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Gendered professions, prestigious professions: when stereotypes condition career choices¹

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Abstract

Despite social changes and the opening up of all professions to men and women, society continues to adhere to many stereotypes, and many professions are still considered to be feminine or masculine. In addition to gendered representations of occupations, there are also social representations linked to the social prestige associated with a profession. These two elements shape the study and professional choices of individuals. Based on this observation, the aim of this article is twofold: on the one hand, to study the representation of professions according to the degree of feminization and the degree of prestige; on the other hand, to measure the influence of the perceptions of professions on the individual choices of professional project. I use a questionnaire administered to secondary school pupils and students. The results obtained show a differentiated influence of stereotypes on career plans. It also appears that individuals tend to underrate the professions they consider 'feminine'.

Keywords: orientation inequalities, gendered professions, social prestige, stereotypes

JEL classification: C25, C83, D83, D91, J16

¹ This study is the result of the *IMAGE* research project conducted with the support of the University of Strasbourg and with the collaboration of the Academy of Montpellier.

Introduction

While the nineteenth century marked the development of primary education in France, that of girls was not a priority. During the 1833 Guizot survey on the state of school, the directives given to the inspectors responsible for visiting all the schools in France were explicit about the lack of consideration the monarchy had for the education of girls: 'Only boys' schools and mixed schools will be visited. Within the latter, girls will not be counted' (Instructions from the Minister of Education Guizot to the inspectors in charge of the survey on the state of the school, 1833). It was not until the Third Republic that a radical break took place. The Ferry Laws were the first laws not to distinguish between girls and boys in terms of education: 'Primary education is compulsory for children of both sexes' (Article 4 of the Ferry Law of 28 March 1882). As early as 1870, Jules Ferry stressed the need to educate all children, whatever their social class and whatever their sex, and when confronted with those who opposed him on financial grounds, he insisted on the societal aspect: 'To claim equality of education for all classes is to do only half the work, only half of what is necessary, only half of what is due; this equality I claim, I demand for both sexes... The difficulty, the obstacle here is not in the expense, it is in the morals' (Jules Ferry, Conference Populaire, 10 April 1870).

Despite the development of co-education at all levels of the education system during the twentieth century and the priority given to combating inequality, it must be said that social attitudes have changed at a much slower pace than that at which measures to promote gender equality have been introduced: 'The weight and complexity of the internal factors that influence gender relations and are likely to create, maintain or reinforce inequalities are of such magnitude that the policies conducted with tenacity for several decades are having great difficulty in moving the lines' (Leroy et al. 2013, 22). These rigidities stem from the presence of stereotypes within society and are at the root of gendered representations of training and occupations that influence individuals' training and career choices (Duru-Bellat 2004; MEN-DEPP 2022; Ramaci et al. 2017) and mean that despite the abundance of rules in favour of gender equality at school, 'co-education remains an unfinished achievement' (Leroy et al. 2013, 9). This results in a significant gender imbalance in certain training courses and also in certain sectors of the labour market: in 2019, less than 3% of midwives were male and less than 2% of construction workers were female (INSEE, employment survey).

In addition to gendered representations of occupations, there are also social representations linked to the social prestige associated with a profession. This is a criterion of socio-economic differentiation that can condition the demand for education and the choice of orientation of individuals in higher education (Ferschtman and Weiss 1993, 1998; Demeulemeester and Diebolt 2011). The studies conducted show that regardless of the country considered and the time period considered, there is an almost consistent ranking of occupations by individuals according to the social prestige attributed to each occupation (Blau and Duncan

1967; Hodge, Treiman, and Rossi 1966; Treiman 1977).

These two types of occupational representation, firstly gendered and secondly social, lead to the development by individuals of a single cognitive scheme for representing occupations (Gottfredson 2022). This cognitive map of acceptable careers will condition study choices and subsequently determine possible changes of occupation.

Drawing on the literature on socio-cognitive models of educational orientation (Stefanovic and Mosconi 2007), this article builds on previous work on the differential role of gender in study choices and on the influence of social prestige on individuals' orientation choices (Diebolt and Jaoul-Grammare 2019; Jaoul-Grammare 2019, 2020). The aim of this work is to study individuals' perceptions of various professions and to analyse how these perceptions influence their choice of orientation. Our hypothesis is that considerations vary according to the age and gender of individuals, with younger individuals assumed to be less influenced by gender or social stereotypes. To this end, we administered a questionnaire to secondary school and university students to determine their perception of some thirty occupations according to two criteria: whether they are more or less feminine and whether they have more or less prestige.

Our work is organised as follows: after defining the notion of stereotypes from the point of view of both gender and social prestige (1), we will describe Gottfredson's model and its empirical evaluations (2). Then, we will present the questionnaire and the results of the survey (3). The cross-tabulation of data on both gender and prestige allows us, on the one hand, to establish cognitive maps of occupations as defined by Gottfredson (2002) and, on the other hand, to estimate the influence of stereotypes on individuals' choices using logistic models (4).

1. Gendered professions and social prestige

Stereotype: 'a ready-made expression or opinion without any originality, a cliché' (Larousse dictionary).

Lippmann (1922) was the first to use the notion of stereotypes, which he defined as 'images in our minds ... of simplified descriptive categories by which we seek to locate others or groups of individuals'. They are most often 'shared beliefs about the personal characteristics, usually personality traits but often also behaviours, of a group of people' (Leyens et al. 1994, 24). Stereotypes are ubiquitous in everyday life and affect all people, all situations and all countries (Bordalo et al. 2016). They are so prevalent in our societies that they end up not being identified as beliefs but rather as established facts (Croizet and Leyens 2003, 120). Unlike prejudice, which is personal and normative, the essential characteristic of a stereotype is its consensual and collective dimension. It can also be seen as a kind of unconscious threat in the sense that it is not necessary to adhere to a stereotype to be influenced by it (Desert, Croizet and Leyens 2002); there is indeed a kind of internalization of stereotypes (Bonnot and Croizet

2001). Finally, the stereotype can be used as a tool of social control in the service of the dominant group allowing it to maintain an advantageous situation (Delacolette, Dardene and Dumont 2010).

1.1 Gendered representation of occupations

Gender stereotypes can be defined as 'the set of traits and characteristics that are automatically and rigidly attributed to members of the categories girls and boys' (Mosconi 2004, 166). Like traditional stereotypes, they have an asymmetrical character that serves the dominated group (women).

Through the repeated dissemination of gendered images, society as a whole participates in the transmission of these stereotypes: just go to a toy shop where the blue/pink code is omnipresent (Appendix 1), or leaf through the advertising leaflets for Father's Day or Mother's Day (Appendix 2) in which vacuum cleaners and irons compete with plasma screens and beer machines!

School also plays a role in this diffusion. Thus, according to Forquin (1996, 23), at school we learn 'those things that are acquired (knowledge, skills, representations, roles, values) without ever appearing in the official curricula'. This is the notion of a hidden curriculum: stereotypes are embedded in the knowledge transmitted and in the interpersonal processes of guidance given to pupils (Figures 1 and 2). Indeed, despite the harmonization of school curricula between girls and boys as early as 1924, it is clear that little has changed in pedagogical practices since then (Mosconi 1989) and that the school institution continues to legitimise the relationship of domination of men over women (Missoffe, 2015). In order to combat gender inequality at school, the 'ABCD de l'égalité' scheme was tested at the beginning of the 2013 school year. It aimed to 'bring about a positive change in the attitudes of teachers and pupils of both sexes, in accordance with the commitments made in the Inter-ministerial Convention for equality between girls and boys, women and men in the education system' (MEN 2013). The project was abandoned after it faced stern contestation, including the accusation that it was an attempt to promote a certain gender theory. However, in 2014, a report to the Senate emphasised that 'most professionals note a permanence in the reproduction of gender stereotypes and prejudices, both in the tools and in the teaching methods' (Courteau 2014). This report made several recommendations aimed at moving towards more equality between girls and boys in schools, including the modification of certain teaching materials.



Figure 1. Stereotypes conveyed by the French education system

Source: 'J'apprends les maths avec picbille', CP, Editions RETZ, Paris 2008



Figure 2. Stereotypes conveyed by the French education system²

Source: Exofiches.net, 2014

 $^{^{2}}$ This worksheet made available to teachers by the exofiches.net website is no longer available and has been withdrawn following a petition from many people.

Beyond the knowledge transmitted, parents and teachers also adopt a genderdifferentiated attitude, both in terms of verbal interaction and motor skills, thus shaping guidance behaviour (Bellotti 1974; Mosconi 2001; Baudelot and Establet 2007). Individuals then make their choice of studies not according to their own skills but according to those attributed to them by society (Duru-Bellat 2004; MEN 2022). They reason according to their personal aspirations (career/family life opposition), according to the social and family context (Stefanovic and Mosconi 2007), but above all according to their feelings of competence (Bandura 1982). Yet, when it comes to competence and self-confidence, stereotypes tend to accentuate gender gaps (Bordalo et al. 2019). The pressures exerted throughout schooling, in and out of school, persuade girls in particular that science subjects are a boys' affair and lead them to adopt self-censoring behaviour towards science courses (Blanchard et al. 2016). For Mosconi (2004, 165), the education system is not neutral and 'contributes, on the one hand, to a different and unequal socialization of the two sexes and on the other hand, produces in the transmission of knowledge, a socio-sexual division of knowledge'. This gendered socialization of schooling results in a well-known paradox of the French school system: throughout their school career, girls perform better than boys (MESR, 2022) but, in the end, they have the least lucrative career paths.

One consequence of this gendered approach to occupations is the imbalance observed in the labour market, where some occupations are almost exclusively female or male (Table 1).

Occupations with a high proportion of women	% of women	Occupations with few women	% of women
Home helps, housekeepers, childminders	97.7	Truck drivers	10.5
Cleaning agent	70.5	Skilled workers in the building trade	2.1
Caregivers	90.4	Skilled structural construction worker	2.1
Nurses, midwives	87.7	Technicians and maintenance supervisors	8.9
Secretaries	97.6	Skilled material handlers	15.8
Sellers	73.5	Army, police, fire brigade	14.8
Administrative staff	73.4	Building and public works supervisor	7.9
Teacher	65.7	Farmers, stockbreeders, woodcutters, foresters	27.1
Accounting clerk	84.6	Computer engineer	20.3
Corporate administrative employee	76.9		
Domestic workers	94.3		

Table 1. Occupational families with the most and least women in 2014

Source: INSEE, 2014 Employment Survey

1.2 The social representation of professions

Social representation is a 'form of knowledge socially elaborated and shared, having a practical aim and contributing to the construction of a reality common to a social group' (Jodelet 1989, 53). It is generally an image that a social group gives itself of a social object such as a social situation.

Weber (1922) was the first to mention the notion of social status, which he defined as 'the demand for social esteem in terms of positive or negative benefits'. The notion of the social prestige of a profession made its appearance in 1950, in a confidential note for UNESCO. In it, De Bruijn showed that in the Netherlands there was a discrepancy between the education given to individuals and the economic needs of society. This discrepancy arose from the fact that individuals made their choice of orientation not on the basis of the country's economic needs, but on the basis of the social prestige they associated with certain professions.

In the mid 1950s, and again ten years later, a survey was conducted in Japan on the prestige accorded to a hundred or so professions and functions. Each occupation was assigned a social value, which made it possible to rank each occupation according to the social prestige conferred on it (Nisihira 1968). The highest-ranked occupations are those requiring a high level of skill and knowledge (Table 2). This Japanese ranking is not an exception. This ranking is found in nearly eighty studies conducted in sixty different countries, where the result is an almost consistent ranking of occupations on the part of individuals, regardless of the country or time period considered (Blau and Duncan 1967; Hodge, Treiman, and Rossi 1966; Treiman 1977).

In France, INSEE attempted to develop such a classification in the 1970s, but a true classification of occupations was not published until 1998 with the work of Chambaz, Maurin, and Torrelli. They proposed a social scale of 122 occupations and showed that the evaluation of occupations by individuals and the resulting decisions in terms of educational and occupational choices depend on several objective factors such as remuneration, qualification (Duncan 1961), and the functional importance of the occupation in society (Treiman 1977). They also highlight more subjective elements such as the normative aspect (Hope 1982)³ or the individual context of evaluation (Geurts 1984).⁴ This classification of occupations stems from a strong social consensus (Chambaz et al. 1998 ; Guichard et Huteau, 2022), similar to the international SIOPS⁵ nomenclatures (Ganzeboom and Treiman 1996), in which the best-rated occupations are those combining high pay, stable situation, and autonomy. It would thus seem that individuals associate social prestige with both working and living conditions. As a result, the professions of doctor and lawyer are generally ranked high on the social scale: first and second positions on the SIOPS scale, third and fourth positions on the French scale (Table 3).

This is hardly surprising. Indeed, doctors and lawyers have always represented 'the upper stratum of the liberal professions' (Haupt 1993, 131) and have long been synonymous with success and social ascension. 'Families perceive careers for their children as lawyers, magistrates, soldiers or tax collectors but not in commerce or industry' (Chaper, Prefect of Burgundy in 1835, quoted by Haupt 1993, 132).

³ A profession is all the more appreciated if it corresponds to what is considered good in society at a given time.

⁴ A profession is well judged by an individual if the people who practise it have charisma and influence over him/her.

⁵ Standard International Occupational Prestige Scale

Despite this consistency, there are variations in the perception of individuals depending on the context in which they evolve. Indeed, the prestige accorded to a profession is dependent on the historical, economic, and institutional conditions of the country. For example, following the terrorist attacks that affected several countries, including France, in the mid 2010s, the functions of police chief, military officer, and firefighter were included in the top 20 prestigious professions (Table 2, Maastricht University ranking, 2018). Another element to be taken into account is the influence of the media, television programmes, and certain television series: in the list of the favourite professions of the French, published in 2014 (Table 2), professions such as stylist, architect, cook, and forensic technician appear in the top 20 (www.orientationeducation.com).

	Nisihira, 1968 - Japan	Chambaz et al. 1998, France	Palmarès des métiers, 2014, France	U. Maastricht, 2018
1	Prime Minister	Aircraft pilot	Photographer	Surgeon
2	Rector of the University of Tokyo	Researcher in a laboratory	Architect	Judge
3	President of the Supreme Court	Doctor	Cook	Mayor
4	President of the Chamber of Deputies	Investigating Judge	Veterinarian	Internist
5	Minister of State	Pharmacist	Doctor	Lawyer
6	Atomic physicist	Architect	Surgeon	Director
7	Physicist	Expert legal advice	Interior decorator	Notary
8	Chief Medical Officer	Automotive design engineer	Travel designer	Pilot
9	Judge	Public works engineer	Journalist	Doctor
10	Prefect	Chemical engineer	Fashion designer	University Professor
11	University Professor	IT Consulting Engineer	Florist	Radiologist
12	Director of a large company	Medical Research Laboratory Technician	Forensic Engineer	Prefect of Police
13	Economist	Metallurgical Design Engineer	Travel agent	Civil Engineer
14	Member of Parliament	Professional sportsman	Nurse	Fire Chief
15	Oncologist	Chartered accountant	Landscape gardener	Architect
16	Botanist	Physiotherapist	School teacher	Medical analyst
17	Doctor	Radio or TV host	Midwife	Dentist
18	Ophthalmologist	Company executive	Lawyer	Pharmacist
19	Commander of a large merchant ship	Print journalist	Osteopath	Veterinarian
20	Aircraft pilot	Psychologist	Webmaster	Soldier

Table 2. Ranking of occupations

2. Stereotypes and individual study behaviour

Stereotypes can be considered from three angles: economic, sociological, and sociocognitive.

The economic approach, exemplified by statistical discrimination approaches based on beliefs (Arrow 1972, 1973) or measurement errors (Phelps 1972), justifies stereotypes by rational behaviour under imperfect information. In an effort to explain the gender wage gap,

Arrow (1972, 1973) examines how stereotypes about the productivity of various groups of individuals can influence hiring decisions and pay. For Phelps (1972), these differences stem from discrimination based on productivity measures: while individual skills are observable through the diploma, productivity is based on signals that are assumed to be less accurate for women than for men, thus justifying wage differences.

The sociological approach (Schneider 2004) only concerns social groups. It defines stereotypes as incorrect and prejudicial judgments that are applied to these groups (racial or religious stereotypes, etc). For sociologists, stereotypes are inherently incorrect and often reflect the prejudices of the person who created the stereotype (Adorno et al. 2004). The groups affected by these stereotypes suffer from the dominance of the groups that initiate and perpetuate these false images (Delacolette, Dardenne and Dumont 2010).

Finally, in the social-cognitive approach that stems from social psychology (Schneider 2004), stereotypes are seen as cognitive schemas (Schneider et al. 1979). Stereotypes are then defined as mental representations of differences between various groups. They essentially concern differences that allow for high inter-group differentiation and low intra-group differentiation. For Bordalo et al. (2016), this definition is close to the heuristic approach of Kahneman and Twersky (1983) for whom an item is representative of a group if this item is observed significantly more frequently in that group.

The empirical approach adopted in this work is based on a socio-cognitive approach. In particular, we rely on Gottfredson's (1981-2002) theory, which proposes to analyse gender stereotypes in conjunction with those related to the social representation that individuals have of professions and from which their career choices stem.

2.1 Cognitive models of school guidance

In their review of the literature on socio-cognitive models of guidance, Stefanovic and Mosconi (2007) identify four main models of educational choice for girls and boys.

The first to develop such a model was Holland in 1966 with his theory of vocational choice. According to him, individuals' vocational choices can be explained in terms of six categories of vocational interest: realistic, investigative, artistic, social, entrepreneurial, and conventional. Each of these six vocational interests corresponds to different personality traits that shape individuals' choices. In order to describe the interactions between these various personality types and the environments in which they evolve, Holland has developed a hexagonal model of choice that shows an unequal distribution of the different types of interest according to gender. Thus, girls' occupational choices are more often in occupations with a social and conventional interest, whereas boys more often opt for occupations with a realistic and investigative interest. This results in less risky behaviours in girls' activities (Page et al. 2007; Halek and Eisenhauer 2001; Gabay-Egozi et al. 2014), linked to lower levels of aspiration

(Page et al. 2007). This hexagonal model is still used today by human resources departments under the name RIASEC (Figure 3): using adapted questionnaires, this model makes it possible to 'quantify' and then graphically represent individuals' interests.



Figure 3. RIASEC model (Holland, 1966)

Source: website, University of San Diego

Unlike Holland, Bem (1981) rejects the idea of a binary gender categorisation and considers that there is no correspondence between the sex determined by marital status and the degree of masculinity or femininity of an individual. For her, there are four categories of individuals: the male individual whose main characteristics are high masculinity, low femininity, and low neutrality; the female individual (low masculinity, high femininity, and low neutrality); the androgynous individual (high masculinity, high femininity and low neutrality); and the undifferentiated individual (low masculinity, low femininity and high neutrality). She considers that the most efficient individuals are the androgynous ones and deduces that the atypical choices of orientation relative to the sex of the individual do not reflect an imbalance but underline more active and more creative personalities. Thus, unlike individuals who conform to stereotypes, those who make gender non-conforming career choices are seen as more accomplished individuals. Empirical work on non-conventional study choices emphasises, however, that while the study choice may seem atypical, the individual is not (Lemarchant and Tudoux 2008). Moreover, beyond its profitable aspect for girls (Jaoul-Grammare 2019), it appears that such choices are increasingly approved of by all individuals (Bosse and Guegnard 2007).

The social learning theory (Bandura, 1977-1995: Lent et al. 1994) goes beyond Holland's view that the environment influences the individual's behaviour and considers that there is a reciprocal effect between the two. He is particularly interested in the feeling of competence and considers that a career choice behaviour is all the more effective when the individual experiences a positive feeling of self-efficacy but also when his environment reflects such a feeling. Here he is in line with the notion of the Pygmalion effect developed by Rosenthal and Jacobson (1968), according to which the expectations of teachers/adults with regard to students' behaviour could have an effect on the actual performance of that behaviour. Thus, in general, girls tend to underestimate themselves and make educational and career choices by underestimating their skills. This is especially true when they are in traditionally male-dominated environments such as science fields (Bordalo et al. 2019) or when the perceived level of competition is high (Gneezy et al. 2003; Buser et al. 2017; Cattaneo et al. 2017).

To these microeconomic factors of study choice, one can add the expectation of a certain return on the labour market (Human Capital Theory) but also macroeconomic and institutional factors (Yazilitas et al. 2013). Institutional factors refer to the education system as a whole and the influence of its functioning on individuals' study choice behaviour (Legewie and DiPrete 2014; Blanchard et al. 2016). The macro level refers mainly to societal factors and the differentiated socialisation of men and women (Baudelot and Establet 2007).

In addition to the gender dimension, Gottfredson (1981) would introduce into his model a social prestige dimension of the professions.

2.2 The cognitive map of occupations and trade-off theory

Gottfredson (1981) proposes to represent occupations according to two criteria: a degree of masculinity/femininity and level of prestige. According to this theory, all children first differentiate occupations by gender and then associate occupations with different levels of social prestige. As a result, each individual develops a unique cognitive map to represent occupations. This cognitive map will offer individuals a field of so-called acceptable careers, based on gender compatibility on the one hand and, on the other hand, on the level of social status relative to the feeling of competence experienced in attaining it. According to Gottfredson, this map is the basis for educational orientation and career changes. According to her, individuals choose the orientations and occupations that interest them according to a process of circumscription, i.e. partitioning according to this map (Gottfredson, 1996, 2002). As they grow up, individuals will gradually eliminate certain fields of study and occupations because they do not fit their cognitive schema. In kindergarten, children identify others in a simple way: by size, age, or animal vs. human character; it is at this age that they become aware that later on, they cannot become an animal or an imaginary being. Then, in primary school, the distinction will be made according to the most visible factor for them: gender. From then on, they will eliminate from the field of their possibilities professions that seem incompatible with their conception of gender. During their pre-adolescence, individuals become aware that occupations are also distinguished by the social status to which they give access. They deduce a number of qualities (abilities, efforts) that are necessary to exercise these professions and thus make further eliminations. From the age of 14–15, the social space of individuals is determined.

Empirically, however, it appears that the two dimensions – gender and prestige – do not always intervene in the same way. Children's preferences are determined essentially by the gender dimension (Stockard et Mcgee, 1990 ; Eccles, 1994 ; Trice et al. 1995 ; Gottfredson & Lapan, 1997); thereafter, the trade-off between career and social life becomes an important factor (Huteau and Marro 1986). Nevertheless, the professions of engineer and secretary remain associated with male and female images respectively (Guichard 1992; Guichard et al. 1994a; 1994b; Wach 1992). Despite this, the social space of individuals is not fixed and can evolve according to various compromises (Gottfredson 1981, 1996, 2002).

This trade-off theory complements the notion of the cognitive map of occupations by considering that individuals can modify their aspirations to make more realistic and accessible occupational choices. These modifications are experienced as compromises between what is desired and what is achievable (Figure 4). The trade-off may be anticipated when the modifications occur as a result of an awareness of an unrealistic goal, or it may be empirical when the modifications occur as a result of personal experiences. These goal changes occur differently for girls and boys. For example, when moving from a desired choice to a realistic choice, girls generally choose traditionally female occupations and boys traditionally male occupations (Armstrong and Crombie 2000). However, women appear to be more likely than men to move into occupations that are not socially associated with their gender (Gottfredson, 2002). There also appears to be a greater uncertainty about girls' career aspirations as they grow older (Gassin et al. 1993; Flouri and Buchanan 2002) and as the time for making decisions about career plans approaches (Creed and Patton 2001).

The purpose of the following section will be to examine how individuals represent their occupations and how this representation varies with age.



Figure 4. The trade-off theory (Gottfredson, 1981, 1996, 2002).

3. Questionnaire and descriptive statistics

The study is part of the IMAGE research project conducted with the support of the University of Strasbourg and the collaboration of the Academy of Montpellier. For this purpose, we surveyed middle school students using a questionnaire based on support of the ONISEP (2018) proposed in the framework of educational resources 'Parcours-Avenir'.

3.1 Questionnaire

The questionnaire consists of two parts (see Appendix 3).

In the first part, 30 occupations or groups of occupations were proposed to the individuals. They were asked to evaluate each of these 30 occupations according to the degree of femininity/masculinity and the degree of prestige they associated with them. To do this, they were asked to associate each profession with a masculine (H), feminine (F) or mixed (M) character, depending on how they viewed the profession. They were then asked to assign a score from 1 to 10 to each profession according to the degree of prestige they associated with it (1 for the least prestigious, 10 for the most prestigious). They were then asked to identify which of the 30 occupations they considered to be the most feminine, which they considered to be the most prestigious.

The second part consists of several questions concerning the personal characteristics of the individuals (age, sex, parents' occupations). Finally, two open-ended questions ask them (1) to name their 'dream job', which is not necessarily on the list proposed in the previous part, and (2) to say why this job attracts them.

The survey was conducted in 2020 with 172 individuals (102 females and 70 males) shared as: 54 students (22 males and 32 females) and 93 school children (41 males and 52 females).

3.2 The notion of gender

First, we looked at the 'gender' of each of the 30 proposed occupations. We then compared these results with those of the answers to the questions 'Which of the 30 proposed occupations is the most female? The most male?'.

While most occupations are perceived as mixed, some are perceived as strongly gendered (Figure 5).



Figure 5. Gender perception of occupations

The gender considerations associated with the occupations on the proposed list are virtually identical among students and college students. Thus, regardless of age and gender, the occupations most frequently associated with masculinity are bricklayer and bodyguard (86% and 83% for secondary school students; 92% and 93% for students). Similarly, the occupation most frequently associated with females was secretary (82% of students and 67% of secondary school pupils), in line with the results of Guichard (1992), Guichard et al. (1994a, 1994b), and Wach (1992). The same is true of mixed occupations: over 90% of the students surveyed associated artists (96%), teachers (95%), doctors and lawyers (92%) with mixed occupations; among secondary school pupils, mixed occupations are associated with lawyers (92%) top sportsmen (92%) artists (97%) and teachers (92%).

Paradoxically, when individuals were asked to name the most feminine/masculine occupation, some differences were observed according to age and gender (Figures 6 and 7).

Among the male students, the results for the boys were the same, but in smaller proportions: only 25% cited secretary but 39% cited midwife as the most feminine occupation; 43% cited bricklayer as the most masculine occupation. On the other hand, 34% of the female students ranked midwife as the most feminine occupation and 23% ranked construction worker as the most masculine occupation.

Among middle school students, while the occupation considered to be the most masculine was again bricklaying, differences were observed for the occupation considered to be the most feminine: 30% of the boys considered the most feminine occupation to be flight

attendant and 20% of the girls considered it to be the 'nursery assistant, nursery nurse and home help' group of occupations.



Figure 6. Occupations considered to be the most feminine and masculine by gender among students

Figure 7. Occupations considered the most feminine and the most masculine by gender among college students



3.3 The notion of prestige

For all 30 occupations, we first calculate the average score obtained by each occupation, then compare this result with the answer to the question: What do you think is the most prestigious occupation? Finally, we compare these results to the open-ended question: If you had the opportunity to work in your dream job, which one would you choose?

The ranking of occupations according to associated prestige is close to international standards (Figure 8).





While similar results were observed for schoolchildren and students in terms of gender, significant differences appeared when the notion of prestige was considered. Thus, among students, the profession of astronaut is ranked in first position by all individuals regardless of their gender. The ten professions with the highest scores were common to both girls and boys: surgeon, astronaut, lawyer, airline pilot, engineer, dentist/doctor/pharmacist, researcher, veterinarian, fireman and professional sportman/woman. (Figure 9)



Figure 9. Top 10 occupations among students

When asked to name the most prestigious profession among the 30 proposed, 29% of the girls and 41% of the boys cited astronauts (Figures 10a and 10b). Girls then cited surgeon (19%), physician (13%), lawyer, researcher and policeman (6%), while boys cited airline pilot (14%), researcher or surgeon (10%). These results are consistent with the open-ended question on dream jobs, where researchers and astronauts top the list of 'dream' jobs. It should be noted, however, that this result may be biased by the sample of L3, M1, and M2 students surveyed, for whom the profession of researcher may be a professional project without any prior consideration of prestige.



Figure 10a. Occupation considered most prestigious by male students



Figure 10b. Occupation considered most prestigious by female students

The similarities between girls and boys were less pronounced among schoolchildren than among students. Although all the schoolchildren gave the highest score to the profession of firefighter, of the ten professions with the highest scores, only six were common to both girls and boys: firefighter, astronaut, policeman, surgeon, artist, and doctor. The next highest scores were for lawyers, veterinarians, nurses and midwives for girls; and airline pilots, professional sportsmen and engineers for boys. However, when asked to name the profession they consider the most prestigious in the list, both girls and boys gave priority to astronauts (Figures 11a and 11b). Finally, when asked the open-ended question about their dream job, the answers were extremely varied and reflect the influence of the media and society: professional athlete, video game designer or secret agent are the jobs dreamed of by the middle boys schoolers, while the middle school girls dream of being an artist, decorator, influencer or fashion designer.



Figure 11a. Occupation considered most prestigious by boy college students



Figure 11b. Occupation considered most prestigious by girl college students

4. The influence of stereotypes on people's choices

First, we represent the cognitive maps of the occupations in order to visualize how individuals rate the occupations according to the feminine or masculine character they associate with it. Then, using a logistic regression, we estimate the probability of underestimating female professions according to individual characteristics. Finally, we analyse the influence of the perception of occupations on career plans.

4.1 Cognitive maps

The cognitive maps represented here are taken into account at the global level and not individually. The maps of all individuals are shown, followed by maps by gender. To represent the cognitive maps, a diagram is constructed for each individual, plotting the gender associated with each profession on the x-axis and the prestige score associated with each profession on the y-axis (Figures 12, 13, 14). The resulting cloud of 30 points (1 for each occupation) is used to draw up the cognitive map of occupations. Occupations at the top of the graph are perceived as the most prestigious. In terms of gender, occupations are perceived as more feminine the further to the left of the graph they are located.



Figures 12. Cognitive map of occupations (overall population)

Figure 13. Cognitive map of occupations (girls)





Figure 14. Cognitive map of occupations (boys)

Several elements emerge from these various graphs and are consistent with the results of Nils et al (2021).

First of all, it can be seen that the highly gendered occupations reflect the distribution of the working population: home help and secretary on the one hand, and lorry driver and construction workers on the other. Secondly, it can be seen that the occupations considered to be the most prestigious are mostly considered to be mixed; this underlines an increase in the gender mix in these occupations. However, among the occupations considered prestigious, those requiring scientific training (airline pilot, astronaut) are still associated with male occupations. So, despite progress in terms of gender diversity, it would seem that individuals tend to associate jobs considered to be female with less prestigious jobs.

Is this phenomenon the same according to gender? Does it vary according to the age of the individuals? Do other factors influence the rating of occupations? The estimation of the probability of underrating female occupations will help to clarify these questions.

4.2 Underestimating women's professions: a gendered phenomenon?

For each individual, we construct a variable Y: '*underestimate female professions*'. To do this, we calculate the average of the prestige scores attributed to professions considered as female *Mf* and the average of the prestige scores attributed to professions considered as male *Mh*. The variable Y is defined as follows:

If the means Mf and Mh with Mh > Mf, are significantly different Y =1

- Otherwise, Y = 0

Thus, for an individual *i*, we have:

yi = 1 if the individual i underestimates the female professions yi = 0 if the individual i does not underestimate the female professions

We are going to estimate the behaviour of individuals as '*underrating or not underrating women's occupations*' as a function of various variables. The problem is that the usual regression techniques are unsuitable because the relationship between the endogenous variable and the explanatory variables is no longer linear. This makes it impossible to conduct an analysis of variance and the results obtained are unreliable.

Indeed, (i) OLS estimators are unbiased and convergent but inefficient; (ii) residuals are not normal; (iii) normality is asymptotically applicable if the variances of the estimators were unbiased; (iv) there is a problem of heteroskedasticity. To overcome these problems, logistic regression is used (Mc Fadden 1974, 1980, 1986).

The model is based on the hypothesis that yi depends on a variable noted yi^* , called the latent variable, which is a function of the explanatory variables. It can be assimilated to the marginal propensity to underestimate female professions.

The model becomes: $\begin{cases} y_i = 0 \text{ si } y_i^* < 0\\ y_i = 1 \text{ si } y_i^* \ge 0 \end{cases}$, with $y_i^* = \sum_i a_i x_i + \varepsilon_i$ where x_i are variables

and ε_i the residual. The variable y_i^* being unobservable, we see the inadequacy of the traditional regression. To overcome this problem, we write the model in probabilistic form where F is the distribution function of the residuals:

$$P(y_{i} = 1) = P(y_{i}^{*} \ge 0) = P(X_{i}'A + \varepsilon_{i} \ge 0) = P(\varepsilon_{i} \ge -X_{i}'A) = 1 - P(\varepsilon_{i} < -X_{i}'A)$$

$$P(y_{i} = 1) = 1 - F(-X_{i}'A)$$

$$P(y_{i} = 1) = F(X_{i}'A)$$
Finally: $y_{i} =\begin{cases} 1 \text{ with the probability } p = F(X_{i}'A) \\ 0 \text{ with the probability } 1 - p = 1 - F(X_{i}'A) \end{cases}$

The estimation is done by the maximum likelihood method. By analogy with Bernoulli's law, the joint law of y_i is $[F(X'_iA)]^{y_i}[1 - F(X'_iA)]^{1-y_i}$.

The residuals are assumed to be independent and identically distributed, so yi and yi^* are also independent. The likelihood is therefore written: $\mathcal{L} = \prod_{i=1}^{N} [F(X_i'A)]^{y_i} [1 - F(X_i'A)]^{1-y_i}$

We derive the log-likelihood:

 $\log \mathcal{L} = \sum_{i=1}^{N} \{ [y_i \times \log(F(X'_iA)] + [(1-y_i) \times \log(1-F(X'_iA)] \}$

By maximizing this function, we derive the estimator $\hat{A} = \arg Max(Log \mathcal{L})$

The model estimated here is such that F is a logistic function: $F(h) = \frac{\exp(h)}{1 - \exp(h)}, \forall h \in$

 \mathbb{R} ; $F\epsilon[0; 1]$

The results are interpreted in terms of odd-ratios: the closer a ratio is to the value '1', the more identical the situation is between individuals according to the differentiation character considered.

We estimate here the probability that Y=1 as a function of various individual variables: gender, level of education (college student) and characteristics related to the mother's occupation. For this purpose, two variables related to the mother's occupation and two variables related to the father's occupation are constructed:

- *Mother occupation* = *Feminine*: binary variable indicating whether the mother's occupation was associated in the questionnaire with a female occupation; in the case where it does not appear in the list of occupations in the questionnaire, this variable takes the value 0.

- *Mother occupation* = *Prestigious*: binary variable indicating whether the mother's occupation was associated in the questionnaire with a prestige score higher than 5; in the case where it does not appear in the list of occupations in the questionnaire, this variable is equal to 0.

- *Father occupation* = *masculine*: binary variable indicating whether the father's occupation was associated in the questionnaire with a male occupation; if it does not appear in the list of occupations in the questionnaire, this variable takes the value 0.

- *Father occupation* = *prestigious*: binary variable indicating whether the father's occupation was associated in the questionnaire with a prestige score higher than 5; in the case where it does not appear in the list of occupations in the questionnaire, this variable is equal to 0.

More than 45% of individuals underestimate the occupations they associate with women's jobs. Only 28.5% of the individuals surveyed have a mother who works in an occupation they associate with a female job, and for 44.2% of them, the mother's occupation is associated with a job considered prestigious. Only 20.3% associate their father's profession with a job perceived as masculine and 40.1% associate it with a job considered prestigious (Table 6).

Variable	Modalities	Number	%
Gender	Girl	101	58,7
	Boy	71	41,3
Educational level	College student	93	54,1
	Student	79	45,9
Gender and level of education	College girl	51	29,7
	College boy	42	24,4
	Boy Student	29	16,9
	Girl Student	50	29,1
PCS-Mother Female	0	123	71,5
	1	49	28,5
PCS-Mother Prestigious	0	96	55,8
	1	76	44,2
Father occupation -masculine	0	137	79,7
	1	35	20,3
Father occupation -Prestigious	0	103	59,9
	1	69	40,1
Y = underestimate women's professions	No	94	54,7
-	Yes	78	45,3

Table 6. Descriptive Statistics

The chi-square test indicates a significant relationship between gender and underestimating female occupations (Table 7).

Table 7. Distribution of individuals by Y and gender

	-		
	Girl	Boy	Total
Do not underestimate women's professions	63	31	94
Underestimating women's professions	38	40	78
Total	101	71	172
Chi-square = 5.9]	p - value = 0.013	5

In the sample as a whole, it appears that three factors significantly influence the probability of underestimating female occupations: gender, level of education and the father's occupation. Thus, boys on the one hand and older individuals on the other (students vs. college students) are more likely to underestimate female occupations; this is consistent with the results of Vilhjálmsdóttir and Arnkelsson (2007). The same is true for individuals who associate their father's profession with a male occupation. Conversely, individuals who perceive their father's occupation as prestigious are less likely to underestimate female occupations. Estimates by gender and by level of education show that the gender associated with the father's profession is significant for girls but not for boys, while the prestige associated with the father's profession is significant for boys but not for girls. On the other hand, these two elements seem to be essential for college students, as well as gender (boys are more likely to underrate female professions), whereas for students, none of the variables is significant (Table 8).

When we cross-reference gender and age (Table 9), we find that both male and female students are more likely to underestimate occupations considered to be female. We also note that both gender and the degree of prestige associated with the father's occupation have an influence (positive and negative respectively) on the probability of underrating female occupations.

	U			/	
Source	Ensemble	Boys	Girls	College students	Students
Gender-Girl	Réf.	-	-	Ref.	Ref.
Gender-Boy	2,5***	-	-	6.9***	NS
Level of studies-College	Ref.	Ref.	Ref.	-	-
Level of studies-Student	1.9**	NS	4.4***	-	-
Mother occupation Female-0	Ref.	Ref.	Ref.	Ref.	Ref.
Mother occupation Female-1	NS	NS	NS	NS	NS
Mother occupation Prestigious -0	Ref.	Ref.	Ref.	Ref.	Ref.
Mother occupation Prestigious -1	NS	NS	NS	NS	NS
Father occupation Male-0	Ref.	Ref.	Ref.	Ref.	Ref.
Father occupation Male-1	2.5**	NS	2.9*	6.4**	
Father occupation Prestigious -0	Ref.	Ref.	Ref.	Ref.	Ref.
Father occupation Prestigious -1	0.5**	0.2**	NS	0.4*	
n	172	71	101	93	79
Roc	0.7	0.71	0.72	0.74	0.6

Table 8. Probability of underestimating female occupations (odds-ratio)

Note: Significance at * p < 0.1; ** p < 0.05; *** p < 0.01, NS = not significant Reading: a boy is 2.5 times more likely than a girl to underestimate female occupations

Table 9. Probabilit	v of underestimating	p female occupati	ons by age and gender
14010 7.1100401110	y or anaerestimuting	- Iomaio occupati	ond of age and genaer

Source	Odds ratio
Gender and education-College girl	Ref.
Gender and level of education-College boy	5.7***
Gender and level of education-Boy Student	4***
Gender and level of education-Girl Student	4***
Mother occupation Female-0	Ref.
Mother occupation Female-1	NS
Mother occupation Prestigious -0	Ref.
Mother occupation Prestigious -1	NS
Father occupation Male-0	Ref.
Father occupation Male-1	2.8**
Father occupation Prestigious -0	Ref.
Father occupation Prestigious -1	0.5**
n	172
Roc	0.72

Note: Significance at * p < 0.1; ** p < 0.05; *** p < 0.01, NS = not significant Reading: a male student is 5.7 times more likely than a female student to underestimate female professions

4.3 Perception of the professions and the professional project

Using a logistic regression, we estimate the influence of the perception of prestige and gender associated with the professions on individuals' career plans.

For this purpose, we construct two additional variables Z and W such that:

Z: 'the individual's professional project is a job that he or she perceives as prestigious'

W: 'the individual's career plan is to work in an occupation associated with his or her gender or considered to be mixed'.

Thus, for an individual *i*, we have:

 $\begin{cases} z_i = 1 \ if \ the \ individual \ i \ is \ planning \ to \ work \ in \ a \ profession \ that \ he/she \ perceive \ as \ prestigious \\ z_i = 0 \ sif \ the \ individual \ i \ is \ planning \ to \ work \ in \ a \ profession \ that \ he/she \ does \ not \ perceive \ as \ prestigious \end{cases}$

 $\begin{cases} w_i = 1 \ if \ the \ individual \ i \ plans \ for \ an \ occupation \ associated \ to \ his \ gender \ or \\ considered \ as \ mix \\ w_i = 0 \ if \ the \ individual \ i \ plans \ for \ an \ occupation \ associated \ with \ the \ other \ gender \end{cases}$

We estimate here the probabilities Z=1 and W=1, according to the various individual variables: gender, level of education (college student), and characteristics related to the parents' occupation. In the case where the professional project does not appear in the list of professions in the questionnaire, the individual is not taken into account. Thus, only 116 or 117 individuals are concerned (Table 10).

Variable	Modalities	Number	%
Professional project associated with a profession perceived as prestigious		8	6,8
		109	93,2
Professional project associated with his or her gender or considered as mixed		9	7,8
		107	92,2

Table 10 - Descriptive statistics for the estimation of the variables Z and W

It appears that only one element influences the fact that one's career plan is perceived as prestigious: gender (Table 11). Indeed, boys are more likely to have a career goal that they perceive as prestigious. This is probably due to the fact that in our sample, all the boys have a career plan associated with an occupation they consider prestigious (Figure 15).

When we cross reference age and gender, we see that it is essentially among the youngest that gender has a significant influence (Table 12). Similarly, only the gender has an influence on choosing a career path that is consistent with one's gender or mixed (Tables 13 and 14): boys seem to be more sensitive than girls to choosing an occupation that is consistent with their gender or mixed.

Source	Odds ratio
Gender-Girl	Ref.
Gender-Boy	16.4**
Educational level -College	Ref.
Educational level-Student	NS
Mother occupation Prestigious -0	Ref.
Mother occupation Prestigious -1	NS
Father occupation Prestigious -0	Ref.
Father occupation Prestigious -1	NS
N	117
ROC	0.9

Table 11. Probability of having a career plan that is perceived as prestigious

Note: Significance at * p < 0.1; ** p < 0.05; *** p < 0.01, NS = not significant

Figure 15. Distribution of individuals according to gender and professional project associated with a job perceived as prestigious



Table 12. Probability of having a career plan that is perceived as prestigious (cross-tabulation of gender and level of education).

Source	Odds ratio
Gender and Level Education- Girl College	Ref.
Gender and Level of education- Boy College student	12,6*
Gender and level of education-Boy Student	NS
Gender and level of education-Girl Student	NS
Mother occupation Prestigious -0	Ref.
Mother occupation Prestigious -1	NS
Father occupation Prestigious -0	Ref.
Father occupation Prestigious -1	NS
n	117
ROC	0.9

Note: Significance at * p < 0.1; ** p < 0.05; *** p < 0.01, NS = not significant

Table 13. Probability of having a career plan that is associated with one's gender or considered mixed

Source	Odds ratio
Gender-Girl	Ref.
Gender-Boy	4.3*
Educational level-College	Ref.
Educational level-Student	NS
Father occupation Masculine-0	Ref.
Father occupation Masculine-1	NS
Mother occupation Feminine-0	Ref.
Mother occupation Feminine-1	NS
Underestimating Women's Professions-0	Ref.
Underestimating Women's Professions-1	NS
n	116
ROC	0.8

Table 14. Probability of having a career plan associated with one's gender or considered mixed (gender and level of education crossed)

Source	Odds ratio
Constant	-
Gender and level of education- Girl College	Ref.
Gender and level of education- Boy College	NS
Gender and level of education-Boy Student	NS
Gender and level of education- Girl Student	NS
Father occupation Masculine -0	Ref.
Father occupation Masculine -1	NS
Mother occupation Feminine -0	Ref.
Mother occupation Feminine -1	NS
Underestimating Women's Professions-0	Ref.
Underestimating Women's Professions-1	NS
Ν	116
ROC	0.8

Conclusion

The objective of this work was to analyse the gendered and social representations of professions. To this end, we conducted a survey of students and schoolchildren in which they were asked to classify 30 professions according to the associated prestige and gender. The results of the survey allowed us to draw up a list of prestigious, female, male, and mixed occupations for both college students and students and to compare them to what was answered in the open-ended questions. The cross-tabulation of data on both gender and prestige made it possible to draw up cognitive maps of occupations as defined by Gottfredson (2002) and to

estimate the probability of underrating occupations considered to be feminine according to gender and individual characteristics.

The results show that the gendered representations of occupations are almost identical among girls and boys and vary little with age: secretary and bricklayer are the two occupations that emerge from the list of 30 as being the occupations most often associated with the female and male character respectively.

In terms of prestige, while students seem to have an opinion close to the international rankings, middle school students seem to be influenced by socio-economic reality. Astronaut obtained the highest prestige score among students of all genders; it is also, along with researcher, the profession they cite as being the one they 'dream of'. Among secondary school students of all genders, while they mention 'astronaut' and 'fireman' as the most prestigious professions, their dream profession seems to be very much influenced by society and TV (sportsman, artist, etc.).

While the cognitive maps show an increase in the mix of professions considered to be the most prestigious, our estimates show that individuals tend to underrate occupations that they consider 'feminine'. This is confirmed by estimating the probability of underrating occupations judged to be feminine as a function of individual characteristics: the propensity to underrate feminine occupations is greater among boys and then among older individuals. When the two populations – schoolchildren and students – are separated, a gender difference in behaviour can be observed among schoolchildren: boys are more inclined to underrate female occupations.

Finally, the fact of having as a career plan an occupation perceived as prestigious is more particularly influenced by gender. The same is true for the probability of having a career plan that is associated with one's gender or that is considered mixed.

Thus, when we consider the notions of gender and prestige independently, it would seem that gender stereotypes are prevalent despite age, whereas the notion of prestige varies with age. On the other hand, when these two criteria are crossed, it appears that both gender and social stereotypes are present regardless of the age of the individuals; in the end, it is only their own notion of prestige that varies, with students conforming more to international standards, whereas schoolchildren are more sensitive to the media and television.

We thus agree with the European Commission's observations that 'Stereotypes are obstacles to the realisation of individual choices, both for men and women. They contribute to the persistence of inequalities by influencing the choice of education, training or employment pathways, participation in domestic and family tasks and representation in decision-making positions.' (European Commission, 2008).

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Appendix 1. The dissemination of stereotypical images by society: the role of toys (Extracts from toy catalogues distributed by various large retailers)







Faire commess.



Appendix 2. The dissemination of stereotyped images by society: advertising leaflets (Extracts from advertising catalogues distributed by various large retailers)











Appendix 3. The dissemination of stereotypical images by society: advertising spots and campaigns



Airbnb advertising (2019)



Recruitment campaign of the Ministry of National Education (2011)

Appendix 3: Questionnaire

Anonymous experiment on personal representations of professions

Some professions or functions seem more or less feminine/masculine but also more or less prestigious. <u>These</u> assessments are personal.

1. Fill in the table below:

- <u>Letter column</u>: assign a letter M/M/F/ depending on whether you consider the function to be more male, M mixed or F more female.

- <u>Note column</u>: give a score from 1 to 10 depending on whether you consider the position to be more or less prestigious (1 for the least prestigious, 10 for the most prestigious, 5 for a moderately prestigious position).

Trades	Letter Note		Trades	Letter	Note
Nursery assistant, childcare worker, Home Help			Nurse, Midwife / Maieutician		
Farmer, Fisherman			Engineer		
Artist (cinema, song, music, humour)			Journalist		
Artisan mason			Physiotherapist		
Astronaut			School teacher		
Lawyer, Judge			Mechanic		
Butcher, Baker			Construction worker, Electrician, Plumber, Heating engineer		
Researcher			Worker in a factory		
Surgeon			Line driver		
Chef / Head Cook			Firefighter		
Hairdresser			Teacher		
Driver heavy goods vehicles			Secretary		
Dentist, Physician, Pharmacist	entist, Physician, Pharmacist Steward / Stewardess				
Bodyguard			Professional sportsman/woman		
Gendarme, Police officer, Military			Veterinarian		

2. In the table above: circle in red the job you consider the most feminine, in blue the most masculine and in black the most prestigious.

3. You are : \Box Boy \Box Girl

- 4. How old are you?

5.	If	you	had	the	opportunity	to	work	in	your	dream	job,	which	one	would	you
cho	ose	·													
6.	Wh	y?				•••••									