O., Eccles, J. S., & Sameroff, A. (2003, March). Parents' Roles in Shaping Early Adolescents' Occupational Aspirations. *Child Development*, 72(4), pp. 1247-1266. doi:https://doi.org/10.1111/1467-8624.00345
- Joye, D., Gauthier, J.-A., Gianettoni, L., Gros, D., Guille, D., Muller, K., . . . Gross, D. (2014). *Aspirations et orientations professionnelles des filles et des garçons en fin de scolarité obligatoire: quels déterminants pour plus d'égalité?* Lausanne.
- Kahl, J. A. (1953). Educational and occupational aspirations of "common man" boys. *Harvard Educational Review*, 23, pp. 186-203.
- Kidd, M. P., & Shannon, M. (1996, January). Does the Level of Occupational Aggregation Affect Estimates of the Gender Wage Gap? *ILR Review*, 49(2), pp. 317-329. doi:https://doi.org/10.1177/001979399604900209
- Kirk, C. M., Lewis-Moss, R. K., Nilsen, C., & Colvin, D. Q. (2011, May). The role of parent expectations on adolescent educational aspirations. *Educational Studies*, 37(1), pp. 89-99. doi:https://doi.org/10.1080/03055691003728965
- Lafontaine, D. (2006). The Belgian education system after PISA: Reform approaches in the French-speaking community of Belgium. *International Perspectives on Education Policy*, pp. 93-104.
- Liben, L. S., Bigler, R. S., & Krogh, H. R. (2002, June). Language at Work: Children's Gendered Interpretations of Occupational Titles. *Child Development*, 73(3), pp. 810-828.

- Liu, O. L., Wilson, M., & Paek, I. (2008). A Multidimensional Rasch Analysis of Gender Differences in PISA Mathematics. *Journal of Applied Measurement*, 9(1), pp. 18-35.
- Marini, M. M., & Greeberger, E. (1978, May). Sex Differences in Occupational Aspirations and Expectations. *Sociology of Work and Occupations*, 5(2), pp. 147-178.
doi:<https://doi.org/10.1177/009392857852001>
- Martin, L., & Veiga, P. (2010, December). Do inequalities in parents' education play an important role in PISA students' mathematics achievement test score disparities? *Economics of Education Review*, 29(6), pp. 1016-1033. doi:<https://doi.org/10.1016/j.econedurev.2010.05.001>
- McNair, D., & Brown, D. (1983). Predicting the occupational aspirations, occupational expectations, and career maturity of Black and White male and female 10th graders. *Vocational Guidance Quarterly*, 32(1), pp. 29-36. doi:[https://doi.org/10.1002/j.2164-](https://doi.org/10.1002/j.2164-4918.1964.tb04683.x)
- Miller, I., & Haller, A. (1963). *The occupational aspiration scale: Theory, Structure and Correlates*. Michigan: Michigan State University.
- Miller, I., & Haller, A. (1964). A measure of level of occupational aspiration. *Personnel & Guidance Journal*(42(5)), pp. 448-455. doi:<https://doi.org/10.1002/j.2164-4918.1964.tb04683.x>
- Moore, T. S. (2017, November 21). Occupational Career Change and Gender Wage Inequality. *Work and Occupations*, 45(1), pp. 82-121. doi:<https://doi.org/10.1177/0730888417742691>
- Morchio, L., & Moser, C. (2019). The Gender Gap: Micro Sources and Macro Consequences . *Meeting Papers* 143.
- Murdoch, J., Groleau, A., Ménard, L., Comoe, E., Blanchard, C., Larose, S., . . . Haouili, N. (2010). *Les aspirations professionnelles: quel effet sur le choix d'un domaine d'études non traditionnelle?* . Montréal: Centre interuniversitaire de recherche sur la science et la technologie (CIRST).
- Mussida, C., & Picchio, M. (2014). The gender wage gap by education in Italy. *The Journal of Economic Inequality*, 12, pp. 117-147.
- Nollenberger, N., Rodriguez-Planas, N., & Sevilla, A. (2016). The Math Gender Gap: The Role of Culture. *American Economic Review*, 106(5), pp. 257-261. doi:10.1257/aer.p20161121
- OECD. (2019). *Gender wage gap*. Retrieved from OECD - Data: <https://data.oecd.org/earnwage/gender-wage-gap.htm>
- OECD. (2019, December). *PISA 2018 Database* . Retrieved from OECD - Better policies for better lives : <https://www.oecd.org/pisa/data/2018database/>
- OECD. (n.d.). *Gender wage gap*. Retrieved from OECD: <https://data.oecd.org/earnwage/gender-wage-gap.htm>
- O'Leary, V. E. (1974). Some attitudinal barriers to occupational aspirations in women. *Psychological Bulletin*, 81(11), pp. 809-826. doi:<https://doi.org/10.1037/h0037267>
- Otto, L. B., Haller, A. O., Meier, R. F., & Ohlendorf, G. W. (1974, August). An empirical evaluation of a scale to measure occupational aspiration level. *Journal of Vocational Behaviour*(5(1)), pp. 1-11. doi:[https://doi.org/10.1016/0001-8791\(74\)90002-5](https://doi.org/10.1016/0001-8791(74)90002-5)
- Pereyra, M. A., Kotthoff, H.-G., & Cowen, R. (2012). *PISA Under Examination*. Rotterdam: Springer Science & Business Media.

- Petersen, T., & Morgan, L. A. (1995, September). Separate and Unequal: Occupation-Establishment Sex Segregation and the Gender Wage Gap. *American Journal of Sociology*, 101(2), pp. 329-365.
- Plasman, R., & Sissoko, S. (2005, January). Comparing Apples with Oranges: Revisiting the Gender Wage Gap in an International Perspective. *IZA Discussion Paper* .
- Powers, R. S., & Wojtkiewicz, R. A. (2004, October). Occupational Aspirations, Gender, and Educational Attainment. *Sociological Spectrum*, 24(5), pp. 601-622.
doi:<https://doi.org/10.1080/02732170490448784>
- Reskin, B. F., & Bielby, D. D. (2005). A Sociological Perspective on Gender and Career Outcomes. *Journal of Economic Perspectives*, 19(1), pp. 71-86.
- Reuben, E., Wiswall, M., & Zafar, B. (2017, September). Preferences and Biases in Educational Choices and Labour Market Expectations: Shrinking the Black Box of Gender. *Economic Journal*, 127(604), pp. 2153-2186.
- Rowan-Kenyon, H. T., Perna, L. W., & Swan, A. K. (2011, June). Structuring Opportunity: The Role of School Context in Shaping High School Students' Occupational Aspirations. *The Career Development Quarterly*(59(4)), pp. 330-344. doi:<https://doi.org/10.1002/j.2161-0045.2011.tb00073.x>
- Rycx, F., & Tojerow, I. (2002). Inter-industry Wage differentials and the gender wage gap in Belgium. *ULB Institutional Repository*.
- Rycx, F., & Tojerow, I. (2004, April 1). Rent sharing and the gender wage gap in Belgium. *International Journal of Manpower*, 25(3/4), pp. 279-299.
doi:<https://doi.org/10.1108/01437720410541407>
- Sellers, N., Satcher, J., & Comas, R. (1999, April). Children's occupational aspirations: Comparisons by gender, gender role identity, and socioeconomic status. *Professional School Counseling*, pp. 314-320.
- Sewell, W. H., Haller, A. O., & Straus, M. A. (1957, February). Social Status and Educational and Occupational Aspiration. *American Sociological Review*, 22(1), pp. 67-73.
doi:10.2307/2088767
- Shu, X., & Marini, M. M. (1998, January). Gender-Related Change in Occupational Aspirations. *Sociology of Education*, 71(1), pp. 43-67. doi:10.2307/2673221
- Smith, G. (2014). Report: Differences in School Performance Between Boys, Girls. *Education News* .
- Staff, J., Harris, A., Sabates, R., & Briddell, L. (2010, December). Uncertainty in Early Occupational Aspirations: Role Exploration or Aimlessness? *Social Forces*, 89(2), pp. 659-683.
doi:<https://doi.org/10.1353/sof.2010.0088>
- STATBEL. (2020, March 6). *Gender pay gap: Belgium scores better than most other European countries* . Retrieved from Statbel: <https://statbel.fgov.be/en/themes/work-training/wages-and-labourcost/gender-pay-gap>
- STATBEL. (2020, March 25). *Les professions en Belgique* . Retrieved from STATBEL: La Belgique en chiffres : <https://statbel.fgov.be/fr/themes/emploi-formation/marche-du-travail/les-professions-en-belgique>
- Steele, C. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist*, 52(6), pp. 613–629. doi:<https://doi.org/10.1037/0003-066X.52.6.613>

- Trice, A. D., & Rush, K. (1995, October). Sex-Stereotyping in Four-Year-Olds' Occupational Aspirations. *Perceptual and Motor Skills*(81(2)), pp. 701-7012. doi:<https://doi.org/10.1177/003151259508100266>
- Vandenbergh, V. (2011, July 10). Firm-level Evidence on Gender Wage Discrimination in the Belgian Private Economy. *LABOUR*, 25(3), pp. 330-349. doi:<https://doi.org/10.1111/j.1467-9914.2011.00524.x>
- Wall, J., Covell, K., & MacIntyre, P. (1999). Implications of social supports for adolescents' education and career aspirations. *Canadian Journal of Behavioural Science / Revue canadienne des sciences du comportement*, 31(2), pp. 63-71. doi:<https://doi.org/10.1037/h0087074>
- Watson, M., McMahon, M., Foxcroft, C., & Els, C. (2010, March). Occupational Aspirations of Low Socioeconomic Black South African Children. *Journal of Career Development*, 37(4), pp. 717-734. doi:<https://doi.org/10.1177/0894845309359351>
- Watts, L. L., Frame, M. C., Moffett, R. G., Van Hein, J. L., & Hein, M. (2014, August). The relationship between gender, perceived career barriers, and occupational aspirations. *Journal of Applied Social Psychology*(45(1)), pp. 10-22. doi:<https://doi.org/10.1111/jasp.12271>
- Weichselbaumer, D., & Winter-Ebmer, R. (2005, June 22). A Meta-Analysis of the International Gender Wage Gap. *Journal of Economic Surveys*, 19(3), pp. 479-511. doi:<https://doi.org/10.1111/j.0950-0804.2005.00256.x>
- Weis, M., Heikamp, T., & Trommsdorff, G. (2013, July 17). Gender differences in school achievement: The role of self-regulation. *Frontiers in Psychology*, 4(442). doi:10.3389/fpsyg.2013.00442
- Yan Yip, D., Chiu, M. M., & Chu Ho, E. S. (2004). Hong Kong Student Achievement in OECD-PISA Study: Gender Differences in Science Content, Literacy Skills, and Test Item Formats. *International Journal of Science and Mathematics Education*, 2, pp. 91-106. doi:<https://doi.org/10.1023/B:IJMA.0000026537.85199.36>