THE UNIVERSITY OF MELBOURNE

FACULTY OF BUSINESS & ECONOMICS

Melbourne Institute Working Paper Series

Working Paper No. 1/16

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MELBOURNE INSTITUTE®
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Why Do Boys and Girls Make Different Educational Choices? The Influence of Expected Earnings and Test Scores*

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Melbourne Institute Working Paper No. 1/16

ISSN 1328-4991 (Print)

ISSN 1447-5863 (Online)

ISBN 978-0-7340-4398-6

January 2016

* We are grateful to Michele Belot, Pierre-André Chiappori, Olivier Donni, Robert Gary-Bobo, David Ribar, Catherine Sofer, Anne Solaz, for helpful comments and suggestions, and Helen Banks, for excellent editorial assistance. We are also grateful for useful comments from participants at the congress of the AFSE 2013 in Aix-en-Provence, IWAEE 2013 in Catanzaro, ESEM 2013 in Gothenburg, Gender and Education Association 2013 in London, EPC 2014 in Budapest, EALE 2014 in Ljubljana, the conference on "The Economics of Study Choices" 2014 in Germany, and seminars or workshops of the University Paris 1, INED, the Melbourne Institute, and in Aussois (Labex OSE). Benoît Rapoport thanks the iPOPS Labex from the heSam Pres (reference ANR-10-LABX-0089) for financial support. For correspondence, email <Benoit.Rapoport@univ-paris1.fr>.

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Abstract

More often, girls choose educational pathways leading to low-paid jobs and less prestigious careers, despite having equal access to education and performing as well as boys at school. We estimate a model of educational choices, in which the anticipated cost of choosing a given stream depends on the skills in each subject and is allowed to differ between boys and girls. Using a cohort of French pupils, we show first that choices at grades 10 and 12 are driven by expected future earnings and second, that boys and girls value differently their test scores when choosing study paths. Differences appear less on major choices, but rather in the degree of selectivity. Generally, girls place less value than boys on their test scores in subjects that are relevant for the chosen field of study. In particular, girls under-estimate their skills in Sciences when choosing the most prestigious and competitive pathways.

JEL classification: I2, J16, J24

Keywords: Study choices, salary wage differentials, test scores, gender stereotypes

1. Introduction

Almost everywhere in developed countries, girls and boys have an equal access to education and seem equally free to choose their field of study. Nevertheless, educational choices are highly gendered, and partly remain a mystery for economists. According to human capital theory, pupils should make educational decisions in order to obtain the highest lifetime income. However, more often, girls choose courses leading to low-paid jobs and less prestigious careers, even though they perform as well as boys at school. Indeed, girls are more likely to choose Humanities, Language, Health majors, while Engineering and Sciences remain masculine choices. For example, in France in 2011[1], when choosing at the end of grade 10 their high school pathway, in the General stream, girls represented 45% of pupils in the course in Sciences, 79% in Humanities, and 61% in Economics and Social Sciences. In higher education, this gendered pattern appears even more pronounced, in particular in the most selective post-secondary pathways, the preparatory classes for *grandes écoles*. While girls succeed as well, and now even better than boys, they represent only 30% of pupils in the preparatory classes in Sciences that lead to the most prestigious university-level colleges in Sciences. This means that even if men and women reach similar levels of education, they still differ a lot in terms of educational pathway choice.

This paper aims to decipher the puzzle of gendered educational choices, and particularly to help understand why girls seem to make detrimental educational decisions, at least in terms of future earnings. Indeed, these gendered educational choices strongly affect future incomes, as fields of study in which boys are more present generally lead to better paid jobs. In addition, prestigious university-level colleges lead to the high-ranking jobs that are generally filled by men. For example, over the 2003-2009 period, the median wage after having attended an engineering school was 2480 euros, while it was 1480 euros after a degree in Sociology or Psychology[2]. These educational choices during adolescence seem to highly explain occupational choices (Altonji, Blom, & Meghir, 2012; Joy, 2006; Borghans & Groot, 1999). Moreover "feminine" fields of study also lead to jobs where part-time work is more common, making them more exposed to the risk of poverty, especially in the case of relationship breakdown. Beyond economic consequences, this, in turn, could have a strong impact on roles and representations of women, and on demographic characteristics of society. If one aims to reduce the wage gap and eliminate the glass ceiling, it is

[1]Source, high school and higher education streams for the year 2011: DEPP (*Direction de l'Evaluation, de la prospective et de la performance*, the department of research and studies of the French Ministry of Education).

[2]Source: INSEE (France's National Institute for Statistics and Economic Studies), pooled labor force surveys (*Enquêtes Emploi*) from 2003 to 2009.

important to understand why boys and girls make different educational choices.

Education economists examine individual educational choices as an investment that increases future earnings, subject to the opportunity cost of the time spent at school. Human capital theory (Becker, 1964; Mincer, 1974; Ben-Porath, 1967) describes educational levels as a function of expected returns, themselves functions of future wages, initial wealth, and abilities. These seminal analyzes have been enriched to include social and familial background (Bowles, Gintis, & Osborne, 2001) or uncertainty (Keane & Wolpin, 1997; Eckstein & Wolpin, 1999). But simple human capital models do not fully succeed in explaining gendered choices, since, in most developed countries, men and women obtain similar amounts of education, while the type of education differs. Other explanations include expectations of children and family responsibilities that lead women to choose jobs with a low depreciation of human capital during years away from the job (Polachek, 1981, 1984; England, 1982, 1984; Sofer, 1990) and anticipation of (intentional or not) discrimination in hiring or placement (Reskin & Roos, 1990; Reskin, 1998). In those cases, the anticipated return of schooling should differ, which could lead boys and girls to make different educational choices. Recent structural dynamic models of schooling choices suggest that expected returns are not the only driving forces (see Belzil, 2007, for a review). In particular, Arcidiacono (2004) shows that the differential monetary returns to ability do not drive the ability sorting across majors, and Beffy, Fougère, and Maurel (2012) find a very low elasticity of major choice to expected earnings in France, suggesting that non-pecuniary factors are a key determinant of schooling choices.

If future wages and working arrangements are only a part of the story, which non-pecuniary factors explain gendered educational choices? In the first place, boys and girls might have different preferences (see England & Folbre, 2005, for references) and interests, possibly socially and culturally built from childhood (Huston, 1983; Eccles & Hoffman, 1984) leading them to follow different curricula at school; for example girls might have a preference for jobs, and then for education, in the health or in the social sector. Moreover, recent evidence suggests that women are less likely to compete than men (Niederle & Vesterlund, 2007[3]) so that we expect to find fewer girls in the most competitive fields of study[4]. Also, it will be the case if some norms (internalized or not) specify the (different) fields of study that should be followed by boys and by girls respectively. Gender identity (Akerlof & Kranton, 2000) may also translates into gendered educational choices, both because of the anticipation of how one will be perceived by future colleagues (Janssen & Backes-Gellner,

[3]Most evidence is from lab experiments, but in a very recent paper, De Paola, Gioia, and Scoppa (2015) have found that females are as likely as males to take part in the competition and to perform well, from a field experiment involving Italian undergraduate students.

[4]Actually, most of those differences seem rather built than innate (Booth & Nolen, 2012)

2011), and because gender identity is directly defined during schooling (Brutsaert, 1999).

As pupils generally have only a rudimentary idea of their true skill, perceived self-efficacy and self-confidence are likely to influence educational outcomes through enhanced motivation, effort and performance (Bénabou & Tirole, 2002, Compte & Postlewaite, 2004). Experimental studies have shown that men tend to be more confident than women (Barber & Odean, 2001; Bengtsson, Persson, & Willenhag, 2005), so that girls or boys might under-evaluate or over-evaluate, compared to the other gender, their own true skills and thus perceive differently the future returns of their skills. It will also be the case if there are stereotypes in the society that make girls and boys believe that they are better or worse in a given field of study than their real skills indicate. Stereotypes are judgments about abilities or attributes of individuals based on their membership in a social group (Ruble, Cohen, & Ruble, 2001). For instance, society might perceive that on average, girls are less able than boys in Mathematics or Physics. These beliefs lead to a self-fulfilling negative stereotype, if girls invest less and actually become less talented in those fields of study (Coate & Loury, 1993). The stereotype threat has been shown to reduce the performance of individuals who belong to negatively stereotyped groups, when their group membership is emphasized (Steele & Aronson, 1995). For instance, stereotype threat has been shown to harm the academic performance of females in Mathematics (Good, Aronson, & Harder, 2008; Inzlicht & Ben-Zeev, 2000; Spencer, Steele, & Quinn, 1999) and consistent exposure to this stereotype threat can reduce the degree to which individuals value the domain in question (Aronson, Fried, & Good, 2002; Osborne, 1995; Steele, 1997). This, as a result, limits the range of courses and, later, of professions that they can practice. Therefore, the long-term effects of stereotype threat might contribute to educational and social inequality (Good, Dweck, & Rattan, 2008; Schmader, Johns, & Barquissau, 2004)[5].

In order to understand gender differences in educational choices in France, we estimate several versions of a reduced form model of educational choices at two different stages, at grade 10 and at grade 12. For this purpose, we use the French Panel of Secondary School Pupils 1995 (*Panel d'élèves du second degré, recrutement 1995-2011, DEPP*), of the French Ministry of Education. This large scale survey (17830 observations) follows a cohort of pupils from their entry in 1995 into junior high school (grade 6) until they complete higher education, and mixes administrative data (educational pathway and test scores) and several surveys collected during the period. We use a measure of expected wage in order to control for future returns of education. As our measure differs along with gender, this allows to take into account the fact that girls might anticipate future

[5]See the online study ReducingStereotypeThreat.org by Stroessner and Good, for a review about the stereotype threat.

discrimination on the labor market or at least future lower earnings compared to boys after some specific fields of study (Graham & Smith, 2005). We also introduce test scores as regressors to measure individual skills, and we allow their effects to differ between boys and girls. We do this to examine whether boys and girls "value" differently their respective scores when making their choices, as would be the case if there exists a stereotype of skills for boys and girls. If this is the case, this might explain why girls choose certain fields of study less frequently than boys, even with identical test scores.

The most closely literature in which our paper falls, corresponds to the studies of the influence of test scores on educational choices, that are relatively recent. Jonsson (1999) shows that comparative advantages create sex segregation in education in Sweden but play only a modest role. While gender inequalities are relatively small in Scandinavia, but segregation substantial, this gives very scant support for parental role-model explanation of gender segregation. Van de Werfhorst, Sullivan, and Cheung (2003) analyze the impact of family background and ability on the choice of subjects in secondary and tertiary education in Great Britain and show that both absolute and relative levels of ability are relevant for the choice of subjects at degree level, but do not explain the gender segregation across disciplines. Favara (2012) shows that gender stereotyping affects educational choices from the age of 14 and that this effect is larger for British girls than for British boys. In addition, she finds that attending a sixth-form-single-sex school leads pupils to less stereotyped educational choices[6]. Last, Bartolj and Polanec (2012) find that, among students enrolled in four-year business and economics programs in the largest Slovenian university, both genders are more responsive to measured major-specific ability in majors that are traditionally more popular among them (e.g. Business Informatics for males).

Our paper contributes to this literature, first, by gathering in a single framework, both the expected differences in future earnings of boys and girls, and the differences in the way they take into account their skills in their choices. This allows us to separate what is due to those factors and what could be due to intrinsic differences between boys and girls, in particular preferences, when making educational choices. Secondly we not only consider two educational decisions, but we also take into account the choice of high school stream when analyzing post-secondary educational choices. In addition, previous works focus on subject choices at school, or the post-secondary major. In this paper, we investigate not only choices of major, but also the type of curriculum

[6]Other studies have found similar effects. Among them, Billger (2009) shows that single-sex schools yield the least segregated college major choices in the United States, and Schneeweis and Zweimüller (2012) find that Austrian girls are less likely to choose a traditionally female dominated school type and more likely to choose a male dominated school type at the age of 14 if they were exposed to a higher share of girls in previous grades.

chosen for high school graduation (General, Technical or Vocational) and the type of higher education pathway, in terms of selectivity and possible length of studies. This allows us to analyze both gender segregation by subject/major and by type of field of study. Third, when possible, we allow for endogeneity of the test scores variables, which helps us to take into account unobserved levels of effort. Indeed, effort might influence both test scores and educational choices, leading to a bias in the estimated coefficients of the test scores. Finally, this is the first study of this type for France, a country in which equal access to education has been strongly emphasized, but in which family background is a very important determinant of education[7].

The remainder of the paper is structured as follows. Section 2 presents the French educational system. Section 3 describes the stylized version of the theoretical model of educational choices we estimate. Section 4 describes the data, the samples used and the way how the main variables are built. Section 5 presents the results for high school and post-secondary choices. Finally, Section 6 provides some robustness checks, and Section 7 concludes.

2. The French educational system

2.1. Overview

The French educational system (Figure 1) is divided into three stages: primary education; secondary education; and post-secondary education. After primary school (from age 6 to 11), pupils attend junior high school (the first part of the secondary school) for 4 years (age 11 to 15).

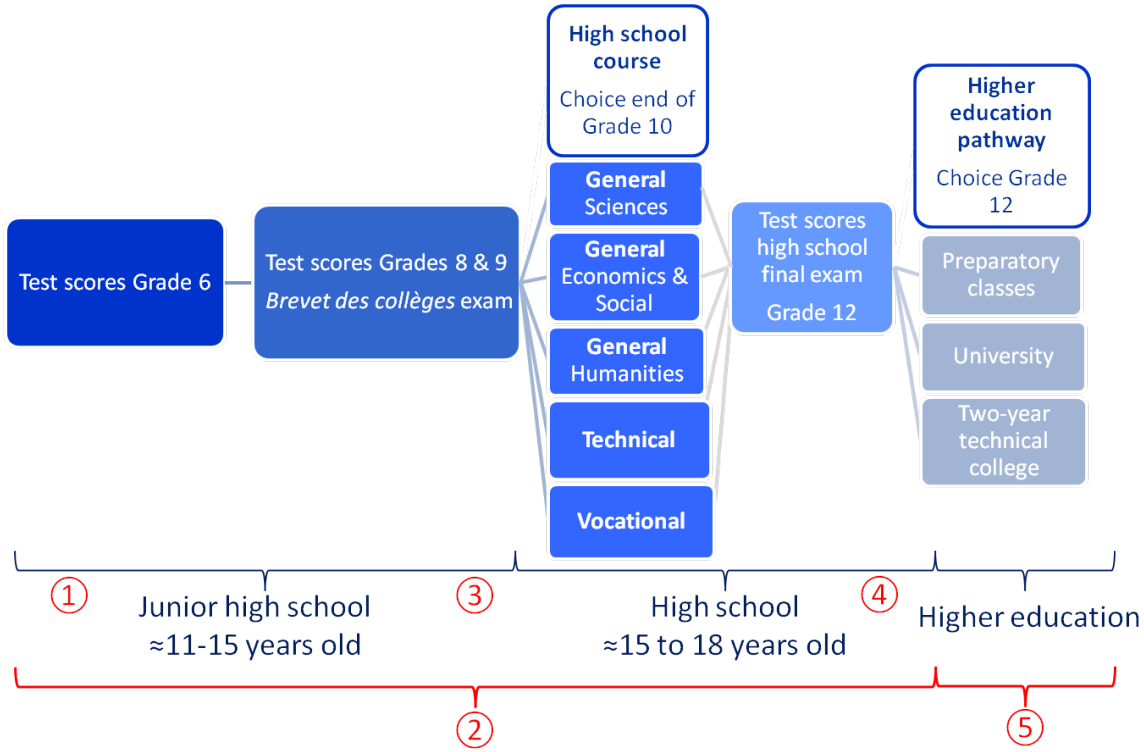
At the beginning of junior high school (*collège*), they take a national evaluation test in French and Mathematics and at the end of junior high school, they take an exam that gives them their first national diploma (*Brevet des collèges*), awarded both on the basis of the exam and of the pupil's test scores in all the classes taken during grades 8 and 9[8].

At the end of junior high school, some pupils leave the general stream to follow short vocational courses, but the majority of pupils are enrolled in high school (*lycée*, the second part of secondary school), for 3 years (age 15 to 18). At the end of the first year (age 16), pupils make their first important decision: the choice of a high school graduation course. This choice is made by the

[7]In France, more than 20% of the difference in student performance can be attributed to students' socio-economic status, which places France among the 7 countries in which students from disadvantaged families are the less likely to achieve high levels of performance (among the 64 countries who participated in PISA survey 2012). Source: *Education at a Glance 2014, OECD Indicators.*

[8]Now only the last year of junior high school (grade 9) is taken into consideration, in combination with the results of a end-of-year written national examination in French, Mathematics and History/Geography.

Figure 1: The French educational system



① to ⑤: Different surveys contained in the panel of French pupils (details in *Section 4.1.*)

pupil but has to be approved during the last staff meeting of the school year, on the basis of test scores and more or less objective assessments of the pupil's skills and his/her potential. Pupils can decide to follow a General, a Technical or a Vocational high school graduation stream. Within each study path, they choose a field of study (or course). A generalist education is provided in the General stream, in which the pupil has to choose between three main fields of study: Sciences (focused on Natural Sciences, Physical Sciences and Mathematics), Economics and Social Sciences (focused on Economics, Social Sciences and Mathematics), or Humanities (focused on French, Foreign languages, Philosophy and History-Geography). In each of these courses, the pupil has to choose some optional classes (see Table A1 for a detailed presentation of the General high school courses). The Technical stream combines a generalist education with a training covering a technology field, the main Technical courses being Industrial Science and Technology, Tertiary Science and Technology, Laboratory Science and Technology, and Medical and Social Sciences. The Vocational stream provides a more practical training leading to a profession: pupils have the choice from a large range of vocational courses depending on the area of specialization that can be grouped into two main majors, production and services. In the year 2000 at grade 11, 57% of the pupils were enrolled in a General course, 26% in a Technical course, and 17% in a Vocational course. The number of pupils following the Technical stream has been steadily increasing since

1994, this increase being mainly due to the Tertiary course and the Medical and Social course (56% of pupils in the Technical stream choose the Tertiary course)[9].

At the end of high school, around the age of 18, pupils take the second national exam in order to gain the high school diploma (*Baccalauréat*). Depending on the type of stream followed, they gain a General, a Technical or a Vocational high school diploma. The choice of study made in high school is crucial for the future, especially in the Technical and Vocational streams, where the degree of specialization is quite high, and the range of possible post-secondary studies is almost entirely determined by this choice. This is less important in the General stream, as, for example, pupils in the General Sciences course specialize in Mathematics and Physics, but they keep learning French, Foreign language and History, while pupils in the General Humanities course attend a Science class. However, the intensity and the content of the teaching differ across courses, resulting in different tests with different weightings in the exam (see Table A1)[10].

After this exam, pupils who want to keep studying have to choose between three main types of higher education: short vocational or technical colleges, university, and preparatory classes. Broadly speaking, short vocational or technical colleges (in most cases 2 years) are generally chosen by students who previously followed a Technical or a Vocational high school stream, but also by students with a General high school diploma who prefer a short training before entering into the labor market. The preparatory classes are the most selective, and prepare students for the competitive exam leading to the French elite university-level colleges (*grandes écoles*) that are the most prestigious higher education institutions. As most elite colleges are either engineering schools or business schools, in which skills in Mathematics are strongly valued, most of the students enrolled in those tracks hold a General high school diploma in Sciences, and in most other cases in Economics and Social Sciences. Finally, every student with a high school diploma has the right to enroll at any public university (in his/her geographical area) in the subject he/she wishes, whatever the high school stream previously chosen. This means that a pupil holding a high school diploma in Sciences has the right to enroll in Humanities at university – but does not mean that he/she will have the relevant knowledge. Therefore, in most cases, the chosen topic at university closely matches the high school field of study. Students can also opt for a career in Health, at different levels, by studying Medicine, Pharmacy, or Nursing, generally at university. On the whole, the system is such that almost all post-secondary pathways remain open for a pupil holding a General

[9]Source of data: DEPP French Ministry of Education.

[10]Pupils must also choose one specialty, for example in the General Sciences course, they have to choose between Mathematics, Physics or Biology, resulting in a higher weighting (and additional tests) given to the subject in the high school diploma.

high school diploma in Sciences, whereas the range of possibilities is much narrower for most of students holding a General high school diploma in Humanities.

2.2. Educational choices in France are gendered

Table 1 shows that only 21% of pupils in the General high school stream in Humanities are boys, whereas they are 55% in Sciences, and 89% in the Technical stream in the industrial sector. So right from the first important decision pupils have to make, the choices appear to be gendered. This is amplified when students make their second important choice, the type of higher education. Boys make up approximately 70% of students in the preparatory classes in Sciences or at university in Sciences, but only around 30% in Humanities. We observe the same patterns in the technical colleges between production-oriented and services-oriented courses. The percentage of boys is even lower in the Health sector, even in Medicine. Only preparatory classes for business schools (Economics) and management studies are almost balanced (boys are still less numerous).

Table 1: **Educational choices, comprehensive French national data in 2009**

High school stream	**% of boys**	**Higher education**	**% of boys**
General		**Preparatory classes**	
Sciences	55	Economics	45
Economics and Social	39	Humanities	26
Humanities	21	Sciences	70
Technical		**Two-year technical college**	
Industrial	89	Production	75
Tertiary	44	Services	36
Laboratory	44	**University**	
Medical and Social	8	Law-Politics	36
Vocational		Management	48
All courses	59	Humanities	32
		Sciences	72
		Biology	38
		Medicine	20
		Health & social	18

Source of data: DEPP French Ministry of Education

Given these statistics, we examine whether this results from differences in skills, or at least in test scores obtained during schooling. If this is not the case, we will examine several other determinants.

3. The model

We now present a stylized theoretical version of the empirical model of study choices that will be estimated in section 5, derived from human capital theory. The estimated model is about the same for the two choices (high school and post-secondary). While mainly static, the model includes some dynamic components as each choice takes into account future opportunities. Both choices are nevertheless considered separately, a more complete structural model is left for further research. We thus present a generic model for any of the two choices.

Consider, say, the first choice, that is the choice of a high school field of study, at the age of 16. When choosing a course i, the pupil k takes into account the different possible post-secondary pathways j. As we will mainly concentrate on the General courses (as explained, the Technical and Vocational courses do not offer a large range of post-secondary choices), we will assume that the pupil will keep studying after getting the high school diploma, which is indeed generally the case[11]. We assume that he/she chooses the type of course i that gives him/her the highest expected utility $EU_{i,k}$, which depends on the expected wage $Ew_{i,k}$ - specific to the course -, and on the cost of following the course $C_{i,k}$. Moreover, some individual factors might influence the expected utility and thus the choices. Pupils may have specific preferences for some fields of study. For example, boys and girls may have specific intrinsic preferences for certain subjects. In addition, social norms might state that boys and girls should, *ceteris paribus*, follow some specific fields of study. Some other factors might influence the choices, for example pupil's self-perception, parents' education or past schooling. All those factors are gathered in an individual effect $\lambda_{i,k}$.

$$EU_{i,k} = Ew_{i,k} - C_{i,k} + \lambda_{i,k} \tag{1}$$

Let $w_{j,k}$ be some measure of the wage that the pupil k may earn after a post-secondary pathway j (we assume that it does not depend on the high school diploma the pupil holds, as we do not have the relevant data, so that $w_{j,k}$ is not indexed by i). $p_{i,j}$ is the objective (observed) probability of following a post-secondary pathway j after a high school course i, summarizing the selectivity of each study path j. We define the expected wage after a high school course i as the weighted sum of expected wages after the different possible higher education pathways j.

We assume that, while making their choices, pupils hold only a very basic knowledge of what

[11] Almost all pupils holding a General high school diploma continue to study, whereas 4 pupils out of 5 continue after a Technical high school diploma. Data from 2000, DEPP French Ministry of Education.

their potential wage will be after a given course. They only have an awareness of the actual probabilities to follow the different post-secondary study paths j depending on the high school diploma i they hold, and what the current wages are after the different post-secondary study paths. They also know that wages after the different higher education pathways differ for boys and girls, as well as the probability of transition $p_{i,j}$, as it is common knowledge that women earn less on average than men, and that there are more girls in some specific fields of study and less in some others. Thus the expected wage is:

$$Ew_{i,k} = \sum_{j=1}^{J} p_{i,j}^{G} w_{j,k}^{G}, \qquad with\, G \,=\, boy,\, girl \tag{2}$$

We next define the anticipated cost $C_{i,k}$ of following a course i as a function of the abilities of the pupil. To simplify, we only distinguish the skill in Sciences a_k^S and the skill in Humanities a_k^H (including Foreign language). In this framework, we do not take into account the opportunity costs of studying longer, but a raw measure of the costs of following a given course, mainly in terms of effort, as perceived by the pupil. We believe that the opportunity costs of staying longer in education is not a major consideration at the age 16, although this assumption is probably stronger for the post-secondary choices.

However, pupils have only a rough idea about the costs. Here we assume that the pupil uses the test scores received at the different exams as a proxy for his/her own skills. One assumption we want to test is whether those test scores have the same impact on choices both for boys and girls. Impacts might differ for different reasons. For example, boys and girls might interpret differently their test scores, as a consequence of society's stereotypes of boys' and girls' average skills. In particular, boys (girls) might overestimate the marginal cost of studying Humanities (Sciences) and vice-versa. Additionally, some social norms might exist in the society that specify that with a given test score, for instance in Mathematics, girls should rather choose a given field of study and boys another field, which results in different impacts of test scores on choices for boys and girls. We thus allow for the possibility that anticipated costs are not the same for girls and boys, in the sense that they value differently their perceived abilities in Sciences and Humanities. So we define

$$C_{i,k}^{G}(a_k^S, a_k^H), \qquad with\, G \,=\, boy,\, girl \tag{3}$$

The expected utility of choosing a course i for a pupil k of gender G is thus given by:

$$EU_{i,k} = \sum_{j=1}^{n} p_{i,j}^{G} w_{j,k}^{G} - C_{i,k}^{G}(a_k^S, a_k^H) + \lambda_{i,k}, \qquad with\, G \,=\, boy,\, girl \tag{4}$$

We assume that the pupil chooses the course that gives him/her the highest utility.

4. The data

4.1. The French Panel of Secondary School Pupils

We use the French Panel of Secondary School Pupils, 1995-2011 (*Panel d'élèves du second degré*), developed by the DEPP, the department of research and studies of the French Ministry of Education. This large size panel (17 830 individuals) follows all pupils born on the 17$^{\text{th}}$ day of each month, with the exception of March, July, and October, entering into junior high school (grade 6) in September 1995, until their entry into the labor market. The sample represents about 1/40$^{\text{th}}$ of the whole cohort.

This database includes several surveys; the timing of the surveys is indicated near the bottom of Figure 1 with the symbols ① to ⑤. The first survey is the "recruitment survey ①", administered at the beginning of the first school year (1995-96), and filled in by the junior high school principals. It gathers some information about the pupil (sex, nationality, etc.), family, schooling situation (class, number of pupils in the class, etc.), school level in French and Mathematics at the beginning of junior high school, through test scores at the national evaluation at grade 6 and assessment by the school principal.

A second survey, the "tracking survey ②", collected from administrative files, provides information about the situation of the pupil each year during junior high school and high school. Consequently, for each pupil and each year, we know the attended grade (6$^{\text{th}}$ to 12$^{\text{th}}$), special classes chosen (Foreign languages, special subjects), as well as school characteristics (localization, type of school, etc.), together with test scores (averaged over grades 8 and 9) in Mathematics, French, and Foreign language, which are part of the *Brevet des collèges* national exam, and detailed test scores in each subject obtained at the national high school final examination (*Baccalauréat*).

The "family survey ③" of 1998, was completed by the parents when the pupil was in the last grade of junior high school (grade 9). Information was collected about the child and his/her family (family composition, school level of siblings, educational background of parents, parents'

involvement in schooling, etc.).

The "young people survey ④" (2002) was filled in by the pupil, who was in last year of high school (grade 12) if he/she had not repeated a grade since junior high school. This survey provides some information about higher education and professional plans, representations about past schooling, and self-assessment about three socio-emotional areas: physical self-image, capacity to build friendships, self-confidence.

Once the student had completed secondary education and begun higher education, his/her annual monitoring in post-secondary education was made through the "SUP (=higher) survey ⑤".

4.2. The samples used

As previously stated, we analyze two decisions: choices about high school courses and choices about higher education pathways.

Our high school choices analysis takes into account all the possible fields of study, that is the different courses within the General, Technical and Vocational streams. Most of socio-economic variables, and information on self-judgment are collected in the "family survey" in 1998 (86.5% of the sample), and in the "youth survey" in 2002 (78.6% of the remaining sample). We restrict our sample to pupils present in both surveys. We also consider pupils who took the *Brevet des collèges* examination, as we need the test scores, and who studied and were followed in the database at least until grade 11 (to know in which high school course they enrolled). Our sample contains 9365 individuals.

Our analysis of higher education choices focuses on pupils who followed a General high school stream, because the type of Technical or Vocational course determines almost entirely the post-secondary educational choice. We also consider students having begun a first year of higher education, who make up the vast majority of pupils holding a General high school diploma. This part of the analysis concerns 4459 individuals, among them 2449 have previously followed a high school course in Sciences, 1328 in Economics and Social Sciences, and 682 in Humanities.

4.3. The key-variables

Probabilities of transition

The probabilities of transition between each type of high school course and each post-secondary pathway (i.e. the probability of choosing a post-secondary pathway j after a high school course i),

$p_{i,j}$, come from data of the French Ministry of Education at the national level and are computed by gender, for the year 2003-2004.

The "future" wages

In order to construct a measure of expected wages, we combine two tables from the French National Institute for Statistics and Economic Studies (INSEE). The first one uses pooled labor force surveys (*Enquêtes Emploi*) from 2003 to 2009 to compute median wages of active people who have completed their initial education for 10 years or less in France, for a very detailed structure of diploma[12]. The second one gives median wages, but also the first and third quartiles, both for men and women aged between 25 and 49 years based on the 2000 labor force survey[13]. We assume that the structure of wages (both with respect to gender and between the quartiles) is the same in 2000 and for the 2003-2009 period, and we use this structure to compute the three wage quartiles for men and women for each type of diploma.

Additionally, we acknowledge that pupils may differ by their level of self-confidence, that is some of them might be optimistic and anticipate they will rather be in the top wage bracket, while others might think they will be in the bottom. Therefore, we use a measure of self-confidence collected in the survey in 2002: the degree of agreement with the statement "I usually succeed in what I start". We regress this variable on different variables (mainly answers to questions on self-image, judgments on capacities, gender, etc.), by using an ordered probit model and we use the predicted probability to weight the three levels of expected wage (first quartile, median and third quartile). Note that we do not directly use the answer to the question about self-confidence that might be correlated to the study path choices, but rather the predicted probabilities, so that the expected wage variable does not incorporate in itself the self-confidence level of each individual, avoiding potential endogeneity. Thus, the expected wage for pupil k of gender G after a given post-secondary pathway j, $w^G_{j,k}$, depends on observed distribution (Q1, Q2 and Q3) of wages after this study path for gender G and on a measure of his/her expected self-confidence.

The skills

The cost function (Equation 3) is specified as a linear function of skills a^S_k and a^H_k that are measured by the test scores earned at school. Regarding our analysis of high school choices, we use the test scores in Mathematics and Humanities (average score in French and Foreign language), at the end of junior high school (averaged over grade 8 and 9). Scores are rescaled to range between 0 and 20 (usual range in France). Our analysis focusing on higher education choices takes into

[12]Insee Première 1313 - October 2010, INSEE

[13]Enquête sur l'emploi 2000 - Résultats détaillés, Insee Résultats, 2000, INSEE

account the test scores earned at the high school examination in each subject, that we gather into an average test score in Sciences, an average test score in Humanities, and an average test score in Foreign language (details about the different subjects included in these three average test scores are in Table A1). They also range between 0 and 20. Other more flexible specifications are of course possible, but quadratic functions of scores do not seem to empirically add to the model; we thus stick to the linear one in order to reduce the number of parameters to estimate.

4.4. Descriptive statistics

Table 2 displays some descriptive statistics for the sample of grade 11 pupils, just after their first choice. The pattern of educational choices is the same as in Table 1 (exhaustive statistics in 2009). In addition, at the beginning of junior high school (grade 6), boys seem to be more successful than girls in Mathematics, but less in French. If the later remains true at the end of junior high school (grade 9), this is no longer the case for Mathematics, as boys and girls have the same test score on average at the *Brevet des collèges*. Boys are still more successful in Mathematics than in French and conversely for girls, so that a large percentage of boys have a comparative advantage in Mathematics, and girls often have a comparative advantage in French. The proportion of pupils that repeated at least a grade is higher by about 38% (7 percentage points) for boys compared with girls. Note also that, as boys are more likely than girls to leave general education at the end of junior high school, they are fewer at grade 10 and after.

Concerning the post-secondary choice, as mentionned, we restrict our study to choices after a General high school stream, as the range of possibilities is really narrow after a Technical or a Vocational stream[14]. We group the different study paths into six main categories (see Table 3): preparatory class in Sciences, other preparatory classes (in Economics or Humanities), Health (Health & Social, Medicine & Pharmacy, Biology at university), two-year technical colleges (secondary and tertiary + Sport at university), Economics, Law or Humanities at university, and finally Sciences at university.

Table 3 shows that the different selective study paths are more often chosen by boys than by girls. This is especially true for the preparatory classes in Sciences, as the propensity of this choice is about twice as high for boys than for girls (26.8% vs. 13.5% after high school diploma in Sciences). The differences are weaker for the other types of preparatory classes but are still in

[14]Moreover, most pupils go to college after a General high school diploma, which is not the case after a Technical or a Vocational diploma, which implies modeling other transitions (to the labor market or unemployment...).

Table 2: **Descriptive statistics: high school choice.** 9365 individuals

	Girls	**Boys**
Observations	5144 (54.9 %)	4221 (45.1 %)
% of girls / boys choosing		
General high school stream		
Sciences	45.6 %	54.4 %
Humanities	83.8 %	16.2 %
Economics and Social	66.9 %	33.1 %
Technical high school stream		
Industrial	6.7 %	93.3 %
Tertiary	61.7 %	38.3 %
Laboratory	60.2 %	39.8 %
Medical and Social	96.0 %	4.0 %
Vocational stream	45.6 %	54.4 %
Average test scores grade 6 (Std Dev)		
Mathematics	13.92 (2.88)	14.39 (2.86)*
French	14.97 (2.59)	14.17 (2.71)*
Average test scores - grades 8 and 9 (Std Dev)		
Mathematics	11.72 (3.11)	11.73 (2.97)
French	12.12 (2.23)	10.88 (2.26)*
Foreign Language	12.38 (2.85)	11.38 (2.81)*
Average test score	12.07 (2.44)	11.33 (2.36)*
Gap Maths-French	-0.39 (2.28)	0.85 (2.27)*
% of girls/boys having a comparative advantage in**		
Mathematics	38.0 %	62.1 %
French	51.0 %	27.9%
Mean expected wage after each course (Std Dev) (according to our calculation)		
Sciences	1816 (143)	2548 (130)*
Humanities	1616 (126)	1983 (82)*
Economics and Social	1679 (132)	2123 (90)*
Industrial	1417 (115)	1934 (111)*
Tertiary	1489 (120)	1971 (102)*
Laboratory	1676 (106)	1972 (101)*
Medical and Social	1700 (103)	1970 (83)*
Vocational	1533 (121)	1953 (102)*
Other variables		
Secondary school enrollment age (Std Dev)	11.221 (0.44)	11.229 (0.44)
Born abroad	2.7 %	2.2 %
Repeat a grade	18.7 %	25.8 %

*: means are significantly different between boys and girls, at the 5% level
**: a pupil is identified as having a comparative advantage in a subject if his/her test score in this subject is strictly higher than the other one.

favor of boys after a high school diploma in Economics (11.7% vs. 7.2%). Additionally, if boys also have a higher propensity to choose Sciences as a major at university after a high school diploma in Sciences, the gap with girls is much narrow; as a matter of fact, if we count Biology together with university in Sciences, the gap is reversed (we chose instead to count this major with Medicine and Health). Also, boys are more likely to choose a technical college than girls (36.3% vs. 19.8% after high school diploma in Sciences), apart from after a high school diploma in Humanities (the boys

Table 3: **Descriptive statistics: Higher education choices (First Year of College)**

	After a high school course in Sciences 2449 students		**After a high school course in Humanities** 682 students		**After a high school course in Economics** 1328 students	
	Girls	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**
Observations	1151 (47.0%)	1298 (53.0%)	588 (86.2%)	94 (13.8%)	928 (69.9%)	400 (30.1%)
	% of girls / boys choosing					
Preparatory class Sciences	13.5 %	26.8 %			-	-
Preparatory class Eco, Hum	5.6 %	4.0 %	10.0 %	10.4 %	7.2 %	11.7 %
Health&Social, Medicine, Bio	36.5 %	13.3 %	-	-	-	-
Technical college	19.8 %	36.3 %	16.5 %	6.4 %	26.8 %	30.4 %
University Sciences	8.9 %	12.2 %	-	-	-	-
University Eco, Law, Hum	15.7 %	7.4 %	-	-	-	-
University Eco, Law	-	-	11.8 %	18.2 %	24.9 %	31.6 %
University Humanities	-	-	-	-	31.2 %	18.3 %
Univ. Literature-Art	-	-	21.5 %	20.3 %	-	-
Univ. Languages	-	-	24.4 %	22.2 %	-	-
Univ. Human sciences	-	-	15.8 %	22.5 %	-	-
Other	-	-	-	-	9.9 %	8.0 %
Total	100 %	100 %	100 %	100 %	100 %	100 %
	Average test scores at high school diploma (Std Dev)					
Sciences	11.76 (2.72)	12.09 (2.61)*	11.35 (3.04)	11.77 (3.04)	10.61 (2.70)	10.33 (2.49)
Humanities	11.08 (2.01)	10.22 (2.09)*	10.64 (2.04)	10.55 (2.24)	10.61 (1.81)	10.24 (1.80)*
Foreign Language	11.54 (2.87)	10.60 (2.97)*	11.55 (2.59)	11.40 (2.86)	11.40 (2.61)	10.89 (2.61)*
Average test score	11.46 (2.01)	10.97 (1.99)*	11.18 (1.93)	11.24 (2.04)	10.87 (1.81)	10.49 (1.60)*
Gap Sciences-Humanities	0.67 (2.58)	1.86 (2.63)*	0.70 (2.85)	1.22 (3.21)	0.004 (2.58)	0.09 (2.68)

*: means are significantly different between boys and girls, at the 5% level

sample is however small in this group). As a consequence, girls have a higher probability to choose Medicine, Pharmacy and all the study paths in Humanities. Those differences might be partly due to the differences in test scores. In particular, boys get their high school diploma in Sciences with, on average, a higher test score in Sciences (12.09 vs. 11.76), but lower test scores in Humanities and Foreign language. The differences in test scores are much lower (and not significant except for Humanities and Foreign language for the high school diploma in Economics) for pupils who get other high school diplomas.

5. Multivariate analysis

5.1. Specification

The individual effect $\lambda_{i,k}$ in Equation 4 is specified as the sum of a linear function of control variables X_k, a gender dummy, and an error term $u_{i,k}$ that depends on the field of study. The random term $u_{i,k}$ is assumed to follow an Extreme Value distribution. Consequently, the model

is specified as a multinomial logit, as we just observe choices, and not the expected utility of the pupil which is the latent variable. $Ew_{i,k}$, the expected wage after course i, is introduced as an alternative-specific variable. With these assumptions, the models we estimate take the form:

$$EU_{i,k} = \theta \sum_{j=1}^{n} p_{i,j}^{G} w_{j,k}^{G} + \alpha_{1i} a_k^S + \alpha_{2i} a_k^H + \alpha_{3i} a_k^S \times Girl_k + \alpha_{4i} a_k^H \times Girl_k + \gamma_i Girl_k + \boldsymbol{\beta}_i \mathbf{X}_k + u_{i,k} \quad (5)$$

We use the General high school course in Sciences (first decision) then the preparatory class in Sciences (second decision) as the reference categories and the coefficient are thus interpreted in comparison with the choice of the reference.

$Girl_k$ is a dummy variable equal to 1 if the pupil k is a girl, a_k^S $[a_k^H]$ is the test score of the pupil in Mathematics [in Humanities]. $a_k^S \times Girl_k$ and $a_k^H \times Girl_k$ are the interaction variables of the test scores with the gender dummy. Finally X_k gathers the pupil's and parents' characteristics. θ indicates how pupils take into account the expected wage when making their high school decision. α_{1i} $[\alpha_{2i}]$ represents the effect, for boys, of an increase in their test score in Mathematics [Humanities] on the choice of the course i, rather than the reference. α_{3i} $[\alpha_{4i}]$ shows the difference between boys and girls in the way they use their test score in Mathematics [Humanities] to make their choice, such that $\alpha_{1i} + \alpha_{3i}$ $[\alpha_{2i} + \alpha_{4i}]$ represents the net effect of the test scores for girls. The coefficients of test scores and of the interactions between the test scores and the gender dummy, allow to test whether boys and girls use information about their skills differently when making educational choices. A boy and a girl with identical test scores (and identical other control variables) differ in expected utility by $\gamma_i + \alpha_{3i} a_k^S + \alpha_{4i} a_k^H$. γ_i captures the differences between boys and girls due to other differences than those transiting through the intensities with which they use their skills (or test scores) when making their choices (it is the difference between boys and girls when $a_k^S = a_k^H = 0$). We will label this gender effect as the "pure gender effect", perhaps somewhat imprecisely.

The empirical model estimated for higher education choices is similar, except that test scores at the high school diploma are used instead of test scores at grades 8 and 9, and the expected wage is simply the expected wage after the post-secondary pathway, without weighting by the probability of transition $p_{i,j}$ (see above).

We expect a positive impact of the wage variable on choices (pupils should prefer study paths with higher expected wages), and the probability of choosing a given field of study should increase with the test score in the most relevant subject. For example, pupils with a high test score in

Mathematics should be more likely to choose a General high school course in Sciences as the cost, in terms of effort, of following this course is reduced. Additionally, if stereotypes exist, we expect that boys will rely more heavily than girls on their test scores in Sciences whereas girls will rely more heavily than boys on their test scores in Humanities.

5.2. High school courses

Table 4 presents the results for the choice of high school course. We display only the parameters for the key variables, full results are presented in Table A2. In particular, we control for father's and mother's education, age at grade 6, a dummy for grade repeated between grade 6 and 10, self-opinion, and dummies measuring whether the father and/or mother regularly helps the child with homework, in order to take into account the fact that the gender of the helper might influence choices. The top panel displays the estimated coefficients for a first model in which we omit the expected wage variable (constrained model with $\theta = 0$) - in this case, the model is simply a multinomial logit -, while the bottom panel displays the coefficients for the unconstrained model - in this case the estimated model is an alternative-specific conditional logit model in which the alternative-specific variable is the expected wage, whereas the other variables are case-specific.

When we omit the expected wage variable (Model 1 of Table 4), we find that the gender variable has a large impact on choices. More specifically, once taken into account the fact that test scores might have a different impact across gender, girls are significantly less likely to choose science-based courses, that is the General course in Sciences (reference), and the industry-oriented Technical course (column 4), when comparing with all other courses. Additionally, slightly more often, they choose a General course in Humanities compared to Economics and Social Sciences[15]. They also choose the Technical course leading to jobs in the Medical and Social sectors significantly more often (column 7), compared to all other courses. Those results correspond to descriptive data[16]: more girls in Humanities and in the Medical and Social courses, more boys in the courses in Sciences. The picture is however very different when we add the expected wage variable (Model 2 of Table 4). First, note that this alternative-specific variable has the expected effect: pupils are more likely to choose the fields of study that offer the higher expected wages, and the effect is significant. Second, when we take into account the wage, for almost all alternatives (compared to the General course in Sciences) the gender effect becomes insignificant: the coefficient is still

[15]All our comments are based on side-by-side comparisons of coefficients, statistical tests can be obtained on demand.

[16]National data in Table 1, descriptive statistics of the sample in Table 2

Table 4: **High school choices, according to test scores at grades 8 and 9. Reference: Sciences.**

	General stream			Technical stream				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Sciences REF	**Humanities**	**Economics**	**Industrial**	**Tertiary**	**Laboratory**	**Medical Social**	**Vocational**
	Model 1: without the expected wage ($\theta = 0$)							
Girl		2.29***	1.64***	-4.11***	1.32**	1.23	4.85***	1.56**
		(0.805)	(0.517)	(1.319)	(0.600)	(1.377)	(1.466)	(0.655)
Test score Maths		-0.77***	-0.42***	-0.24***	-0.49***	-0.44***	-0.56***	-0.54***
		(0.044)	(0.030)	(0.030)	(0.034)	(0.086)	(0.146)	(0.032)
Test score Humanities		0.50***	0.12***	-0.41***	-0.18***	-0.26**	-0.13	-0.48***
		(0.063)	(0.036)	(0.035)	(0.041)	(0.112)	(0.121)	(0.040)
Test score Maths		0.01	-0.04	-0.13*	-0.16***	0.08	-0.01	-0.18***
*Girl		(0.053)	(0.040)	(0.080)	(0.046)	(0.109)	(0.152)	(0.046)
Test score Humanities		-0.05	-0.01	0.32***	0.13**	-0.10	-0.09	0.09*
*Girl		(0.074)	(0.046)	(0.113)	(0.055)	(0.135)	(0.133)	(0.056)
	Model 2: with the expected wage (no constraint on θ)							
Expected wage	0.0035**							
	(0.0015)							
Girl		1.11	0.74	-4.85***	0.50	-0.26	3.32**	0.52
		(0.954)	(0.633)	(1.362)	(0.697)	(1.510)	(1.609)	(0.792)
Test score Maths		-0.77***	-0.41***	-0.23***	-0.48***	-0.44***	-0.56***	-0.54***
		(0.044)	(0.030)	(0.030)	(0.034)	(0.086)	(0.146)	(0.032)
Test score Humanities		0.50***	0.12***	-0.41***	-0.18***	-0.26**	-0.13	-0.48***
		(0.063)	(0.036)	(0.035)	(0.042)	(0.112)	(0.121)	(0.040)
Test score Maths		0.01	-0.04	-0.13*	-0.16***	0.08	-0.01	-0.18***
*Girl		(0.053)	(0.040)	(0.079)	(0.046)	(0.109)	(0.152)	(0.046)
Test score Humanities		-0.05	-0.02	0.32***	0.13**	-0.10	-0.09	0.09*
*Girl		(0.074)	(0.046)	(0.113)	(0.055)	(0.135)	(0.133)	(0.056)

Number of observations: 9365
Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Only the coefficients of the key variables are shown, complete results are in Table A2

significant only for the industry-oriented Technical course, which is the less preferred field of study for girls (actually only a few girls have chosen this course in our sample), and for the Technical Medical and Social course, compared to the General courses in Sciences and (slightly) in Economics (but not in Humanities). Thus gender differences often found mainly stem from the omission of expected wages. Moreover, when taking this factor into account, almost all the differences between boys and girls transit through the way they use their test scores when making their decision.

Concerning the effects of test scores, we find that the chances to choose a General course in Sciences rather than any other course significantly increase with the test score in Mathematics, meaning roughly that with a good score in Mathematics, both boys and girls always prefer to choose a General course in Sciences. However, compared to this course, girls avoid more Vocational and industry- or tertiary-oriented Technical courses when their test scores in Mathematics increase,

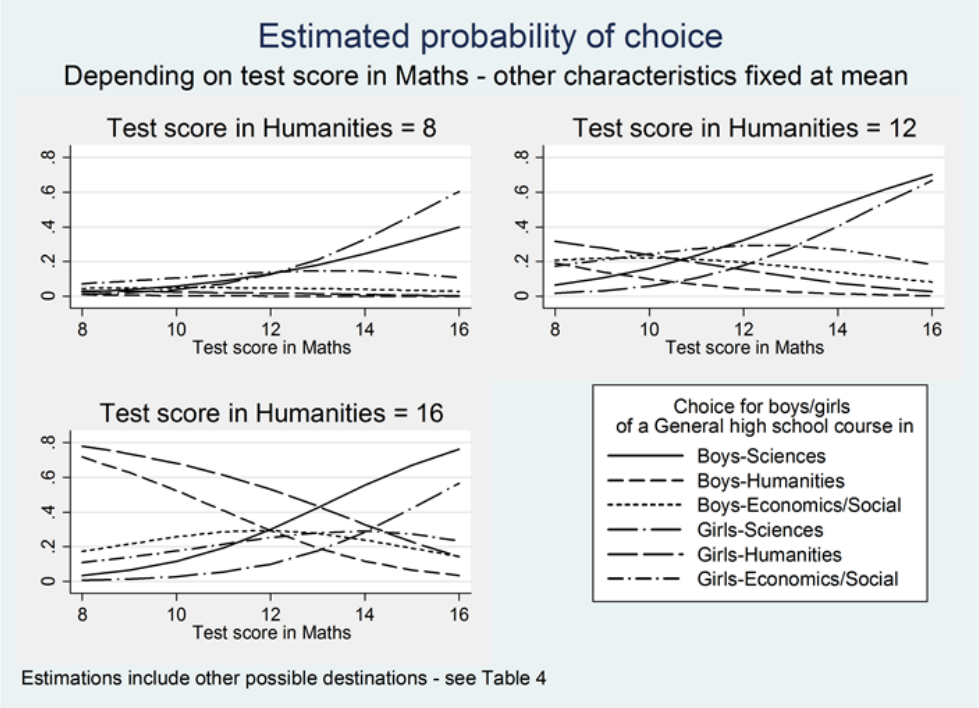
as indicated by the coefficients of the interaction term of the test score in Mathematics with gender, in columns 4, 5 and 8. Additionally, the propensity for choosing any other course rather than the General course in Humanities increases with the test score in Mathematics; but for girls this effect is lower as for Vocational and industry- or tertiary-oriented Technical courses[17]. Finally, compared to the General course in Economics and Social Sciences, a good score in Mathematics increases the chances of choosing a field of study in which Mathematics is important (General course in Sciences or industry-oriented Technical course), and decreases the propensity for choosing a General course in Humanities, a Vocational or a tertiary-oriented Technical course; the effects relative to the Technical and Vocational courses are reinforced for girls. Thus, girls seem to be much less attracted than boys to Vocational and industry- or tertiary-oriented Technical courses, with respect to their scores in Mathematics.

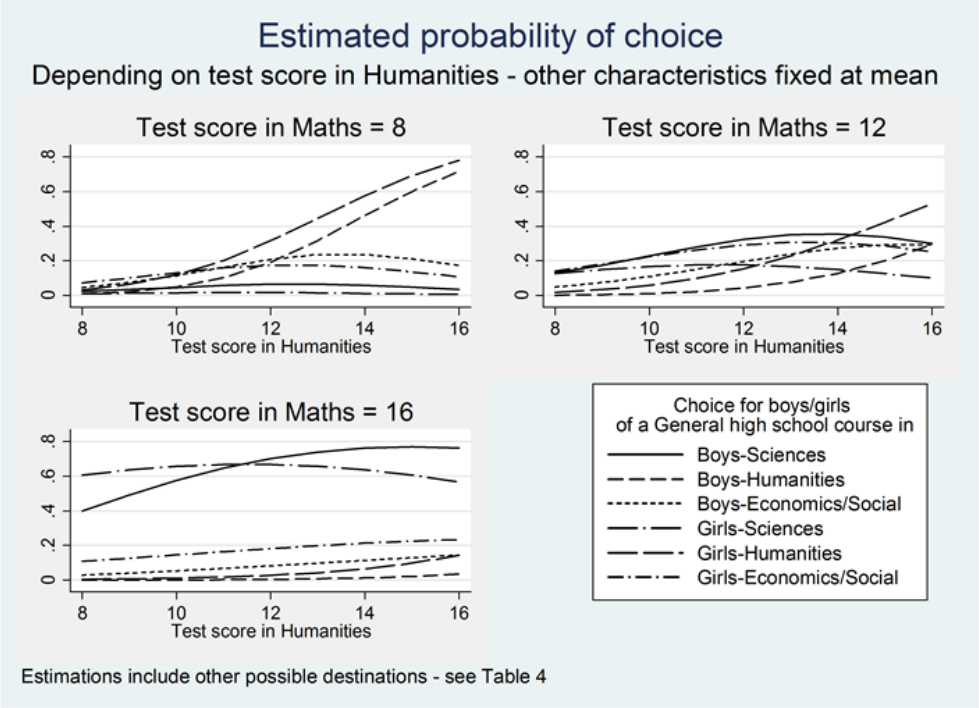
With good scores in Humanities (average score in French and Foreign language), both boys and girls prefer to choose a General course in Humanities then in Economics compared to the General course in Sciences, but always prefer a General stream to a Technical or Vocational stream. The effects are however significantly lower for girls with regard to the Vocational and industry- or tertiary-oriented Technical courses, meaning that, while girls were more reluctant to choose those courses rather than General courses with a good score in Mathematics, they appear to be less reluctant to choose them with a good score in Humanities. This means that they seem to place more value than boys on their scores in Mathematics but less on their scores in Humanities at this stage. It also means that the larger percentage of boys in the General course in Sciences is not due to the fact that boys and girls value differently the scores, but mainly that boys have higher test scores in Mathematics on average and also, higher expected wages after a General high school diploma in Sciences, compared to other courses (absolute differences and ratios are both higher for boys than for girls).

Computing marginal effects allows us to directly examine the impact of the increase in test scores on pupils' choices (Figure 2). In the case of non-linear models, it is necessary to choose at which point marginal effects are computing, generally the sample mean is chosen. This is, however, not fully relevant in our situation, as the range of choices largely depends on test scores, so that we expect marginal effects to differ along with test scores. We thus choose to directly compute predicted probabilities at different points on the continuum of test scores. More specifically, we

[17]For example the coefficient of the test score in Mathematics is -0.541-(-0.767)=0.226 when comparing Vocational (column 8) to General course in Humanities (column 3) for boys and this effect is reduced by |-0.183-(0.008)|=0.191 for girls, so that the resulting effect is only 0.035 for girls (not significant).

Figure 2: Estimated probabilities of high school course choice





choose three scores (8, 12 and 16) that roughly correspond to the first, fifth (median) and ninth deciles (weak, average and good pupils), we fix the test score of a given subject (Mathematics or Humanities) at one of these three levels, and we compute the predicted probabilities of choices at each possible test score of the other subject (other variables are fixed at the sample mean). The slope of the resulting curves gives the marginal effects of the test score for this subject at a

given test score for the other subject. To facilitate readability, figures only display a selection of courses[18]. Note that only a very few pupils have a wide gap between the two test scores, so that the corresponding areas of the figures are not very relevant (around 16 in Mathematics and 8 in Humanities and vice-versa).

Figure 2 shows that among pupils who are weak in Humanities but good in Mathematics, boys always have a higher propensity to choose a high school course in Sciences. However, the corresponding marginal effect is higher for boys until reaching a test score in Sciences around 12/13 (roughly the median); beyond that it becomes higher for girls, meaning that the gap between boys and girls reduces or even skews in favor of girls for pupils weak in Humanities. We observe the same pattern for the choice of a course in Humanities that is always more favoured by girls: the corresponding (negative) marginal effect of the test score in Mathematics is first higher for boys, and becomes higher for girls beyond the score of 12. Economics is more frequently chosen by boys with a low test score in Mathematics. This trend reverses as boys' scores increase, the crossing point increasing with the level in Humanities. When one now fixes the test score in Mathematics, one observes that the marginal effect of the test score in Humanities on the probability of choosing the General course in Sciences is almost always higher for boys than for girls. On the contrary, the marginal effect of the test score in Humanities, on the probability of choosing the General course in Humanities, is much higher for girls than for boys. This is especially striking for pupils above the median in Mathematics. Boys generally avoid Humanities, except when they are really weak in Mathematics. As a result, for pupils who are strong in both subjects, the probability of choosing the General course in Sciences is higher by around 20 percentage points for boys than for girls. Note that boys who are very good in Mathematics but weak in Humanities have a lower propensity to choose the General course in Sciences than girls, because they are more likely to choose the Technical course in Sciences. The probability of choosing a Vocational course, which is by far the most often chosen course by pupils weak both in Mathematics and Humanities, decreases at about the same pace for boys and girls (not displayed in Figure 2) both with test score in Mathematics and in Humanities.

5.3. Higher education choice

Estimations for higher education choice allow us to study two dimensions: what drives the choice between different majors, as was the case for the high school course choices, but also

[18]Other results can be obtained on demand.

between university and the most competitive pathways, the preparatory classes. Despite the large enrollment of girls in the General high school course in Sciences, and although the girls' success rate is as high as that of boys at the high school diploma in Sciences, with however slightly lower test scores in Sciences (see Table 3), only a few of them enroll in a competitive pathway, particularly a preparatory class in Sciences. Tables 5 to 7 present the effects of our key variables on the post-secondary choices, from three separate samples according with the General high school courses followed before: Sciences, Humanities, or Economics and Social Sciences. We run separate estimations mainly because test scores reveal different information on skills across the high school diploma examination, and because tests differ as well as weightings in the final average score. Additionally, the range of alternatives differ according to the high school diploma held: indeed, some post-secondary study paths are almost excluded for pupils holding a high school diploma in Humanities or in Economics. The specification includes fewer alternatives than for the high school courses, because of the smaller size of the samples (especially after the high school course in Humanities), and because of the larger set of alternatives (especially after a high school diploma in Sciences) that leads us to a more systematic grouping of the different study paths. Control variables include indicators about the educational level and socio-professional status of parents, a set of dummy variables describing the specialty chosen at the high school diploma (only for pupils who followed the high school course in Sciences), and controls for the degree of ambition of the pupil, in order to take into account some heterogeneity that might lead pupils to choose more competitive pathways (we also add an interaction term of this variable with the gender variable[19]).

5.3.1. After a high school diploma in Sciences

After a high school diploma in Sciences (Table 5), results show first that the expected wage variable still has a positive and significant impact, meaning that pupils choose study paths that lead to higher expected earnings. Additionally, the gender variable is never significant.

When considering the choices along with the degree of competitiveness of the study path, i.e. the choice between preparatory classes and university, results show that high scores in Sciences increase the chances of choosing a preparatory class in Sciences rather than a university course in Sciences for boys more than girls, whereas high scores in Humanities increase the chances of choosing a preparatory class in Humanities or in Economics rather than university (in Humanities or in Economics) for girls more than boys. This means that girls rely more on their test scores in

[19]We omit the ambition variables for the post-secondary pathway after a high school diploma in Humanities due to the low number of boys who state they are ambitious in this case.

Table 5: **Higher education choices (1st Year of College) conditional on a high school diploma in Sciences** (according with test scores at the high school diploma).

	Prepa class Sciences REF	Prepa class Eco&Hum	Health, Medicine, Biology	Technical college, Sport	University Eco, Law, Hum	University Sciences
Expected wage	0.001* (0.0006)					
Girl		1.22	1.15	-1.03	-0.08	-0.77
		(1.635)	(1.101)	(1.112)	(1.284)	(1.314)
Test score Humanities		0.30***	0.06	-0.14**	0.17**	-0.14**
		(0.084)	(0.067)	(0.055)	(0.084)	(0.064)
Test score Foreign Lang		0.20***	-0.13***	-0.10***	-0.11**	-0.09**
		(0.068)	(0.046)	(0.037)	(0.053)	(0.043)
Test score Sciences		-0.39***	-0.37***	-0.31***	-0.53***	-0.35***
		(0.069)	(0.047)	(0.041)	(0.059)	(0.052)
Test score Humanities		-0.09	-0.14	-0.02	-0.24**	-0.02
*Girl		(0.124)	(0.094)	(0.096)	(0.112)	(0.106)
Test score Foreign Lang		-0.16	0.01	-0.04	0.11	-0.04
*Girl		(0.096)	(0.064)	(0.063)	(0.074)	(0.073)
Test score Sciences		0.17*	0.12*	0.11	0.18**	0.13*
*Girl		(0.096)	(0.066)	(0.068)	(0.081)	(0.077)
Observations	2449	2449	2449	2449	2449	2449

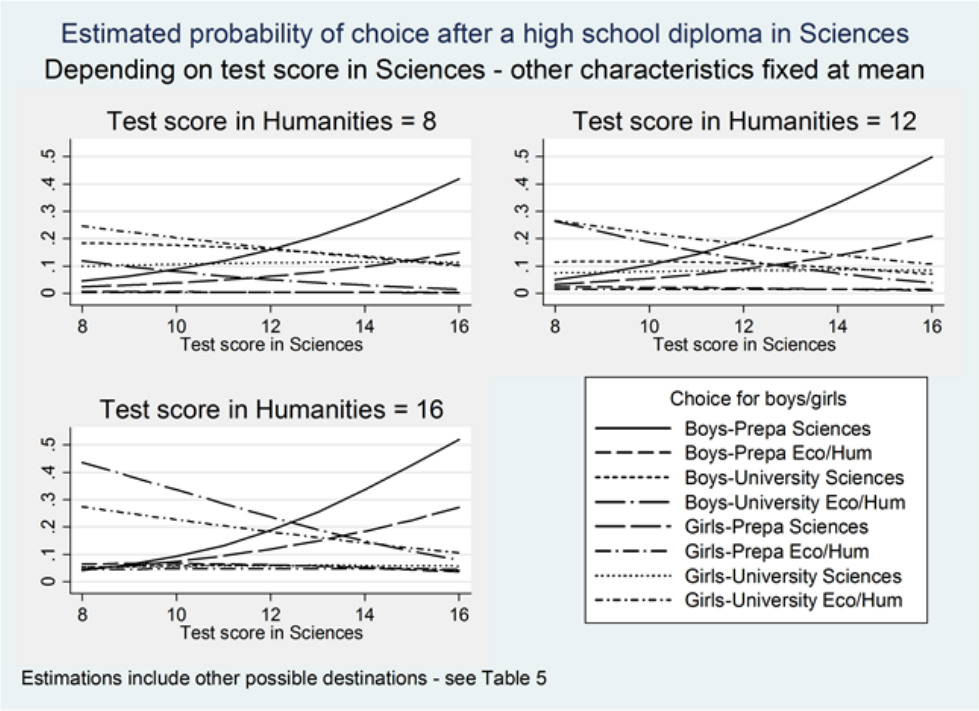
Significant at 1%: *; at 5%: **; at 10%: ***. Standard errors in parentheses.
Only the coefficients of the key variables are shown, complete results on demand.

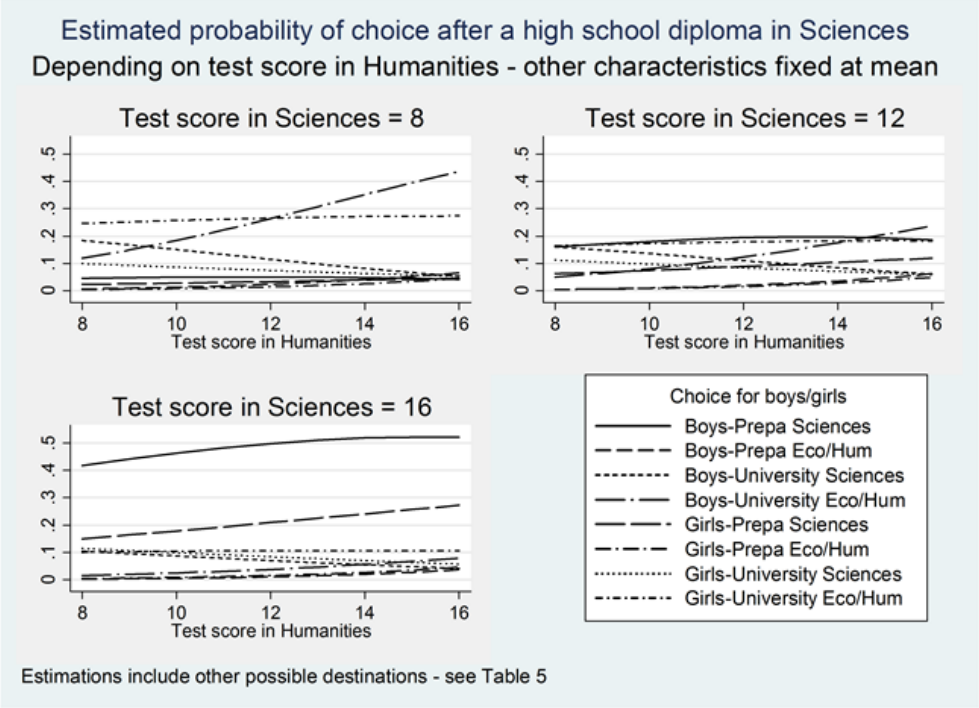
Humanities compared with boys when choosing a competitive pathway where skills in Humanities are relevant, whereas boys rely more on their test scores in Sciences when choosing a competitive pathway where skills in Sciences are relevant. If we turn now to the choice between the different subjects, results show that high scores in Sciences increase the relative probability for boys more than girls of choosing a preparatory class in Sciences rather than a preparatory class in Humanities or in Economics, and of choosing a university course in Sciences rather than in Humanities or Economics. In the same way, the chances of choosing a preparatory class in Humanities or in Economics rather than a preparatory class in Sciences, and then a university course in Humanities or in Economics rather than in Sciences, increase with the scores in Humanities slightly more for boys than for girls. Differences, although only slightly significant (in most cases at the 10% level), nevertheless suggest that boys rely more on their test scores when choosing a major for their higher education pathway, especially on the scores that are relevant (Sciences when choosing Sciences versus Humanities or Economics, and Humanities when choosing Humanities or Economics versus Sciences). In most cases, the impact of test scores for girls represent only two-thirds of the impact for boys. Finally, for technical colleges, no differences exist between boys and girls.

Figure 3 shows that the marginal effect of the test score in Sciences on the probability of

choosing a preparatory class in Sciences is always higher for boys than for girls, whatever their level in Humanities, as indicated by the slopes of the curves, while the (negative) marginal effect on the probability of choosing to go to university in Sciences is higher (in absolute value) for boys than for girls. This means that at the margin, boys, in almost every situation, will choose more often than girls a preparatory class in Sciences at the expense of university, when their level in

Figure 3: Estimated probabilities of higher education choice





Sciences increases. As a result, the gap between boys and girls increases with the test score in Sciences. More generally, Figure 3 confirms that boys use their test scores more than girls when making their post-secondary choices after a high school diploma in Sciences.

5.3.2. After a high school diploma in Economics and Social Sciences

Among students having taken Economics and Social Sciences at high school level, test scores have an impact only when choosing a preparatory class rather than another study path, as it was the case after a high school course in Sciences (Table 6). Differences between boys and girls are really marked. The chances of choosing a preparatory class rather than any other study path increase significantly with the test score in Sciences (mainly in Mathematics after a high school diploma in Economics) only for boys: there are no effects for girls. Test scores in Foreign languages have the same negative impact for boys and girls for all the study paths compared to preparatory classes. Last, test scores in Humanities have almost no impact for boys (only for technical colleges), but always have a significant negative impact for girls (at the 1 or 5%-level, with the exception of the university course in Law or Economics, for which the p-values is only 11%); even if the interaction variables have no significant impact, the size of the coefficients is

Table 6: **Higher education choices (1st Year of College) conditional on a high school diploma in Economics and Social Sciences** (according with test scores at the high school diploma).

	Prepa class REF	Other	Technical college	University Law-Eco	University Humanities
Expected wage	0.0031*** (0.0011)				
Girl		1.69	-1.37	-1.69	-1.53
		(2.360)	(2.201)	(2.132)	(2.238)
Test score Humanities		-0.03	-0.27*	-0.00	-0.07
		(0.161)	(0.143)	(0.132)	(0.144)
Test score Language		-0.25**	-0.23**	-0.21**	-0.15
		(0.117)	(0.103)	(0.105)	(0.105)
Test score Sciences		-0.34***	-0.25***	-0.23***	-0.35***
		(0.092)	(0.068)	(0.061)	(0.084)
Test score Humanities *Girl		-0.35	-0.14	-0.18	-0.18
		(0.213)	(0.189)	(0.175)	(0.186)
Test score Language *Girl		-0.07	-0.05	-0.02	-0.00
		(0.143)	(0.128)	(0.129)	(0.128)
Test score Sciences *Girl		0.30**	0.25***	0.19**	0.24**
		(0.119)	(0.094)	(0.088)	(0.104)
Observations	1328	1328	1328	1328	1328

Significant at 1%: *; at 5%: **; at 10%: ***. Standard errors in parentheses.
Only the coefficients of the key variables are shown, complete results on demand.

rather important.

5.3.3. After a high school diploma in Humanities

Once again, for pupils who have followed a high school course in Humanities (Table 7), there is a negligible impact of test scores for boys or girls when choosing between other study paths than preparatory classes, except that good scores in Humanities decrease more sharply, for both genders, the chances of choosing a technical college compared to other study paths. The effects of the interaction variables between test scores and gender are much less precisely estimated after a high school diploma in Humanities, compared to the high school courses in Sciences and Economics, both because the sample size is smaller and also probably because only a few boys choose this course. The size of the impacts is however rather important. Almost all the results go in the same direction: test scores influence post-secondary choices much less for girls than for boys, so that whereas the chances of choosing a preparatory class compared to the other study paths significantly increase for boys with test scores in Humanities and Sciences (and sometimes in Foreign languages), this is not the case for girls.

******

Table 7: **Higher education choices (1st Year of College) conditional on a high school diploma in Humanities** (according with test scores at the high school diploma).

	Prepa class REF	Technical college	University Law-Eco	University Literature-Art	University Languages	University Human Sciences
Expected wage	0.0045* (0.0023)					
Girl		-2.20	-5.44	-5.67	-1.79	-2.86
		(5.054)	(3.942)	(4.024)	(4.212)	(3.899)
Test score Humanities		-1.34***	-0.60**	-0.63**	-1.07***	-0.59**
		(0.459)	(0.243)	(0.284)	(0.346)	(0.252)
Test score Language		0.71*	0.08	0.03	0.84***	0.07
		(0.416)	(0.271)	(0.264)	(0.284)	(0.260)
Test score Sciences		-0.64**	-0.51**	-0.55**	-0.49**	-0.35
		(0.256)	(0.252)	(0.249)	(0.242)	(0.245)
Test score Humanities		0.60	0.09	0.14	0.36	0.01
*Girl		(0.479)	(0.277)	(0.305)	(0.363)	(0.279)
Test score Language		-0.78*	-0.20	-0.28	-0.75**	-0.30
*Girl		(0.429)	(0.288)	(0.280)	(0.298)	(0.277)
Test score Sciences		0.39	0.32	0.41	0.36	0.28
*Girl		(0.270)	(0.264)	(0.259)	(0.253)	(0.258)
Observations	682	682	682	682	682	682

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Only the coefficients of the key variables are shown, complete results on demand.

To summarize, test scores only have an impact on the choice between the most selective pathways (the preparatory classes) and other study paths.

- Whatever the choice and the origin (high school diploma in Economics, Humanities or Sciences), scores in Sciences have less impact for girls than for boys.
- Whatever the choice and the origin, in most cases, scores in Foreign language have less impact for girls than for boys.
- After a high school diploma in Humanities, scores in Humanities have less impact for girls than for boys, but after a high school diploma in Economics or in Sciences, they have more impact for girls than for boys.

So, test scores have in most cases more impact for boys, except for test scores in Humanities. Boys rely more than girls on test scores that are relevant both for the study path of origin and for the study path of destination, particularly when choosing a selective post-secondary pathway.

6. Robustness checks

6.1. Endogenous test scores

So far, we have considered that the different test scores measure perfectly the pupil's skills at any time so that the econometrician, as well the pupil, perfectly observes individual skills which somewhat allow us to consider test scores as exogenous variables. However, test scores are probably a composite measure as they mix the true ability and the effort made by the pupil. For instance, true abilities may be viewed as the return to effort. If the effort was observed, it should be introduced as an additional regressor, otherwise it must be considered as a part of the error term. In this case, test scores are correlated with the error term and thus endogenous. Even a measure of the global effort is not sufficient: if the pupil has a strong (unobserved) taste for a given subject, he/she will probably both increase his/her effort in this subject and be more likely to choose a field of study accordingly, meaning that effort and choices are co-determined. Moreover, if a pupil underestimates his/her skill in a given subject, he/she might under-invest in the subject in terms of effort, ending up with lower test scores and being less likely to choose this field of study.

In order to deal with potential endogeneity of test scores, we use as instrumental variables test scores obtained at the beginning of junior high school (grade 6) for the high school choice. Our identifying assumption is that there is no strategic choice of effort at this age, in the sense that pupils do not choose different levels of effort in Sciences and Humanities during primary school while anticipating future choices. Thus, these test scores represent the true abilities plus a white noise (at this age). It is of course possible that parents influence both differentiated efforts and future choices, but we think that this phenomenon is weakened by the French educational system before junior high school. First, written homework is not allowed in primary school in France, which greatly reduces parents' influence over the effort of the pupil. Second, before junior high school, pupils learn the basics of Mathematics and French. So it seems likely that pupils learn both subjects with a similar intensity (even if it differs across pupils). Third, in France, before junior high school, only one teacher is in charge of the class for all subjects. Finally, the beginning of junior high school is the beginning of adolescence, when pupils' tastes develop and could have an impact on effort, to a larger extent than in primary school. Additionally, we control for involvement of both parents in homework, to take into account the potential differentiated influence of the mother and the father, that might appear in case of conveyed stereotypes.

We use the control function approach to take into account the possible endogeneity of test scores. We assume that the error term of the main equation (choice model) is the sum of an iid Extreme Value term and of a perturbation which is jointly normal with the stochastic part of the endogenous variables (test scores). In this case, Petrin and Train (2010) show that the resulting model is a mixed multinomial logit model with mixing over the intercept, where the first step residual is introduced as an additional regressor. The model is estimated by using the simulated maximum likelihood method. In practice, we first regress test scores in Mathematics and in French at the end of junior high school (end of grade 9) with test scores at the beginning of junior high school (grade 6) as instruments and on the other regressors. Likewise, we use as instruments for the interactions of test scores at grade 9 with the gender variable, the interactions of test scores at the beginning of grade 6 with gender. We then estimate the choice model after adding the control functions (residuals) as additional regressors[20]. Standard errors are computed by bootstrap (200 replications).

Regarding high school choices (see Table A3), the results are not very different from those obtained under the assumption of exogeneity for the General courses (Table 4), although the

[20]We have adapted the Stata mixlogit command by Hole (2007).

coefficients of the test scores are generally higher in absolute value, suggesting that test scores may be somewhat endogenous but that the problem is not important enough to substantially bias inference. Regarding the Technical courses, the effects are generally less precisely estimated, even if their sizes are similar. The only important difference concerns the choice of Vocational compared to General in Sciences which is now only driven by the test score in French, but not in Mathematics. Lastly, the coefficients of the interaction terms between test scores and gender do not differ from the exogeneous case, so the difference between boys and girls in the way they use the test score remains, even after taking into account potential endogeneity.

Regarding the higher education choices, we use, as an instrument for the test scores gained at the high school diploma, the test scores at the end of grade 9, and we restrict the analysis to choices after a course in Sciences, the size of subsamples was too small otherwise. The results (see Table A4) are quite similar to the exogeneous case (Table 5), but the standard errors are generally higher, so that, in general, only the effects of test scores in Sciences remain significant: a good test score in Sciences decreases the propensity of choosing another study path than a preparatory class, but the effect is attenuated for girls.

6.2. The choice of a preparatory class for Business schools

The larger size of the sample of students who hold a high school diploma in Sciences allows us to analyze their higher education choices in more detail, in particular by isolating preparatory classes in Economics (for Business schools) from other study paths[21]. The main difference is that while the gender variable almost always remains insignificant, it becomes significant for the preparatory class for Business schools: after controlling for test scores and after allowing their effects to differ between boys and girls, girls still display some preferences for Business schools (preparatory classes in Economics) over Engineering schools (preparatory classes in Sciences). One interpretation is that even if the gender wage gap after a Business school is as high as after an Engineering school, Business schools offer more job opportunities for girls, especially for those who have not attended the top-level schools, contrary to Engineering schools, and also more opportunities of wage increases. This particular choice might also be driven by intrinsic preferences for the subjects taught in Business schools or by social norms (girls "should" rather choose Business schools than Engineering schools).

[21]Detailed results upon demand.

6.3. Do boys and girls place different value on their expected wages?

We also examine whether boys and girls take differently into account the differences in expected wage between the different fields of study, by adding an interaction variable between the expected wage and the gender variable[22]. We find that the effect of the expected wage is slightly higher for girls than for boys, but the interaction term between the expected wage and gender is not significant[23]. In addition, results about test scores are not impacted.

7. Conclusion

Boys and girls take into account future earnings when choosing educational pathways, and once taken into account expected future earnings and differences in test scores valuation, no residual gender effects subsist. But they make markedly different educational choices and place different value on their test scores in the process. However, gender differences are less obvious on major choices (Sciences versus Humanities for instance), but more on the choice of a type of study path (in terms of selection at entry and possible length of studies), in high school as in higher education. This has probably the largest impact on the labor market.

Indeed, the way boys and girls perceive their test scores seems to affect the choice between General and Technical high school diplomas. As the General high school diploma in Sciences is the favorite course for all pupils on average, in particular because it opens up the largest number of post-secondary possibilities, girls choose this course in the same way as boys when their test scores allow it. When this is not the case, girls are more likely than boys to choose a course leading to another General high school diploma (Economics or Humanities) and avoid more/choose less often Technical or Vocational courses, when their score in Mathematics increases. On the contrary, they generally persist more in those Technical fields, when their score in Humanities increases. This means that girls value their scores more in Mathematics but less in Humanities at this stage. It also means that they think that their test scores in Mathematics will be more rewarded in General courses than in Technical courses, even when Mathematics seems to be more important in those later courses. This result partly explains why girls are more present in courses leading to the high school diploma in Economics or Humanities.

[22]Detailed results upon demand.

[23]Computing an idiosyncratic expected earnings variable, Montmarquette, Cannings, and Mahseredjian (2002) show that this variable is essential in the choice of a college major. But contrary to our result, they also find that women are less influenced by this variable compared to men.

The main gender differences appear in higher education choices. Test scores have generally a strong impact only in the choice between the most prestigious pathways (preparatory classes) and other study paths, but much less among those other study paths. Moreover, in almost all cases, test scores (in Sciences, but also in Foreign language) have more impact for boys, except for scores in Humanities. In particular this means that boys value more their (perceived) skills (as measured by test scores) when they have to choose between a prestigious/competitive and a less prestigious/competitive study path. Additionally, when comparing subject choices, boys use/value their scores more than girls in situations where they are relevant (scores in Sciences when choosing Sciences versus Humanities/Economics, and scores in Humanities when choosing Humanities/Economics versus Sciences). These results are still true when one takes into account the possible endogeneity of test scores. Our results seem to support the idea that girls might under-estimate (or at least value less) their abilities in Sciences, but over-estimate their abilities in Humanities when choosing the most prestigious and competitive pathways leading to the high-ranking jobs. In other words, girls consider their talent in Humanities more than boys as a good signal that they can succeed in preparatory classes, while boys use their skill in Sciences more often to decide to enroll in those study paths.

One possible interpretation of these results is that girls suffer from a stereotype that makes them think they are less able than boys (and conversely boys think they are more able than girls), especially in Sciences, so that they place less value on their test scores in Sciences than boys. This explains why girls less frequently choose the preparatory classes for the most prestigious schools, and also Sciences at university, even if they perform as well or better than boys. However, the comparison of the effects of test scores does not allow us to fully test the presence of the stereotype against other types of explanation, for example, that there exist some social norms that specify that boys and girls highly skilled in Sciences should make different educational choices in line with a gendered vision of the society. Consequently, the next step is to estimate a structural model that would allow us to disentangle these two explanations. Another possible extension is to explicitly take into account the fact that observed choices do not necessarily correspond to pupils' wishes.

Our results suggest that reducing the gender wage gap after a given diploma could reduce the differences in educational choices of boys and girls, as pupils take expected wages into account when making their choices. This would in turn reduce the (unconditional) gender wage gap, through educational choices. But this might not be sufficient to change educational choices, as pupils also value test scores differently. Finding ways to improve girls' perceptions of their skills, in particular

in Sciences, or at least to make them value more their relevant test scores when choosing their higher education pathways, could increase their enrollment in study paths leading to the high-ranking jobs. For example, this could consist in providing information directly focused on the stereotype. Such actions could play an important role in reducing sex segregation in education, and ultimately the gender wage gap.

Appendix

Tables A1-A4

Table A1: Hours of teaching per week and weighting given to each subject at the high school diploma. Only the General courses are shown.

	Hours per week Grade 11[1]	**Hours per week Grade 12[2]**	**Weighting at the high school diploma[3]**
General high school course in Sciences			
Mathematics	5	5,5 (+2)	7 (9)
Physics-Chemistry	4,5	5 (+2)	6 (8)
Life and Earth Sciences OR	4	3,5 (+2)	6 (8)
Engineering Sciences	8	8	9
French	4		tests: written 2; oral 2
Philosophy		3	3
History Geography	2,5	2,5	3
Foreign Language 1	2	2	3
Foreign Language 2	2	2	2
General high school course in Humanities			
French and Literature	6	-	tests: written 3; oral 2
Literature	-	4	4
Philosophy	-	7	7
History Geography	4	4	4
Foreign Language 1	3,5 (+2)	3 (+2)	4 (8)
Foreign Language 2 OR	2 (+2 or 3*)	2 (+2 or 3*)	4 (8)
Latin	3 (+3)	3 (+3)	(4)
Mathematics-computing	2	-	2
Science	1.5	-	2
Ancient Greek	(3)	(3)	(4)
Foreign Language 3	(3)	(3)	(4)
Arts	(5)	(5)	(6)
General high school course in Economics			
Economics and Social Sciences	5 (+2)	6 (+2)	7 (9)
History Geography	4	4	5
French	4	-	tests: written 2; oral 2
Philosophy	-	4	4
Mathematics	3 (+2)	4 (+2)	5 (7)
Foreign Language 1	2,5 (+2)	2 (+2)	3 (5)
Foreign Language 2	2 (+3)	2 (+3)	2 (4)
Science	1,5	-	2

Main mandatory classes.
Facultative options and classes given to specific high schools not shown.
[1]: in 2000/2001. [2]: in 2001/2002. [3]: Weightings before 2013
In parentheses: if the subject is chosen as a specialty. Pupils have to choose one specialty.
*: depending whether Latin chosen or not.

Table A2: High school choices with exogenous test scores (at grades 8 and 9). Reference: Sciences

	General stream			**Technical stream**				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Sciences REF	**Humanities**	**Economics**	**Industrial**	**Tertiary**	**Laboratory**	**Medical Social**	**Vocational**
Expected wage	0.0035**							
	(0.0015)							
Girl		1.11	0.74	-4.85***	0.50	-0.26	3.32**	0.52
		(0.954)	(0.633)	(1.362)	(0.697)	(1.510)	(1.609)	(0.792)
Test score Maths		-0.77***	-0.41***	-0.23***	-0.48***	-0.44***	-0.56***	-0.54***
		(0.044)	(0.030)	(0.030)	(0.034)	(0.086)	(0.146)	(0.032)
Test score Hum		0.50***	0.12***	-0.41***	-0.18***	-0.26**	-0.13	-0.48***
		(0.063)	(0.036)	(0.035)	(0.042)	(0.112)	(0.121)	(0.040)
Test score Maths		0.01	-0.04	-0.13*	-0.16***	0.08	-0.01	-0.18***
*Girl		(0.053)	(0.040)	(0.079)	(0.046)	(0.109)	(0.152)	(0.046)
Test score Hum		-0.05	-0.02	0.32***	0.13**	-0.10	-0.09	0.09
*Girl		(0.074)	(0.046)	(0.113)	(0.055)	(0.135)	(0.133)	(0.056)
Age grade 6		0.40***	0.35***	0.49***	0.51***	0.47**	0.96***	1.17***
		(0.114)	(0.089)	(0.124)	(0.103)	(0.225)	(0.168)	(0.103)
Born abroad		0.03	-0.27	-0.53	-0.27	-0.41	-0.68	-0.68**
		(0.255)	(0.247)	(0.408)	(0.279)	(0.753)	(0.550)	(0.275)
Father education:								
Ref:<Primary school								
Primary school		-0.12	0.22	0.30	0.40**	0.23	-0.07	0.34*
		(0.200)	(0.173)	(0.228)	(0.180)	(0.412)	(0.300)	(0.175)
Junior high school		-0.16	0.38**	0.08	0.31*	0.03	0.03	0.10
		(0.182)	(0.155)	(0.229)	(0.175)	(0.435)	(0.298)	(0.175)
Vocational certificate		-0.44***	0.09	0.47***	0.25*	0.36	0.14	0.32**
		(0.140)	(0.122)	(0.171)	(0.137)	(0.321)	(0.222)	(0.133)
High school graduate		-0.51***	-0.07	-0.13	-0.17	-0.37	-0.57*	-0.54***
		(0.162)	(0.135)	(0.202)	(0.162)	(0.417)	(0.309)	(0.168)
2 years of college		-0.68***	-0.12	-0.04	-0.30	-0.15	-0.96**	-1.01***
		(0.181)	(0.144)	(0.224)	(0.186)	(0.471)	(0.419)	(0.209)
$\geq$ 3 years of college		-0.81***	-0.37***	-1.27***	-1.19***	-1.14**	-1.22***	-2.48***
		(0.164)	(0.136)	(0.249)	(0.206)	(0.454)	(0.383)	(0.249)
No info		-0.36	0.19	0.50	0.09	-0.08	-1.19	-0.10
		(0.353)	(0.288)	(0.370)	(0.324)	(0.790)	(0.779)	(0.300)
Mother education:								
Ref:<Primary school								
Primary school		-0.13	0.33	-0.12	0.35	0.47	0.02	0.11
		(0.259)	(0.240)	(0.274)	(0.218)	(0.505)	(0.398)	(0.213)
Junior high school		0.03	0.34	0.17	0.22	-0.05	0.08	0.12
		(0.241)	(0.229)	(0.252)	(0.207)	(0.499)	(0.383)	(0.202)
Vocational certificate		0.05	0.51**	0.24	0.16	0.00	0.38	-0.09
		(0.230)	(0.220)	(0.237)	(0.198)	(0.474)	(0.362)	(0.193)
High school graduate		-0.13	0.31	-0.12	-0.38*	-0.13	-0.48	-0.84***
		(0.236)	(0.220)	(0.245)	(0.207)	(0.482)	(0.397)	(0.207)
2 years of college		-0.22	0.00	-1.04***	-0.92***	-0.95*	-0.62	-1.38***
		(0.239)	(0.223)	(0.270)	(0.220)	(0.558)	(0.414)	(0.224)
$\geq$ 3 years of college		0.14	0.21	-0.77**	-1.45***	-0.58	-1.06*	-1.44***
		(0.254)	(0.232)	(0.303)	(0.297)	(0.558)	(0.539)	(0.294)

Table A2 *(continued)*

	General stream			Technical stream				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Sciences REF	**Humanities**	**Economics**	**Industrial**	**Tertiary**	**Laboratory**	**Medical Social**	**Vocational**
Ref.: often pleased with myself: not at all								
Not so pleased		0.03	0.16	0.77*	0.33	0.19	-0.10	0.38
		(0.228)	(0.201)	(0.395)	(0.240)	(0.561)	(0.345)	(0.248)
Quite pleased		0.08	0.23	1.13***	0.66***	0.45	0.02	0.94***
		(0.237)	(0.208)	(0.392)	(0.249)	(0.581)	(0.363)	(0.255)
Very pleased		0.01	0.21	1.07**	0.57**	-0.10	0.39	1.19***
		(0.290)	(0.244)	(0.417)	(0.285)	(0.722)	(0.439)	(0.284)
Ref.: feel not at all able to do things as well as others								
Not so able		0.50	0.12	-0.47	0.14	-0.77	0.45	0.17
		(0.329)	(0.300)	(0.417)	(0.325)	(0.644)	(0.522)	(0.323)
Quite able		0.22	0.31	-0.76*	0.01	-0.52	0.53	0.14
		(0.324)	(0.292)	(0.397)	(0.316)	(0.611)	(0.508)	(0.314)
Very able		0.48	0.48	-0.62	0.29	-0.10	0.91*	0.29
		(0.330)	(0.297)	(0.398)	(0.321)	(0.623)	(0.515)	(0.317)
Ref.: not at all influenced by others' opinion								
Not so influenced		-0.01	0.10	0.17	0.15	0.12	0.04	0.07
		(0.096)	(0.077)	(0.112)	(0.092)	(0.233)	(0.172)	(0.093)
Quite influenced		0.01	0.02	0.03	0.17	0.23	0.11	0.13
		(0.142)	(0.114)	(0.163)	(0.133)	(0.302)	(0.235)	(0.134)
Very influenced		-0.37	-0.08	0.15	-0.04	0.60	0.49	0.40
		(0.295)	(0.227)	(0.315)	(0.262)	(0.475)	(0.377)	(0.247)
Repeated a grade		0.65***	0.39**	0.87***	1.41***	0.74***	1.43***	1.66***
		(0.171)	(0.153)	(0.160)	(0.142)	(0.278)	(0.205)	(0.143)
Help homework:								
Mother: regularly		0.20*	0.14	-0.09	0.24**	0.24	0.28	0.27***
		(0.108)	(0.086)	(0.119)	(0.101)	(0.239)	(0.175)	(0.100)
Father: regularly		-0.10	0.06	0.21	-0.13	-0.12	0.07	-0.04
		(0.154)	(0.118)	(0.160)	(0.144)	(0.353)	(0.248)	(0.142)
Constant		-1.41	-0.54	3.08*	2.50	1.85	-6.26**	-0.35
		(1.721)	(1.303)	(1.829)	(1.556)	(3.017)	(2.719)	(1.587)
Observations	9365	9365	9365	9365	9365	9365	9365	9365

The coefficients are reported.
Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table A3: High school choices. Endogeneous test scores. Standard errors are corrected using bootstrap.

	General stream			**Technical stream**				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Sciences REF	**Humanities**	**Economics**	**Industrial**	**Tertiary**	**Laboratory**	**Medical Social**	**Vocational**
Test score Maths		-1.34***	-0.67***	-0.21***	-0.81***	-0.49***	-0.97***	-0.17
		(0.071)	(0.044)	(0.076)	(0.072)	(0.144)	(0.202)	(0.115)
Test score Hum		1.15***	0.37***	-0.68***	-0.12	-0.38	0.07	-2.08***
		(0.134)	(0.113)	(0.144)	(0.131)	(0.259)	(0.256)	(0.174)
Test score Maths		0.01	-0.05	-0.14	-0.16***	0.08	0.00	-0.14**
*Girl		(0.060)	(0.041)	(0.116)	(0.053)	(0.129)	(0.172)	(0.061)
Test score Hum		-0.04	-0.01	0.34**	0.14***	-0.09	-0.08	0.02
*Girl		(0.081)	(0.045)	(0.136)	(0.054)	(0.130)	(0.176)	(0.062)
Observations	9365	9365	9365	9365	9365	9365	9365	9365

Bootstrapped standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Only the coefficients of the test scores are displayed.

Table A4: Higher education choices, conditional on a high school diploma in Sciences.
Endogenous test scores. Standard errors are corrected using bootstrap.

	Prepa class Sciences REF	Prepa class Eco&Hum	Health, Medicine, Biology	Technical college, Sport	University Eco, law, Hum	University Sciences
Test score Humanities		0.71	0.70**	-0.14	0.23	0.10
		(0.440)	(0.337)	(0.251)	(0.324)	(0.283)
Test score Foreign Lang		0.40*	-0.30	-0.07	0.18	-0.25*
		(0.225)	(0.182)	(0.125)	(0.160)	(0.151)
Test score Sciences		-0.89***	-1.63***	-0.47***	-0.88***	-0.43***
		(0.194)	(0.285)	(0.124)	(0.173)	(0.134)
Test score Humanities		-0.09	-0.58***	-0.04	-0.33***	-0.03
*Girl		(0.153)	(0.156)	(0.105)	(0.126)	(0.117)
Test score Foreign Lang		-0.18	-0.02	-0.07	0.10	-0.08
*Girl		(0.115)	(0.091)	(0.072)	(0.082)	(0.084)
Test score Sciences		0.15	0.34***	0.09	0.16*	0.17**
*Girl		(0.115)	(0.107)	(0.069)	(0.088)	(0.081)
Observations	2449	2449	2449	2449	2449	2449

Bootstrapped standard errors in parentheses (200 replications)
Significant at 1%: *; at 5%: **; at 10%: ***
Only the coefficients of the test scores are displayed.

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