

Gender and Choices in Higher Education

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ABSTRACT

Data on the labor market outcomes of university graduates show that gender pay gaps appear soon after graduation in nearly every field of study. We provide descriptive evidence of a plausible cause of the gender starting-salary gap: choices *within* an educational setting that differ between male and female students, even after accounting for academic specialization. We examine the choices of undergraduate students at a selective French university who are competing for seats at foreign universities to fulfill a mandatory exchange program requirement. Holding fixed students' field of study, we find that average- and high-ability female students request exchange universities that are worse-ranked than their male peers. A survey eliciting students' preferences suggests that male students prioritize the academic characteristics of potential exchange universities more often, whereas similar female students consider both the academic and non-academic characteristics of exchange destinations. We explore the short-term consequences of these differing preferences using a simulation that assigns students to exchange seats solely on university ranking and students' academic performance. Female students' assignment improves almost uniformly; while top-performing male students face increased competition for seats, and male students with average grades face less competition as high-achieving female students shift towards better-ranked assignments.

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1 Introduction

Since the mid-2000s, more women than men have earned post-secondary degrees in nearly all OECD countries (Goldin et al., 2006; OECD, 2015). Despite the reversal in the gender educational attainment gap, college-educated men and women continue to experience substantially different labor market outcomes, beginning immediately after graduation. For example, between 2000 and 2010, the unadjusted gap between men and women’s starting salaries in the United States was 12% (Thornton et al., 2015). Women tend to specialize in fields that lead to jobs with lower earnings, fewer long-term contracts, and fewer management positions upon graduation; yet, the disparity in young graduates’ labor market outcomes persist even after accounting for differences in traditional measures of human capital acquisition, such as years of schooling and field of study (Daymont and Andrisani, 1984; Zafar, 2013). Indeed, even within degrees, male graduates earn more than women upon graduation (Corbett and Hill, 2012). Examining the 2016 graduating class of an economics master’s program across all universities in France only eighteen months after graduation, we find that women earned 13% less than their male classmates, and similar gaps have been reported for previous cohorts (Erb, 2016, 2018; Boring, 2017). The differences in men and women’s choices *within* educational settings, in addition to those already found in workplaces (Goldin, 2014; Azmat et al., 2020; Le Barbanchon et al., 2019; Petrongolo and Ronchi, 2020), likely contribute to the shrinking explanatory role of traditional measures of human capital (Blau and Kahn, 2017). This shrinking role of traditional measures has been a puzzle, given the persistence of the gender pay gap.

In this paper, we study male and female students’ choices within a given post-secondary educational program. We document gender differences in human capital acquisition that could affect students’ labor market outcomes but would not be captured by traditional measures of human capital. Analyzing data from a mandatory program at an elite French university, we find significant differences in male and female students’ choices *within* their field of study: women choose less competitive academic paths, and the difference is especially pronounced for students who have performed well in previous standardized assessments. Based on an analysis of detailed survey data, we attribute some of the observed differences in choices to differences in male and female students’ preferences. Although women in our data are academically ambitious, women’s survey

responses suggest that they also value other dimensions of their post-secondary experience. These multi-dimensional priorities generate trade-offs—for example, between academic rigor and quality-of-life—leading women to make choices that appear overall less academically ambitious than their male counterparts.

Our analysis relies on data from Sciences Po, a top-ranked French university that offers an undergraduate degree in social sciences.¹ We focus on students' choices for a mandatory third-year study-abroad program in which students spend a full academic year at one of nearly 400 participating foreign universities. To participate in the exchange, students submit a ranked list of six universities offering a limited number of seats. Program administrators assign students to exchange destinations, giving priority to students' first-ranked choices. Students' exchange destinations do not affect their university enrollment or graduation and are therefore not captured by traditional educational attainment data. However, their exchange choices have post-graduation consequences: studying abroad is associated with greater labor-market payoffs (Di Pietro, 2019), and future employers may see the reputation of an applicant's exchange university as a signal of the candidate's quality (MacLeod et al., 2017).

We first explore the extent to which male and female students request similarly ranked universities. Holding fixed the field of study and accounting for individuals' underlying academic ability, we identify a statistically significant and economically meaningful difference in how male and female students vie for academic opportunities. Despite having better grades on average, we find that female students tend to request lower-ranked schools. The difference is especially pronounced among high-achieving students. That is, consistent with a gender gap in competition at the upper tail of the ability distribution (Buser et al., 2017), female students with strong academic histories are less likely to request the most prestigious exchange placements, even when they could likely secure those assignments.

To understand the mechanism underlying these gender differences in choices, we surveyed a cohort of Sciences Po students who were actively considering their choices for their upcoming exchange year. The survey elicits information about students' preferences for their exchange year; for example, the survey asks them to assess the relative importance of university prestige and discov-

¹The data were provided under a confidentiality agreement with Sciences Po; although we are restricted from sharing the data and identifying individual students, the agreement places no constraints on the conclusions of our analysis.

ering a new culture. While college education increases labor market opportunities, undergraduate programs often also present the opportunity for students to explore broader intellectual and personal interests. To identify gender differences in students' tastes for the exchange experience, we asked students about eighteen criteria in four categories: academics and professional ambition, cultural setting, campus life, and the location of the exchange university.

Our analysis of students' responses suggests that, relative to their male peers, female students value more diverse criteria than simply the academic ranking of the exchange university. Although female respondents rate academic criteria as highly as male respondents, female students more often also place substantial weight on other dimensions of the exchange year experience, such as enjoying the opportunity to live in a new country. These findings are consistent with results in the social psychology literature that suggest that women have more diverse educational and occupational interests than men and are more interested in pursuits beyond their careers (McCabe et al., 2019). Results are also consistent with the economics literature suggesting that gender differences in preferences explain part of the early career gender pay gap (Wiswall and Zafar, 2018).

Finally, we model the impact of female students' preferences on overall exchange program allocations using a simple simulation. Specifically, we consider a scenario where students' assignments are determined only by the world ranking of the exchange universities and the students' academic standing. That is, the simulation assigns students to schools that best match their relative academic ability. Because female students request lower ranked exchange universities than their male peers, the simulation assigns female students to higher ranked universities almost mechanically. The simulated allocation mechanism also affects male students' placements: high-achieving male students receive lower-ranked placements when they compete against similarly high-achieving female students. However, average-performing male students benefit from the ability-based allocation scheme, as they now compete against average-ability female students, instead of better-performing female students who were previously targeting mid-ranked exchange universities.

The patterns that we document are likely to be important in understanding gender differences in young graduates' labor market outcomes. The impact of female students' academic choices on their career outcomes may be subtle—a less impressive resumé upon graduation or less exposure to cutting-edge teaching and research may reduce a graduate's relative appeal in the labor market. If employers interpret education as a signal of candidates' quality (Spence, 1978; Weiss, 1995; Altonji

and Pierret, 2001; Knouse, 1994; Oliphant and Alexander III, 1982; Thoms et al., 1999) and also value other evidence of quality on an inexperienced applicants' resumés (Kessler et al., 2019), then our results suggest that these high-achieving female graduates' resumés may not impart their true ability and potential. More specifically, if employers compared applicants' exchange experience, a high-ability female student who attended a low-ranked exchange university would appear weaker on the job market than her equally able male classmates who attended an elite exchange institution. Signals such as the academic reputation of a university attended for an exchange program may make a large difference for employers (Behrman et al., 1996; Black and Smith, 2004, 2006; Brewer et al., 1999; Fitzgerald, 2000; Hershbein, 2013; Hoekstra, 2009; Monks, 2000; Zhang, 2005).

The remainder of the paper is organized as follows: Section 2 further motivates the study with facts about gender differences in the labor market outcomes of young graduates in France. Section 3 describes the exchange program at the French university where we focus our analysis. Section 4 describes the exchange program choice data, and Section 5 presents the results of our analysis of gender differences in the choice data. Section 6 describes the survey that we conducted with Sciences Po students and considers students' preferences over exchange program criteria. We discuss our results in Section 7, using a simple simulation that models the impact of female students' preferences on overall allocations. Section 8 concludes.

2 Gender differences in labor market outcomes in France

This paper is motivated by the persistent gender disparity in labor market outcomes, and our empirical work focuses on the preferences and choices of French undergraduate students. In this section, we document the patterns of gender-based employment disparity in France, the labor market into which the Sciences Po students graduate, using post-graduation data for institutions in the French post-secondary system.

We examine data across Higher Education in France: most students attend a public university; many top-performing students in management and engineering attend a *Grande école* after passing a competitive entrance exam or completing two years of preparatory studies; and Sciences Po, the setting for our main empirical analysis and survey, is an elite research university often considered to be as academically prestigious as the *Grandes écoles*. Across all types of institutions—public

universities, *Grandes écoles*, and Sciences Po—we document systematic gender differences in labor market outcomes after graduation.

Public universities

We document substantial differences in young male and female workers’ employment and wages in France using administrative and survey data from the French Ministry of Higher Education.² The data include recent graduates’ median starting wages, employment rates, management positions, and job stability by gender and field of study.

In the 2017–18 academic year, nearly 1.7 million students were enrolled at French public universities (Panel A of Appendix Table A1). Students’ fields of study were diverse, including health (16.7%), sciences (16.4%), engineering (9.6%), social sciences (44.3%), and the humanities (13%). Law was the most popular degree program, capturing 10.1% of all enrollments.³ Male and female enrollment varies across fields; Panel B of Appendix Table A1 reports total and female enrollment by field for the 2017–2018 academic year. Relative to total enrollments, where women represent 55.7% of the student population, women are over-represented in the humanities, most social sciences, and health-related studies.⁴ In contrast, women are underrepresented in many fields related to sciences and engineering.⁵

Gender differences in labor market outcomes can be explained, in part, by the fact that women tend to specialize in lower paying fields (Daymont and Andrisani, 1984; Turner and Bowen, 1999; Joy, 2003; Altonji et al., 2016; Zafar, 2013). Figure 1 plots the negative correlation in the relation of median wage of graduates and the percentage of women, by field of study, eighteen months after graduation in 2016. Most of the higher paying degrees are in sciences and engineering—fields in which women are the minority. Instead, female students are enrolled in fields with very low labor market prospects. In the 2017–18 academic year, 27.2% of female students at public universities in

²The administrative data are available at: <https://data.enseignementsup-recherche.gouv.fr/explore/dataset/fr-esr-principaux-diplomes-et-formations-prepares-etablisements-publics/information/>. The survey data are available at: <https://data.enseignementsup-recherche.gouv.fr/explore/dataset/fr-esr-insertion-professionnelle-master-donnees-nationales/information/>. The survey includes the responses of 29,845 Master’s degree students who graduated from a public university in France in 2016.

³The French higher educational system includes public universities, highly selective “Grandes écoles,” and private schools. Students can study most fields in any type of institution, except Law and Medicine, which are almost exclusively studied at public universities.

⁴The field of study with the largest share of female students is psychology; women represented 80.7% of the nearly 63,500 psychology students in 2017–18. Approximately 66.6% of the nearly 172,000 law students are women, and 63.6% of the nearly 135,000 students in health-related fields are women.

⁵Women represent 15.4% of the nearly 47,000 students in computer science and 27.9% of the 99,000 students in industrial sciences and technology.

France studied languages, literature, the arts, and social sciences; in contrast, only 15.4% of male students chose one of those fields.

Table 1 shows the labor market prospects of graduates in the lowest and highest paying fields in Panels A and B, respectively. Fields with low pay are also associated with fewer full-time positions, relatively less stable appointments, and fewer management opportunities. The difference between the final column of Panels A and B is most striking: Women are over-represented in nearly every low paying field and, conversely, men are over-represented in nearly every field with high labor market returns. For example, a Master’s degree in mathematics often leads to stable, full-time employment, high wages after graduation, and management responsibilities, and 73% of Master’s students in mathematics are male.

Women tend to specialize in fields with lower earnings, yet there is a gender pay gap even *within* fields. Figure 2 depicts the gender pay gaps within fields, eighteen months after graduation. Across nearly 30,000 recent graduates in the survey, the median wage for women was 11.9% lower than for men.⁶ Men earn more than women in all 21 fields for which there were at least 80 female and 80 male survey respondents. Gender pay gaps exist even within fields where women are over-represented. For instance, eighteen months after graduation, female psychology graduates earn 7.4% less than their male counterparts. Specialization may partly explain the gender pay gap within fields of study (Erb, 2018). For example, the large pay gap in economics, where male graduates earn 13% more than female graduates, can be explained by differences in subfields: in the U.S. market, more men specialize and take high-paying jobs in finance, whereas women specialize in fields leading to lower paying jobs in local government.⁷

Grande écoles

Gender differences in labor market outcomes also exist among graduates of France’s most elite universities. The French post-secondary system divides students between two tracks. While most students attend public universities, top performing students in fields such as management and engineering often attend a *Grande école* after passing a competitive entrance exam or completing two years of preparatory school. The *Conférence des grandes écoles*, an association of 132 engineering,

⁶To calculate the percent difference in starting wage, we divided the difference in men’s and women’s median wage by the median wage earned by men, by field of study, as reported by the Ministry.

⁷This comparison reflects the median wage in the U.S. labor market for economists, as reported in the Occupational Outlook Handbook, published by the U.S. Department of Labor’s Bureau of Labor Statistics and available online at: <https://www.bls.gov/ooh/life-physical-and-social-science/economists.htm>.

35 business and 9 other schools in France, conducts a yearly survey of labor market outcomes for its young graduates.⁸ Like the female graduates of public universities, women from elite schools report worse labor market outcomes than male graduates, and there has been little improvement over time. A year after graduation, 11.5% of female respondents are still actively seeking employment, compared to 7.8% of male respondents. Even once employed, female engineering and management graduates' starting salaries (including bonuses) are approximately 8.5 and 13% lower than their male counterparts, respectively. Like public university graduates, women with degrees from *Grandes écoles* hold fewer management positions than men and are more likely to be employed on short-term contracts.

Sciences Po

Our main analysis focuses on students' choices at Sciences Po, a top-ranked French university, and the gender differences in labor market outcomes of Sciences Po graduates match those of graduates of public universities and *Grande écoles*. A recent survey of Sciences Po graduates shows that women earn 15.8% less than men, one year after graduation.⁹ As we noted above for public universities, the wage differential is partly explained by students' specialization and differences in the sectors in which male and female students find employment after graduation. Nevertheless, a substantial gap remains unexplained after accounting for academic specialization. In the remainder of the paper, we study the choices made by Sciences Po students during their undergraduate studies and document patterns that may lead to different human capital accumulation or labor market signals.

3 Sciences Po's exchange program

Sciences Po's undergraduate programs are located on campuses across seven cities in France.¹⁰ Paris has the largest campus with 880 to 955 students starting a three-year undergraduate program each year of our study (2012–2015). The satellite campuses, which each serve cohorts of 46 to 148

⁸The survey is available online at: <https://www.cge.asso.fr/themencode-pdf-viewer/?file=https://www.cge.asso.fr/wp-content/uploads/2018/06/2018-06-19-Rapport-2018.pdf>.

⁹The 2019 report for the cohort that graduated in 2017 is available online here: <https://fr.calameo.com/read/0041604542ec12d5ae1c9>.

¹⁰The Sciences Po students are in Paris for general studies and dual degree programs with French partner universities, Paris for the Europe-Africa program; Dijon for the Central and Eastern Europe program; Le Havre for the Europe-Asia program; Menton for the Middle East and Mediterranean program; Nancy for the European Franco-German program; Poitiers for the Europe-Latin America program; and Reims for the Europe-North America program.

students, aim to foster exchange between young Europeans and students from other regions of the world.

Since 2000, all Sciences Po students have spent their third year of study either attending one of nearly 400 foreign exchange universities or completing an internship abroad.¹¹ During our period of study, 83.5% of students chose to study abroad. In the sections below, we describe the broad context for the exchange program and the assignment mechanism.

3.1 Academic context

Foreign exchange placements are determined during students' second year of study. In December, students are asked to rank six universities in order of preference, and the administration announces the assignments in February. Student applications include the six requests, a two-page motivation letter, a CV, high school and Sciences Po transcripts, and official results of the language tests required by the foreign universities on the student's list.

Early in the Fall semester, before the students' December deadline, administrators explain the exchange assignment process to the students through live meetings and a dedicated website. Students receive some information about the following key features of the allocation mechanism: Administrators first consider universities for which there is excess demand (i.e. more student interest than available seats) and generally give priority to students' first choices. For example, if three students ask for a university as their top choice and only one spot is available at that institution, then one of these three students is most likely get the spot and not a student who asked for the university as their second choice. Moreover, among the set of k^{th} -choice requests for a given university, priority is given to students with the highest grades, most compelling motivation letters, and most promising academic trajectories. If a student is not assigned to any of his or her requested exchange universities, then administrators and the student jointly choose a university with available seats after all other students have been assigned; less than 1% of students end up in this situation.

Students across the Sciences Po campuses receive slightly different direction in terms of exchange destinations; in practice, however, there are few restrictions. The main program in Paris does not follow a geographic theme and, as a result, students on the Paris campus are unconstrained in

¹¹The exchange program was partially suspended during the 2020–2021 academic year due to COVID-19.

their choices for the international exchange. While administrators expect European students on the satellite campuses outside of Paris to spend their third year in a country that matches the geographic theme of their program and non-European students to spend their third year in Europe, there are exceptions to this restriction and students are relatively free to choose across the many available exchange universities.

3.2 Exchange seat availability

Exchange universities offer a limited number of seats to Sciences Po students, and second-year students who are preparing their requests receive information about the supply of seats in the previous year. Although the exact number of available seats may change slightly each year, the previous year's seat counts are a good estimate of the supply of seats in the current year. On average, exchange universities offer 3.7 seats, with 35% of programs offering 2 seats. Students may schedule appointments with Sciences Po staff to ask specific questions about the exchange universities.

3.3 Peer information

When requests for an exchange university exceeds the number of available seats, priority is generally given to students with the strongest academic performance. Whereas program administrators have students' official transcripts, students themselves have imperfect information about their relative academic standing in their cohort. Sciences Po does not publish official student rankings. Instead, students obtain a score out of 20 points in each course and, by course and campus, know whether their grade falls above the 90th percentile, between the 65th and 90th percentile, between the 35th and 65th percentile, between the 10th and 35th percentile or below the 10th percentile.¹²

Students' requests for exchange universities are submitted simultaneously, and there is no central clearinghouse for information about students' intended or official requests. Nevertheless, satellite campus cohorts are small, and students may be relatively well informed about their classmates' requests for the exchange program. In contrast, the Paris campus cohort is large, and students may be less likely to know their classmates' exchange program requests.

¹²Students may also have more informal information about their relative standing. On the Paris campus, first-year students take their mandatory classes with a fixed set of 14 to 22 peers, called a "triplet"; the satellite campuses are significantly smaller, with 46 to 148 students each year of the program.

3.4 Allocation mechanism and students' choice

In assigning students to exchange universities, program administrators give priority to students' first choice. The mechanism, similar to the "Boston mechanism" used in other educational settings (Abdulkadiroğlu et al., 2005; Abdulkadiroğlu and Sönmez, 2003), may generate strategic behavior (Ergin and Sönmez, 2006; Pathak and Sönmez, 2008). More specifically, consider a student who is not assigned his first choice of exchange universities. He may also not be assigned to his second choice if all of those seats were filled by other students who listed that university as their first choice, *even if* the student would have been assigned a seat had he listed it as his *first* choice, too. As noted in the literature, this mechanism has the potential both to change the ranking of requests and disadvantage those who fail to take account for others' strategic behavior. In our setting, students' rankings may also reflect their preferences and perception of their own academic standing in the cohort.

In the most straightforward cases, students seeking the most academically ambitious or prestigious exchange experience may request better-ranked schools first; indeed, 65% of the students in our data order their requests by university ranking. Relatively risk-averse students or those who underestimate their academic standings may anticipate being denied their true top choice and request instead a worse-ranked placement. Alternatively, students with relatively weak academic standing may request better-ranked universities if their second choice is likely to have an excess supply of seats and there is little risk in first requesting a better-ranked destination. Attitudes towards competition, risk, academic confidence and other preferences may affect students' stated choices and, as a result, the likelihood that they are assigned their top choice. In our data, female students are assigned to their top choice more often than male students: 70.2% of female students are assigned their top choice, whereas 64.4% of male students are assigned their top choice. This difference is statistically significant ($p < 0.01$).

4 Data

We examine gender differences in students' choices using detailed student and exchange program data from Sciences Po. In Section 4.1, we describe the student data, which include students' gender, admission status, citizenship, campus and standardized first-year grades, as well as their choices

in order of preference and final exchange assignment. We also have data on the number of seats available at each exchange university, which we describe in Section 4.2. In Section 4.3, we discuss how we match exchange universities to international academic rankings.

4.1 Students

We have demographic and educational data for Sciences Po students who were in their second year of undergraduate studies between 2012 and 2015. Our data include the exchange program requests, ordered by preference, for 3,401 students.¹³ Another 674 students chose to complete an internship instead of participating in an international exchange.¹⁴

Table 2 presents summary statistics for the 3,401 students who participated in the exchange program in Panel A, reporting separately for each of the eight campuses and programs across France in Panel B and by academic year in Panel C. For completeness, summary statistics for students who completed an internship are reported in Panel D.

Overall, 57% of Sciences Po students are female, and there is little variation in female enrollment across campuses and academic years. By design, students admitted to the Paris campus are residents who graduated from a high school in France; most students on this campus are therefore French citizens (90%). Students who completed high school outside of France are only eligible admission to programs on satellite campuses, regardless of their citizenship. For example, 83% of students on the German campus completed high school outside of France. International students and those who graduated from high school outside of France are likely to have experienced non-French education and/or culture prior to Sciences Po, which may lead them to make different

¹³The raw data from Sciences Po includes 4,232 students, 3,432 of whom participated in the exchange program. Among the exchange participants, 251 students submitted fewer than six choices; 203 students submitted five choices. Our main analysis includes all students who submitted a first choice, regardless of the completeness of their subsequent requests. We exclude the 29 students who failed to submit their first choice, 24 students who did not submit choices because they were enrolled in a dual degree with a French university and chose to study abroad through the other university's exchange program, and two students for whom first-year grades are missing. An additional 102 students were enrolled in an international dual degree program with a pre-specified partner university and, as a consequence, did not submit choices for the larger Sciences Po exchange program. Results are virtually identical if we exclude all students who submitted fewer than six choices or, for students with missing choice data, assume that these students' first choice was their next available choice.

¹⁴To examine students' choice between an internship and the international exchange, we regressed an indicator for having chosen to study abroad on students' gender, first-year grades, and their interaction, as well as citizenship, admissions type, and cohort-year fixed effects. The coefficient estimates from the linear probability specification are reported in Appendix Table A2. We find no evidence that male and female students differ in their choice to study abroad vs. complete an internship. However, students with lower first-year grades are significantly more likely to choose an internship ($p < 0.01$).

choices than their peers with different backgrounds. As such, in our analysis, we account for both citizenship and the procedure through which a student was admitted to Sciences Po.¹⁵

Students take a common set of first-year classes, and we use the standardized scores from these classes to account for students' academic standing in our analysis of exchange program choices. Across all campuses and years, female students earn significantly higher scores than male students ($p < 0.01$). Whereas male students on the Mediterranean campus in Menton earn significantly higher grades than their female classmates ($p = 0.02$), the opposite is true on the substantially larger main campus in Paris ($p < 0.01$). Pooling all of the Sciences Po campuses, female students earned higher first-year scores in each of the three academic years in our data; the difference is statistically significant in 2012–13 ($p = 0.02$) and 2014–15 ($p < 0.01$).¹⁶

4.2 Exchange program

The administration provides second-year students with the names of the exchange universities, as well as information about the number of seats at each university in the previous year.¹⁷ This historical data is informative; there is little variation in the number of seats available each year. On aggregate, there is an excess supply of seats in the exchange program: 1,575 seats were open to 1,115 students in 2012–2013; 1,707 seats were open to 1,187 students in 2013–14; and 1,725 seats were open to 1,130 students in 2014–15.¹⁸

Although seats are generally plentiful, availability varies by region. Table 3 reports the distribution of seats by region. The most seats are available at U.S. universities, followed by institutions in western Europe, the U.K., Ireland, and Latin America. Competition for seats also varies across regions. Table 3 reports top-choices by region for male and female students. Approximately 25% and 20% of male and female students, respectively, rank a U.S. university as their first choice. Although these summary statistics suggest that excess demand for seats may be especially prevalent for U.S. exchange universities, these aggregate figures obscure institution-specific demand. At least

¹⁵Students can earn admission in one of four ways: through an entrance exam, an international application process, an affirmative action program, or through a dual degree program with another university.

¹⁶The distribution of grades is also different for male and female students; pooling all campuses and academic years, a Kolmogorov–Smirnov test also rejects the equality of the distributions in 2012–13 and 2014–15 ($p < 0.01$ for both).

¹⁷Appendix Table A3 lists a subsample of exchange universities that were available during one of the years in our data.

¹⁸These student counts differ from those in Panel C of Table 2 because the former includes all students, whereas the latter includes only students for which exchange program data are available.

one seat remains unfilled at more than half of the U.S. exchange universities. On average, U.S. universities with at least one unfilled seat are worse-ranked than U.S. universities whose exchange seats are all filled; however, seats remain unfilled at several very well-ranked universities each year.

4.3 Exchange university rankings

To compare the academic prestige of exchange destinations, we match the exchange universities to the QS World University Rankings for Social Sciences and Management, published by Quacquarelli Symonds, which assigns ranks to 400 universities across the world.¹⁹ To account for the information available during students' decision-making period, we use exchange universities' rank from the year in which the students made their exchange request. To create a linear ranking of university quality, we match exchange institutions to their QS rank and then re-rank them to eliminate gaps. We assign the worst rank (rank 198 in 2012; 210 in 2013; and 218 in 2014) to all unranked universities.

Table 4 reports the mean and standard deviation of the world ranking of the exchange universities requested by male and female students, by the priority of the choices. On average, female students request worse-ranked exchange universities. Female students' top-choice university is, on average, ranked 101.3, whereas male students' first choice ranks 92.8 ($p < 0.01$). The difference between the world ranking of male and female students' requested universities narrows down the list—by students' sixth choice, the difference between the rankings of the requested exchange universities is small in magnitude and not statistically significant ($p = 0.25$). Kolmogorov-Smirnov tests also reject the equality of the distribution of rankings for male and female students' top four choices but fails to reject the null hypothesis of equal distributions for the fifth and sixth choices.

Female students' requests for worse-ranked exchange universities do not reflect worse academic standing. First, the summary statistics in Table 2 suggest that, on average, female students earn higher grades than their male classmates. Second, the difference is not being driven, for example,

¹⁹Prominent university rankings—the QS World University Rankings, Times Higher Education Rankings and Shanghai Academic Ranking of World Universities—differ in terms of coverage but publish rankings that are highly correlated (Aguillo et al., 2010). The QS Rankings assign individual universities to ranks from 1 to 400. In contrast, the Shanghai Rankings assign individual universities to ranks from 1 to 100 and then assign universities to 50-place categories (e.g. rank 101–150 or 151–200). The Times Higher Education Rankings assign individual universities to ranks from 1 to 200 and then assign universities to 25-place categories (e.g rank 201–225 or 226–250). Because they cover more universities and match Sciences Po's academic fields, we rely on the QS Rankings as a measure of university quality.

by women with below-median grades requesting substantially worse-ranked universities than their male counterparts. Figure 3 presents binned scatterplots of the world ranking of the exchange university requested by students and students' first-year grades separately for male and female students (with world rankings plotted as a quadratic function of students' grades). Male and female students with relatively low first-year grades request similarly ranked exchange universities. However, among students with relatively high first-year scores, male students request substantially better-ranked exchange universities than their female peers. That is, the patterns in Table 4 result from differences among relatively high-achieving students.

Summary statistics suggest that, when ranking opportunities for an international academic experience, male and female students make different choices. In the following section, we account for other factors that could be driving the observed differences.

5 Analysis of Students' Choices

In this section, we examine the differences in male and female students' requests for exchange universities, after accounting for other factors—including their academic standing, classroom peers, and academic and cultural backgrounds—that could explain their choices.

5.1 Gender differences in the choices of universities

To examine the students' choices in the exchange program, we regress the rank of a student's top choice of exchange university on an indicator for the student's gender and his or her prior academic performance, as well as the fixed effects described below. Results are presented in Table 5. To account for correlation across classmates in a given year, standard errors are clustered by cohort in all specifications. On the Paris campus, a cohort is defined as the fixed set of 14 to 22 classroom peers, called a "triplet", assigned for all mandatory first-year courses; on the satellite campuses, a cohort includes all students on that campus in a given year.

Column 1 presents the coefficient estimates from a regression that accounts for students' gender and academic standing. Year fixed effects account for differences in the exchange program over the academic years, whereas campus fixed effects account for differences across the eight Sciences Po campuses. On average, students with higher grades request higher-ranked partner universities.

Yet, even after accounting for their relatively strong academic standing, on average, female students request worse-ranked exchange universities than the male students in their cohort. The difference is large in magnitude: female students request universities that rank 10.28 places—or 10.5% of the overall mean rank of 97.6—worse than their male classmates ($p < 0.01$).

To understand further the relationship between academic performance, gender, and exchange program choices, we add the interaction of gender and first-year grades in column 2. Better first-year grades are associated with requests for better-ranked exchange universities; however, female students' requests are less sensitive to their academic performance than male students' requests. The coefficient estimate on the interaction is positive and substantial, suggesting that female students' choices are approximately 30% less sensitive to academic performance than male students' choices ($p < 0.01$). Coefficient estimates are similar when we add cohort fixed effects in column 3.

Sciences Po students come from a variety of backgrounds and are admitted to the university through one of several channels. Approximately 65% of students applying for an exchange university are admitted based on their entrance exam performance, roughly 26% are admitted through a process for international students, and the remaining 9% of students were admitted under a dual degree program or an affirmative action program. We control for students' cultural and academic background with citizenship and admissions type fixed effects. Column 4 presents the most demanding specification, and the results suggest that accounting for these student characteristics affects neither the significance nor the magnitude of the coefficient estimate on students' gender. As in the previous columns of Table 5, women—even top performing ones—request schools that are lower ranked than those requested by their male peers. The coefficient estimate on gender is large in magnitude, reflecting a nearly 10-rank difference between the top choice of male and female students ($p < 0.01$). The disparity is especially pronounced among students with strong academic standing ($p = 0.03$).

Exchange universities vary in terms of the language of instruction, campus community, and local amenities. To account for the possibility that students' choices are driven primarily by the language of instruction, we limit our sample to universities in the U.S. and re-estimate the specification in column 4.²⁰ In column 5 of Table 5, we present the coefficient estimates from an analysis of

²⁰Because the majority of exchange universities in the U.S. are ranked by QS, limiting our analysis to only U.S. destinations also limits the number of universities without official QS rankings. The coverage varies slightly by year: 43 of 71, 48 of 76 and 47 of 75 U.S. were ranked in 2012, 2013, and 2014, respectively.

students' top choice of U.S. exchange universities only. Again, we find that female students ask for exchange universities that are ranked nearly 22 ranks worse than the choices of their male classmates, even after accounting for their academic standing ($p < 0.01$). In this specification, however, the interaction of the indicator for a female student and first-year grades is negative and not statistically significant ($p = 0.16$).

Finally, to assess how the incomplete ranking data affect our analysis, we re-estimated our main specifications after attributing a unique and random rank to universities that are not included in the QS official ranking (rank from 198 to 355 in 2012, 210 to 373 in 2013, and 218 to 397 in 2014).²¹ The coefficient estimates from this alternative specification, reported in column 6, are similar to our main results: relative to their male classmates, female students request lower ranked exchange destinations ($p < 0.01$), and their choices are less sensitive to their academic standing ($p = 0.02$).

The analysis in Table 5 focuses on students' first choice for an exchange destination. Although their first choice is perhaps the most important selection—67.7% of students get their top choice—we find similar results when we analyze some of the students' other choices. Table 6 re-estimates the specification in column 4 of Table 5 for students' second- through sixth-choices, respectively. On average, female students request worse-ranked universities for their second choice, compared to their male classmates; the coefficient estimate in column 1 of Table 6 suggests that, after accounting for students' academic performance, the average gap between male and female students' second choice is more than 12 ranks ($p < 0.01$). Although better-performing students ask for better-ranked universities ($p < 0.01$), the gap between male and female students' requests is especially large among high performing students ($p = 0.06$). The difference between male and female students' choice appears to taper off with subsequent requests. Whereas the average difference between male and female students' choices is roughly 6, 11, and 5 ranks for their third, fourth, and fifth choices, there is no statistical difference between male and female students' sixth choice.

Differences in the top requests by male and female students have real consequences in terms of exchange assignments: 70.2% of female students are assigned their top choice, whereas 64.4% of male students are assigned their top choice, and the difference is statistically significant ($p < 0.01$). Our results suggest that women obtain their top-choice exchange destination more often because

²¹Approximately half of the exchange universities are not ranked by QS, and many countries have few (if any) ranked exchange universities. Of the ranked exchange universities, 20% and 13% are in the U.S. and U.K., respectively.

they request worse-ranked schools. In general, better-performing students ask for better-ranked exchange universities; however, high-performing women appear especially reluctant to ask for as well-ranked an exchange destination as their male academic peers. In practice, this means that a typical (mid-ranked) exchange university receives top-choice requests from female students with relatively strong academic scores; top-choice requests from male students with relatively weak academic scores; and, if anything, back-up choices from male students with relatively high academic scores.

5.2 Risk aversion and exchange university choice

In compiling their exchange university requests, students face, to varying degrees, both competition with their peers and uncertainty around final assignments. The finding that female students request worse-ranked exchange universities—if motivated by a desire to avoid strong peer comparisons or assure their top choices—is consistent with previous findings that women are more risk-averse and avoid competition (Charness and Gneezy, 2012; Croson and Gneezy, 2009; Gneezy and Rustichini, 2004; Gneezy et al., 2003; Gupta and Rothstein, 2005; Niederle and Vesterlund, 2007).

Although we cannot identify risk aversion directly, more risk averse students may avoid requesting exchange universities where they expect a lower probability of assignment. More specifically, risk averse students may be especially unlikely to request exchange universities where there are few seats offered or where there was excess demand for exchange seats in the previous year. Table 7 presents results from regressions where the dependent variable is the number of seats offered at the students' top-choice exchange university (columns 1 and 2) or the excess demand at the exchange university, measured as the difference between the total number of assigned seats and the total number of seats offered to Sciences Po by the exchange university (columns 3 and 4). To account for the fact that better-ranked universities are both more likely to be requested by students and offer fewer seats, the specifications in columns 2 and 4 account for the university's rank directly.

We do not find evidence that women request spots at universities where there are more seats offered; if anything, the negative coefficient estimate on the indicator for female students in column 1 suggests that women are less likely to ask for a university with more seats offered ($p > 0.01$). Additionally, we find no evidence that women refrain from requesting spots at universities where

there is excess demand for seats. Students with higher first-year grades request exchange universities with fewer exchange seats offered and where there was excess demand for seats in the previous year, even after controlling for the rank of the exchange university ($p < 0.01$). Together, we find little evidence suggesting that our main finding—that female students request worse-ranked exchange universities—is driven by risk aversion.

6 Survey of students' preferences

To further examine the differences in the choices of male and female students that we document in Section 5, we surveyed a new cohort of students as they were actively thinking about their upcoming exchange year. In the 2016–17 academic year, we asked second-year students about their underlying preferences for their exchange experience and their expectations about the allocation of exchange seats.

The survey questions, included in Appendix B, focus on exchange program choices. First, we asked respondents to describe the importance of different university characteristics. The second group of questions asked about the students' ideal university; for example, which university would the students attend if they were unconstrained in the choice? To elicit information about perceived competition and risk preferences, we also asked about students' subjective expectations for the outcomes of the exchange seat assignment. Finally, to assess their confidence, we asked students about their perceptions of their own academic standing.

6.1 Survey: descriptive statistics

Students completed the survey online in early October 2016, approximately two months before the submission deadline for their exchange program choices. Among the 1,177 students who later submitted exchange program requests, the survey response rate was 52.4%.²²

Respondents are broadly representative of students in the cohort. As reported in Table 8, respondents and non-respondents are equally likely to be women and French citizens. Both male and female respondents are very slightly better students than non-respondents, with average first-year scores that are 3% higher than non-respondents ($p < 0.01$).

²²The 158 students in dual degree programs with pre-determined exchange destinations are excluded from the reported survey results.

Consistent with the findings in Section 5.1, both respondent and non-respondent female students asked for lower ranked schools than their male counterparts. The gap between male and female non-respondents is especially pronounced. Among survey respondents, the difference in the average rank of the exchange universities requested by male and female students is 5.24, and the difference is not statistically significant ($p = 0.45$); among non-respondents, the difference in the average rank of the exchange universities requested male and female students is 20.89, and the difference is statistically significant ($p < 0.01$).²³

The self-selection of survey respondents likely works *against* us finding differences in the preferences of male and female students. If anything, the fact that male and female respondents request relatively similar exchange universities, compared to non-respondents and the overall sample, makes it *less* likely that we identify differences in their underlying preferences for academic and/or non-academic exchange university criteria.

6.2 Differences in tastes for higher education

The survey elicits information about students' academic and non-academic interests. Specifically, we asked students to rate the importance of eighteen criteria on a ten-point scale. The survey did not organize the criteria for the students; however, we can organize the criteria *ex post* into categories that describe four dimensions of the exchange year experience:

- *Academic Experience*, including the academic reputation of the university, the program's fit with the student's short- and long-term professional goals, and how well it prepares the student for a selective master's program.
- *Cultural Experience*, including opportunity to discover a new culture and improve the student's language skills, as well as the ease of traveling from the location, and the general uniqueness of the opportunity.
- *Campus Life*, including the diversity of university's student population, the campus atmosphere, the appeal of studying at either a small or large university, and the student's interest

²³In the 2016–2017 data, the overall gender difference in the ranking of top-choice exchange universities choices is 13.25 ($p < 0.01$). Although the gap is similar in magnitude to that found for earlier cohorts, administrative changes at Sciences Po make it difficult to directly compare this cohort and the cohorts analysed in Section 5. For example, after 2015, more students enrolled on the Reims campus (and fewer students on the Paris campus) for their first two years of studies. Also, in February 2016, preliminary results from Section 5 were presented to Sciences Po administrators, and they may have encouraged female students to apply for better-ranked schools. Participation in the survey may also have influenced students' choices.

in specific non-academic campus activities.

- *Local Environment*, including whether the exchange university is located in a rural or urban setting, the weather conditions prevailing in the area, personal safety on campus in the local community, and the cost of living (in addition to university-related fees).

Academic-related criteria align most directly with labor-market outcomes; however, other criteria may nonetheless yield returns on the labor market—for instance, job seekers may benefit from having learned a foreign language (Sorrenti, 2017) or developed cross-cultural interpersonal skills.

Table 9 summarizes students’ responses, reporting the mean scores for each criterion for male and female students, respectively. We also report p -values for a t-test comparing the mean scores of male and female respondents and a Kolmogorov-Smirnov test of the equality of the distributions of responses.

Panel A presents the summary measures for academic criteria. On average, male and female students assigned similar scores. The mean scores and distributions of scores are statistically similar for all academic criteria (with $p = 0.23$ or higher).

Culture-related criteria, summarized in Panel B, received higher average scores than criteria related to academics, campus life or the environment, especially among female students: the mean scores of female respondents are higher than for male respondents for three of the four culture-related criteria (with $p = 0.01$ or lower), and the distribution of scores are statistically different by gender for all four criteria (with $p = 0.07$ or lower). The development of language skills is the highest scored criterion among both male and female students.

Female students also give significantly higher scores to the importance of a diverse student body ($p < 0.01$) and non-academic campus activities ($p < 0.01$), two campus-life related criteria in Panel C.

Finally, three environment-related criteria in Panel D are more important for female students than for male students: the mean score for female respondents is higher for pleasant weather ($p < 0.01$), personal safety ($p < 0.01$), and cost of living ($p = 0.01$).

The summary statistics in Table 9 suggest that male and female students differ in their preferences for exchange university characteristics; however, the summary measures cannot robustly account for students’ cultural and academic background and students’ idiosyncratic tendencies to

assign high or low scores across all categories. To account for these factors, we ask whether students assigned their highest scores to a particular criterion. In the following analysis, we consider a student to have *prioritized* a criterion if he or she assigns it a score of s and assigned no other criterion scores above s . Note that we can code students as having prioritized multiple criteria. Indeed, on average, male and female students give their highest score to 2.3 and 2.7 criteria, respectively, and the difference is statistically significant ($p < 0.01$).

In Table 10, we report results of a probit specification where the dependent variable is an indicator for whether the student prioritized, as defined above, any criteria in the category of interest, where academics, culture, campus life and environmental characteristics are presented in columns 1–4, respectively.

We find no evidence that male and female students differ in their propensity to prioritize academic criteria—the coefficient estimate on the indicator for a female respondent is negative and not statistically significant (column 1, $p = 0.12$). In contrast, female students are more likely than their male counterparts to give their highest scores to criteria relating to culture, campus life or the environment. For each of these categories, the coefficient estimate is positive and statistically significant (column 2, $p < 0.01$; column 3, $p = 0.02$; column 4, $p = 0.01$).

Consistent with a pattern of specific attention to academic achievement, students with higher first-year grades are more likely to prioritize academic criteria ($p < 0.01$) and less likely to prioritize culture, campus life and the environment (column 2, $p = 0.10$; column 3, $p = 0.06$; column 4, $p < 0.01$). The effect of average first-year grades on survey responses is not statistically different for female students except for environment-related criteria, where higher-achieving women assign more top scores than their male counterparts ($p = 0.04$).

Table 9 suggests that female students may have more diverse tastes than their male classmates, assigning importance to both academic and non-academic characteristics when compiling their exchange university requests. The final column of Table 10 addresses a complementary question: do male and female students differ in their propensity to assign top scores *exclusively* to academic criteria?²⁴ Column 5 reports coefficient estimates from a probit specification where the dependent variable is an indicator variable that is equal to one for students who gave relatively high scores

²⁴Whereas 12.6% of male students give top scores to academic criteria exclusively (and therefore give lower scores to all other criteria), only 5.9% of female students provide a similar pattern of responses. The difference is statistically significant ($p < 0.01$).

to academic criteria and relatively low scores in *all* other categories; and zero for students who assigned similar scores across academic and non-academic criteria. The coefficient estimate on the indicator for female respondents is negative statistically significant ($p < 0.01$), suggesting that female students are significantly less likely than male students to have exclusively academic priorities. In other words, male students have more focused preferences for the academic features of their ideal exchange universities than their female peers.²⁵

Overall, the survey evidence also suggests that male and female students differ in terms of the breadth of their considerations in the face of multiple exchange university characteristics. Although male students—especially those with strong academic standing—focus primarily on the academic characteristics of exchange destinations, survey responses suggest that female students consider both academic *and* non-academic characteristics when choosing exchange universities.

The students submitted their exchange program requests about two months after completing the survey. As such, we were able to assess whether their survey responses were consistent with their actual requests—that is, whether the preferences that we inferred from their survey scoring were revealed in their actual choices. Reassuringly, assigning high scores to academic criteria is associated with requesting better-ranked exchanged universities.²⁶

6.3 Differences in risk-taking and confidence

The survey included an open-format comments section and, although it is difficult to generalize from individual open-ended text, the unstructured responses do give us insight into students' decision-making. One high-performing female student's comment summarizes our finding that women have more diverse preferences: "Male students may ask more for competitive American universities, but what are the interest or later consequences of this, compared to the interest of spending a year in a wholly different cultural, linguistic, natural, social environment? This has

²⁵We draw similar conclusions from ordered logit regressions, where the dependent variable is the score assigned to the criterion and the specification includes the same variables as those in the regressions in Table 10. Specifically, although the importance of academic criteria is increasing in students' first-year grades, there is little evidence that female students assign systematically different scores to these criteria. However, relative to their male counterparts, female students are more likely to assign high scores to nearly all of the cultural, campus, and environmental criteria.

²⁶In an unreported regression, we expanded the specification in column 4 of Table 5 to include an indicator for whether the student assigned his or her top score exclusively to academic criteria and estimated the regression using the sample of surveyed students. The coefficient estimate on the indicator for having prioritized academic criteria is relatively large, negative and statistically significant ($p < 0.01$).

my preference.”²⁷ The same student reports her concern about the air quality in what would have otherwise been a preferred exchange university location.²⁸

Examining exchange university requests in Section 5, we find little evidence that female students’ worse-ranked exchange requests are driven by gender differences in risk aversion—female students were not more likely to request exchange universities with more open seats, nor were they avoiding exchange universities with excess demand for seats. The survey allows us to again consider risk aversion, as we elicited students’ perceptions of probable exchange program outcomes and students’ own academic standing at Sciences Po.²⁹

Most relevant for assessing risk aversion in exchange university requests, we asked “If you knew that you had a $x\%$ chance of obtaining your ideal university as a 1st choice, would you ask for it?” with x equal to 20%, 40%, 60% and 80%, respectively. We find no statistical difference in the responses of male and female students. We also find no statistical difference in male and female students’ propensity to correctly over- or under-estimate their academic score. Although, on average, women have been shown to be more risk-averse, less competitive, less confident, and less likely to ask for resources in many educational and labor markets contexts (Babcock and Laschever, 2009; Barber and Odean, 2001; Bengtsson et al., 2005; Bertrand et al., 2010; Buser et al., 2014; Croson and Gneezy, 2009; Niederle and Vesterlund, 2007; Vandegrift and Brown, 2005; Reuben et al., 2017; van Veldhuizen, 2017), we find very little evidence of differences in confidence or risk-taking between male and female students in our setting.³⁰

²⁷This student provided a response in English; her comment is reported verbatim.

²⁸There are other explanations consistent with the observed gender differences. For example, another female student wrote: “I don’t want to dream about something and not to have it,” suggesting both regret (Zeelenberg et al., 1996) and loss aversion (Gächter et al., 2007). Not asking for a top choice could be a strategy to avoid a negative self-perception, and female students’ choices could reflect feedback aversion or self-esteem protection. Behaviors would be observationally similar to, for example, risk aversion, and disentangling these explanations is not central to the current study.

²⁹Summary measures from the survey questions relating to expectations are reported in Appendix Table A4.

³⁰Existing literature highlights other mechanisms consistent with our finding that women request lower ranked exchange universities than their male peers, including evidence that women “act nice” to conform to gender-stereotypical expectations (Rudman and Glick, 2001) and shape their behavior to enhance their prospects on the marriage market (Bursztyn et al., 2017). Formal tests of these explanations are beyond the scope of the current study and are left for future research.

7 Simulation

Our survey evidence suggests that differences in male and female students' requests for exchange universities are related to differing tastes for higher educational experiences. Although the long-term consequences play out in the labor market, there are also short-term consequences of these differing preferences and choices.

To understand the impact of female students' preferences on the overall allocation of exchange seats, we simulate exchange program assignments if Sciences Po assigned students solely according to exchange university ranking and the students' academic standing. In the simulation, we assign students to the highest ranked universities according to their rank-order, breaking ties randomly.

On average, the simulation changes the ranking of exchange universities assigned to both male and female students; however, the difference between the ranking of an average female student's actual and simulated exchange university is 25 ranks, whereas the difference is only 13 ranks for an average male student.

Figure 4 plots the difference between the rankings of the exchange universities assigned by the simulation and students' actual exchange assignments against students' average first-year grades. Although both high-achieving male and female students obtain better-ranked schools in the simulation, the gains from the new allocation mechanism are especially pronounced for high-achieving female students.

Examining actual choices in Section 5, we find that female students request worse-rank exchange universities than their male peers, and the difference is especially pronounced among high-achieving students (Table 5). As a result, lower-achieving male students are able to secure seats at better-ranked exchange universities. By assigning students solely according to their academic standing, the simulation affects both male and female students' exchange outcomes. The effect on female students is straightforward: female students are almost mechanically assigned to better-ranked exchange universities.

The effect for male students is more nuanced: First, the simulation shifts some high-performing male students into unfilled seats at high-ranked universities. Second, by assigning female students to seats at better-ranked schools that would have otherwise gone to lower-performing male students, the placement of many male students with *average* grades improves because they no longer compete

with the top-performing female students for high-ranked exchange universities.

The simulation exercise is not intended to motivate policy. Female students' requests for universities, even if those universities are worse-ranked academically (Table 4) than those chosen by their male peers, may align with female students' diverse preferences for academic and non-academic experiences (Table 10), and our analysis offers no guidance in intervening with that match. Instead, the simple simulation exercise suggests that female students' preferences for academic and non-academic exchange characteristics have mixed short-term consequences for their male classmates. Male students with strong academic scores benefit from the lack of competition, as their high-achieving female peers turn to other exchange opportunities. However, the male students whose top-choice would be those alternative exchange universities must now face competition from these high-achieving female classmates.

8 Conclusion

The heterogeneity in educational choices that we described in this paper is likely to have long-term consequences for men and women's labor market outcomes, including job offers, career paths, and earnings (Freier et al., 2015; Hoekstra, 2009; MacLeod et al., 2017; Zimmerman, 2014; Dale and Krueger, 2014). Whereas labor demand-side factors, such as employer discrimination, may continue to contribute to the gap in early labor-market outcomes, our results suggest that supply-side factors related to human capital development in higher education may also shape outcomes. Because so many student choices are masked in higher educational data by coarse descriptions of educational attainment, degree titles, or even program names, careful study of these supply-side factors remains challenging.

Our data of *within* program choices are uniquely detailed, and our results indeed suggest that male and female students make different choices within a course of study. And these differences in choices are likely to matter. We extend the literature that highlights the shrinking role of traditional measures of human capital—mainly gender differences in educational attainment and years of experience, both of which have narrowed substantially in recent decades in explaining the persistent gender pay gap (Kleven et al., 2019; Meurs and Pora, 2019; Goldin, 2014; Blau and Kahn, 2017; Altonji and Blank, 1999). The shrinking explanatory power of the traditional

measures of human capital may reflect changes in men and women's choices within workplace and educational settings; for example, they may pursue different resume-building opportunities in and out of the classroom. Gender differences in course choices and skills developed within a same academic program or field of study (Bertrand et al., 2010; Hamermesh and Donald, 2008), choices for internships (Kessler et al., 2019) or, as we study in this paper, choices for study abroad programs, are generally not taken into account by studies measuring gender differences in labor market outcomes. Accounting for these different choices suggest a persistent role of human capital in explaining the gender pay gap on the labor market.

References

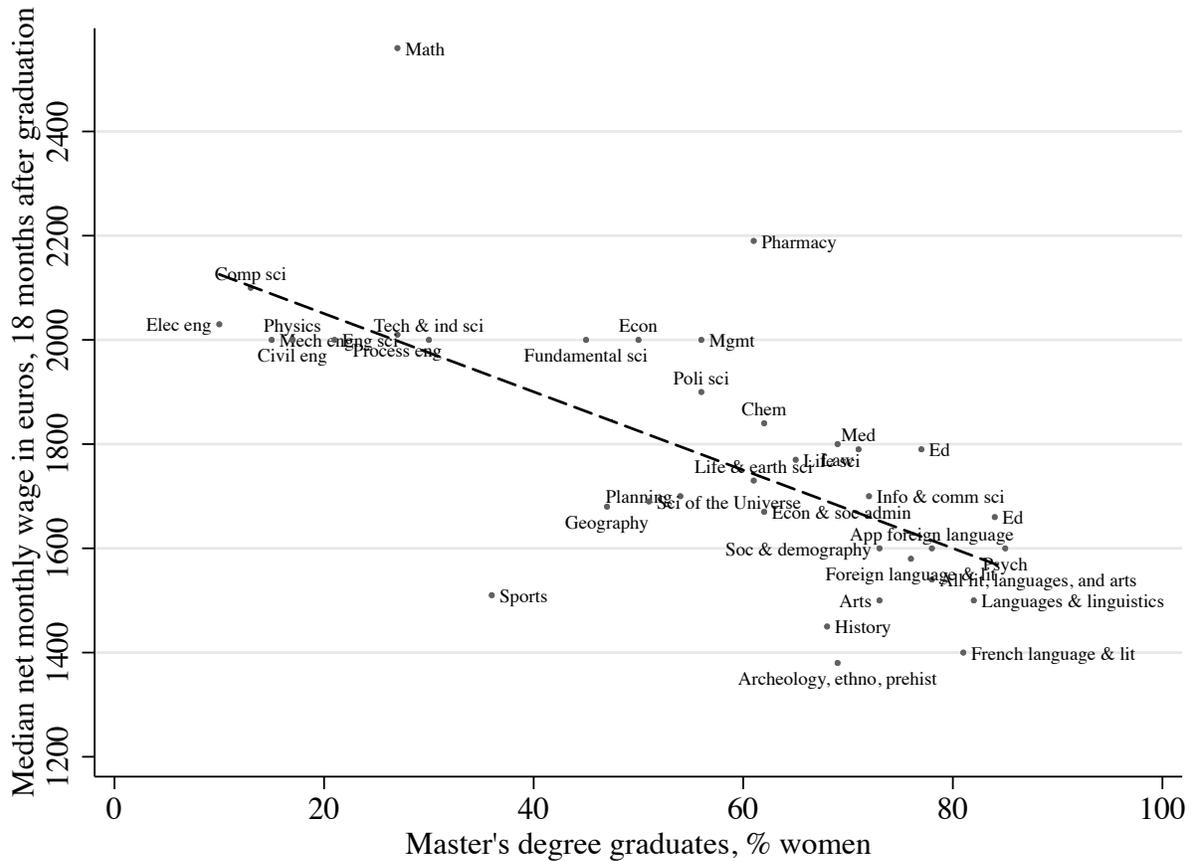
- Abdulkadiroğlu, A., Pathak, P. A., Roth, A. E., and Sönmez, T. (2005). The Boston public school match. *American Economic Review*, 95(2):368–371.
- Abdulkadiroğlu, A. and Sönmez, T. (2003). School choice: A mechanism design approach. *American Economic Review*, 93(3):729–747.
- Aguillo, I., Bar-Ilan, J., Levene, M., and Ortega, J. (2010). Comparing university rankings. *Scientometrics*, 85(1):243–256.
- Altonji, J. G., Arcidiacono, P., and Maurel, A. (2016). The analysis of field choice in college and graduate school: Determinants and wage effects. In *Handbook of the Economics of Education*, volume 5, pages 305–396.
- Altonji, J. G. and Blank, R. M. (1999). Race and gender in the labor market. *Handbook of Labor Economics*, 3:3143–3259.
- Altonji, J. G. and Pierret, C. R. (2001). Employer learning and statistical discrimination. *The Quarterly Journal of Economics*, 116(1):313–350.
- Azmat, G., Hensvik, L., and Rosenqvist, O. (2020). Workplace presenteeism, job substitutability and gender inequality.
- Babcock, L. and Laschever, S. (2009). *Women don't ask: Negotiation and the gender divide*. Princeton University Press.
- Barber, B. M. and Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *The Quarterly Journal of Economics*, 116(1):261–292.
- Behrman, J. R., Rosenzweig, M. R., and Taubman, P. (1996). College choice and wages: Estimates using data on female twins. *The Review of Economics and Statistics*, pages 672–685.
- Bengtsson, C., Persson, M., and Willenhag, P. (2005). Gender and overconfidence. *Economics Letters*, 86(2):199–203.
- Bertrand, M., Goldin, C., and Katz, L. F. (2010). Dynamics of the gender gap for young professionals in the financial and corporate sectors. *American Economic Journal: Applied Economics*, 2(3):228–55.
- Black, D. A. and Smith, J. A. (2004). How robust is the evidence on the effects of college quality? Evidence from matching. *Journal of Econometrics*, 121(1-2):99–124.
- Black, D. A. and Smith, J. A. (2006). Estimating the returns to college quality with multiple proxies for quality. *Journal of Labor Economics*, 24(3):701–728.
- Blau, F. D. and Kahn, L. M. (2017). The gender wage gap: Extent, trends, and explanations. *Journal of Economic Literature*, 55(3):789–865.
- Boring, A. (2017). Au travail, les inégalités entre hommes et femmes apparaissent dès après l’université. *Le Monde*. <https://www.lemonde.fr/idees/article/2017/05/11/au-travail-les-inegalites-entre-hommes-et-femmes-apparaissent-des-apres-l-universite>.
- Brewer, D. J., Eide, E. R., and Ehrenberg, R. G. (1999). Does it pay to attend an elite private college? *The Journal of Human Resources*, 34(1):104–123.

- Bursztyn, L., Fujiwara, T., and Pallais, A. (2017). ‘Acting wife’: Marriage market incentives and labor market investments. *American Economic Review*, 107(11):3288–3319.
- Buser, T., Niederle, M., and Oosterbeek, H. (2014). Gender, competitiveness, and career choices. *The Quarterly Journal of Economics*, 129(3):1409–1447.
- Buser, T., Peter, N., and Wolter, S. C. (2017). Gender, competitiveness, and study choices in high school: Evidence from Switzerland. *American Economic Review*, 107(5):125–30.
- Charness, G. and Gneezy, U. (2012). Strong evidence for gender differences in risk taking. *Journal of Economic Behavior & Organization*, 83(1):50–58.
- Corbett, C. and Hill, C. (2012). *Graduating to a Pay Gap: The Earnings of Women and Men One Year after College Graduation*. ERIC.
- Crosen, R. and Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, 47(2):448–74.
- Dale, S. B. and Krueger, A. B. (2014). Estimating the effects of college characteristics over the career using administrative earnings data. *Journal of Human Resources*, 49(2):323–358.
- Daymont, T. N. and Andrisani, P. J. (1984). Job preferences, college major, and the gender gap in earnings. *The Journal of Human Resources*, pages 408–428.
- Di Pietro, G. (2019). University study abroad and graduates’ employability. *IZA World of Labor*.
- Erb, L. A. (2016). Les inégalités femmes/hommes dans l’insertion professionnelle des diplômés de master.
- Erb, L. A. (2018). Disciplines du diplôme de master et insertion professionnelle selon le genre. In *Éducation formations, L’égalité entre les filles et les garçons, entre les femmes et les hommes, dans le système éducatif*, volume 3, pages 85–111.
- Ergin, H. and Sönmez, T. (2006). Games of school choice under the Boston mechanism. *Journal of Public Economics*, 90(1-2):215–237.
- Fitzgerald, R. A. (2000). *College quality and the earnings of recent college graduates*. US Department of Education, Office of Educational Research and Improvement.
- Freier, R., Schumann, M., and Siedler, T. (2015). The earnings returns to graduating with honors—Evidence from law graduates. *Labour Economics*, 34:39–50.
- Gächter, S., Johnson, E. J., and Herrmann, A. (2007). Individual-level loss aversion in riskless and risky choices.
- Gneezy, U., Niederle, M., and Rustichini, A. (2003). Performance in competitive environments: Gender differences. *The Quarterly Journal of Economics*, 118(3):1049–1074.
- Gneezy, U. and Rustichini, A. (2004). Gender and competition at a young age. *American Economic Review*, 94(2):377–381.
- Goldin, C. (2014). A grand gender convergence: Its last chapter. *American Economic Review*, 104(4):1091–1119.

- Goldin, C., Katz, L. F., and Kuziemko, I. (2006). The homecoming of american college women: The reversal of the college gender gap. *Journal of Economic Perspectives*, 20(4):133–156.
- Gupta, N. D. and Rothstein, D. S. (2005). The impact of worker and establishment-level characteristics on male–female wage differentials: Evidence from Danish matched employee–employer data. *Labour*, 19(1):1–34.
- Hamermesh, D. S. and Donald, S. G. (2008). The effect of college curriculum on earnings: An affinity identifier for non-ignorable non-response bias. *Journal of Econometrics*, 144(2):479–491.
- Hershbein, B. (2013). Worker signals among new college graduates: The role of selectivity and GPA.
- Hoekstra, M. (2009). The effect of attending the flagship state university on earnings: A discontinuity-based approach. *The Review of Economics and Statistics*, 91(4):717–724.
- Joy, L. (2003). Salaries of recent male and female college graduates: Educational and labor market effects. *ILR Review*, 56(4):606–621.
- Kessler, J. B., Low, C., and Sullivan, C. D. (2019). Incentivized resume rating: Eliciting employer preferences without deception. *American Economic Review*, 109(11):3713–44.
- Kleven, H., Landais, C., and Sørensen, J. E. (2019). Children and gender inequality: Evidence from Denmark. *American Economic Journal: Applied Economics*, 11(4):181–209.
- Knouse, S. B. (1994). Impressions of the resume: The effects of applicant education, experience, and impression management. *Journal of Business and Psychology*, 9(1):33–45.
- Le Barbanchon, T., Rathelot, R., and Roulet, A. (2019). Gender differences in job search: Trading off commute against wage. *Available at SSRN 3467750*.
- MacLeod, W. B., Riehl, E., Saavedra, J. E., and Urquiola, M. (2017). The big sort: College reputation and labor market outcomes. *American Economic Journal: Applied Economics*, 9(3):223–61.
- McCabe, K. O., Lubinski, D., and Benbow, C. P. (2019). Who shines most among the brightest?: A 25-year longitudinal study of elite stem graduate students. *Journal of Personality and Social Psychology*.
- Meurs, D. and Pora, P. (2019). Égalité professionnelle entre les femmes et les hommes en France: une lente convergence freinée par les maternités. *Economie et Statistique/Economics and Statistics*, 510:109–130.
- Monks, J. (2000). The returns to individual and college characteristics: Evidence from the national longitudinal survey of youth. *Economics of Education Review*, 19(3):279–289.
- Niederle, M. and Vesterlund, L. (2007). Do women shy away from competition? Do men compete too much? *The Quarterly Journal of Economics*, 122(3):1067–1101.
- OECD (2015). The ABC of gender equality in education: Aptitude, behaviour, confidence.
- Oliphant, V. N. and Alexander III, E. R. (1982). Reactions to resumes as a function of resume determinateness, applicant characteristics, and sex of raters. *Personnel Psychology*, 35(4):829–842.

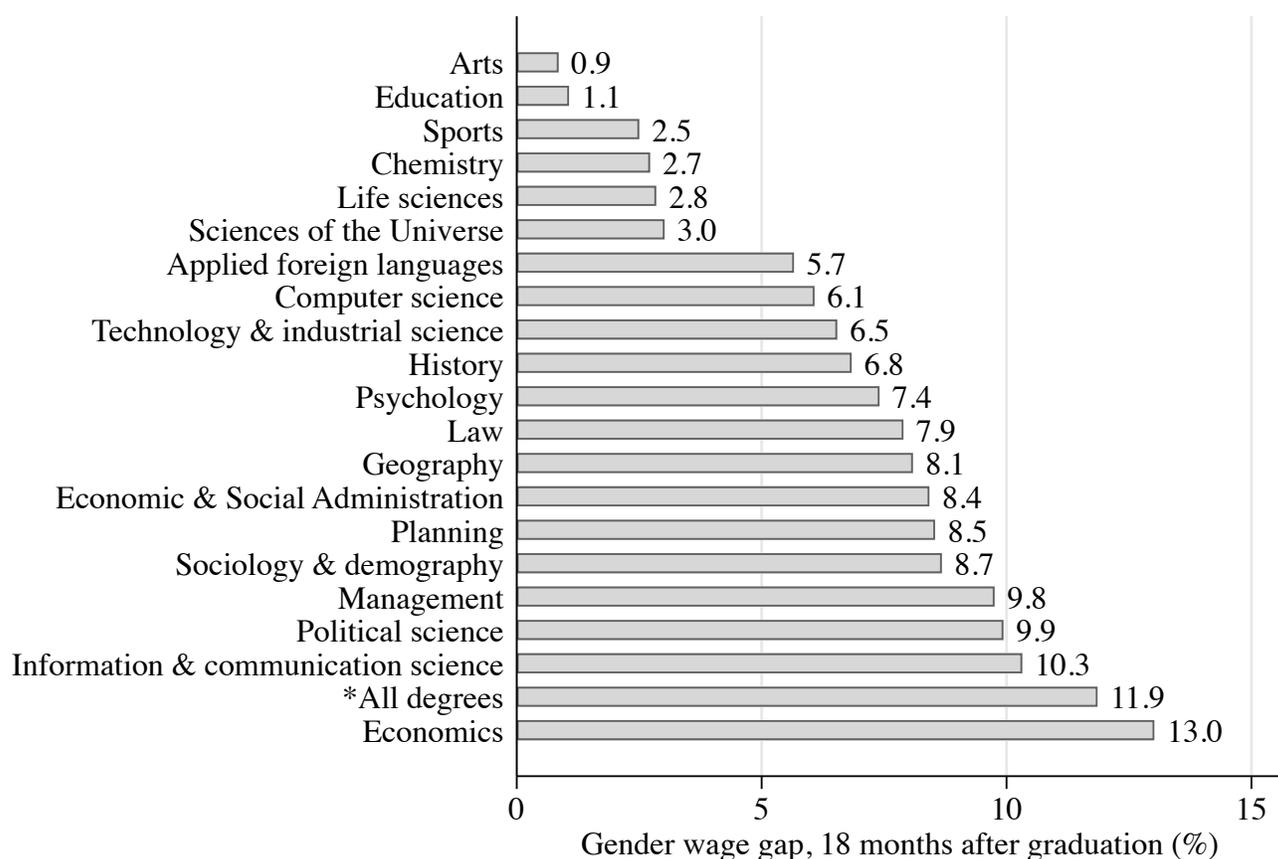
- Pathak, P. A. and Sönmez, T. (2008). Leveling the playing field: Sincere and sophisticated players in the Boston mechanism. *American Economic Review*, 98(4):1636–52.
- Petrongolo, B. and Ronchi, M. (2020). Gender gaps and the structure of local labor markets. *Labour Economics*, page 101819.
- Reuben, E., Wiswall, M., and Zafar, B. (2017). Preferences and biases in educational choices and labour market expectations: Shrinking the black box of gender. *The Economic Journal*, 127(604):2153–2186.
- Rudman, L. A. and Glick, P. (2001). Prescriptive gender stereotypes and backlash toward agentic women. *Journal of Social Issues*, 57(4):743–762.
- Sorrenti, G. (2017). The Spanish or the German apartment? Study abroad and the acquisition of permanent skills. *Economics of Education Review*, 60:142–158.
- Spence, M. (1978). Job market signaling. In *Uncertainty in Economics*, pages 281–306. Elsevier.
- Thoms, P., McMasters, R., Roberts, M. R., and Dombkowski, D. A. (1999). Resume characteristics as predictors of an invitation to interview. *Journal of Business and Psychology*, 13(3):339–356.
- Thornton, R. J., McDonald, J. A., et al. (2015). The gender gap in starting salaries for new college graduates. *Gender in the Labor Market – Research in Labor Economics*, 42:205–229.
- Turner, S. E. and Bowen, W. G. (1999). Choice of major: The changing (unchanging) gender gap. *ILR Review*, 52(2):289–313.
- van Veldhuizen, R. (2017). Gender differences in tournament choices: Risk preferences, overconfidence or competitiveness? Technical report, Discussion Paper.
- Vandegrift, D. and Brown, P. (2005). Gender differences in the use of high-variance strategies in tournament competition. *The Journal of Socio-Economics*, 34(6):834–849.
- Weiss, A. (1995). Human capital vs. signalling explanations of wages. *Journal of Economic perspectives*, 9(4):133–154.
- Wiswall, M. and Zafar, B. (2018). Preference for the workplace, investment in human capital, and gender. *The Quarterly Journal of Economics*, 133(1):457–507.
- Zafar, B. (2013). College major choice and the gender gap. *Journal of Human Resources*, 48(3):545–595.
- Zeelenberg, M., Beattie, J., Van der Pligt, J., and De Vries, N. K. (1996). Consequences of regret aversion: Effects of expected feedback on risky decision making. *Organizational Behavior and Human Decision Processes*, 65(2):148–158.
- Zhang, L. (2005). Do measures of college quality matter? The effect of college quality on graduates’ earnings. *The Review of Higher Education*, 28(4):571–596.
- Zimmerman, S. D. (2014). The returns to college admission for academically marginal students. *Journal of Labor Economics*, 32(4):711–754.

Figure 1. Starting salaries and the percent of women within graduate degrees



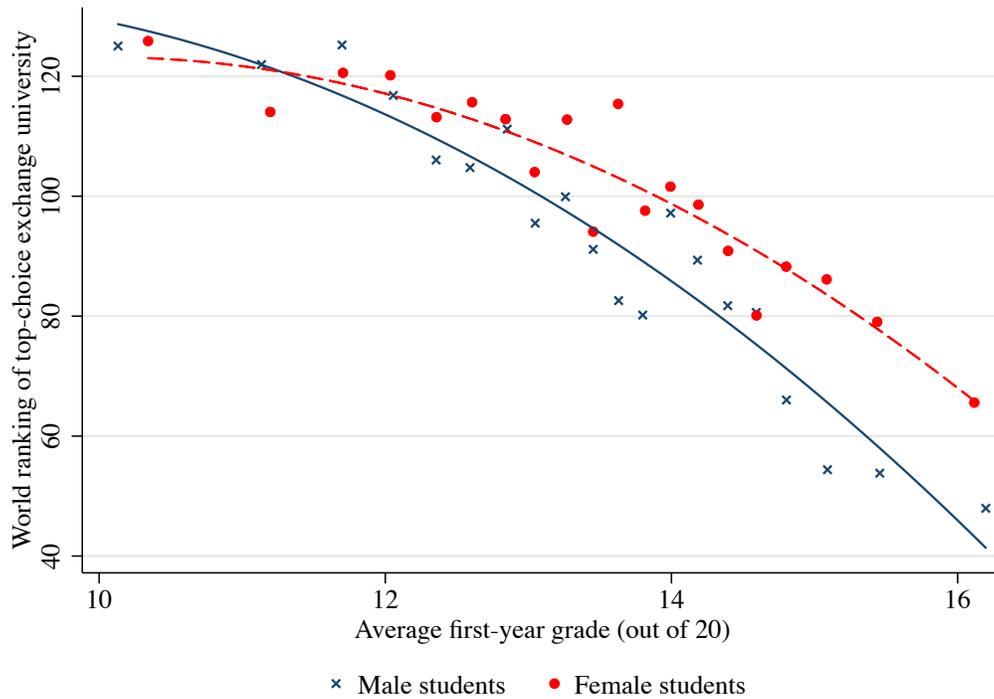
This figure plots the median net monthly wage in euros 18 months after graduation by the percent of Master's degree graduates in the field who are women. Conducted on the cohort that graduated in 2016, the survey includes the responses of 29,845 Master's degree graduates from public universities in France. The dotted line represents the fitted values of a linear regression. Data are available at: https://data.enseignementsup-recherche.gouv.fr/explore/dataset/fr-esr-insertion_professionnelle-master_donnees_nationales/information/.

Figure 2. The gender starting-salary gap and field of Master’s degree



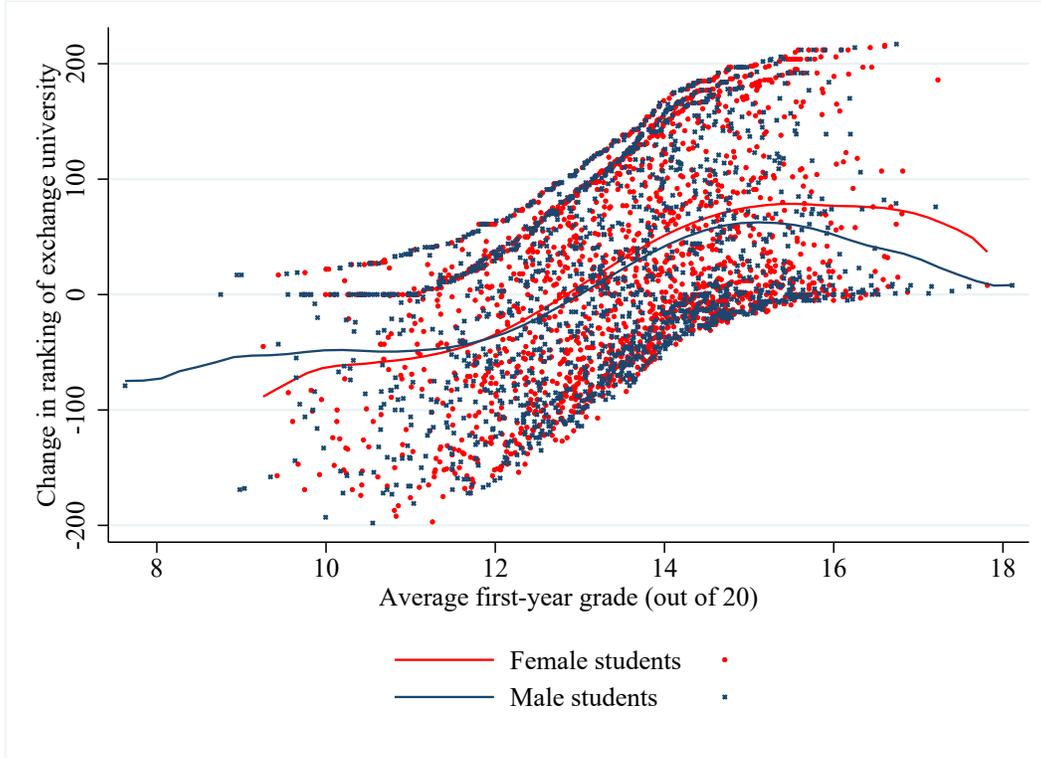
Calculations are based on the salaries of male and female workers who graduated with a Master’s degree in 2016, 18 months prior to the survey. The gender wage gap is calculated as the difference in men’s and women’s median wage divided by the median wage earned by men, by field of study, as reported by the French Ministry of Higher Education. We exclude all fields for which fewer than 80 observations of either gender are reported. Data are available at: https://data.enseignementsup-recherche.gouv.fr/explore/dataset/fr-esr-insertion_professionnelle-master_donnees_nationales/information/.

Figure 3. Student grades, the world ranking of their top-choice of exchange university, and gender



This figure presents binned scatterplots of male and female students' average first-year grades and the QS world ranking of their top-choice for exchange university for Sciences Po students who participated in the exchange program in 2012–13, 2013–14 and 2014–15. The blue x's represent male students, whereas the red circles represent female students. The blue and red lines plot the exchange university rankings as quadratic functions of the male and female students' first year grades, respectively.

Figure 4. Simulation: Actual vs. simulated exchange university assignment



We simulate exchange program assignments for Sciences Po students who participated in the exchange program in 2012–13, 2013–14 and 2014–15, assigning them to exchange universities solely according to exchange university rankings and students’ academic standing by year. We assigned students to the highest ranked universities according to their rank-order, breaking ties randomly. Each observation in the figure—red circles for female students and blue x’s for male students—shows the difference between the ranking of the exchange university obtained in reality and exchange university assigned by the simulation. A positive (negative) value on the vertical axis means the students’ simulated assignment was better-ranked (worse-ranked) than their actual assignment.

Table 1. Employment outcomes by master’s degree program, 18 months after 2016 graduation from a public university in France.

Field of Study	Median Monthly Wages (Net €)	% Full Time Jobs	% Stable Jobs	% Management Positions	% Women within Master’s Degree
<i>Panel A: Lowest Paying Fields</i>					
Archaeology, ethnology, prehistory	1,380	78	34	28	69
French languages and literature	1,400	73	50	34	81
History	1,450	78	31	32	68
Arts	1,500	73	46	35	73
Language sciences, linguistics	1,500	76	53	61	82
Sports	1,510	83	69	36	36
Foreign languages & literature	1,580	81	61	45	76
Sociology, demography	1,600	84	38	39	73
Psychology	1,600	62	47	79	85
Applied foreign languages	1,600	95	62	33	78
<i>Panel B: Highest Paying Fields</i>					
Physics	2,000	97	71	83	17
Management	2,000	98	75	61	56
Economics	2,000	97	67	61	50
Engineering sciences	2,000	99	80	82	21
Fundamental sciences	2,000	98	67	77	45
Civil engineering	2,000	99	86	80	17
Process engineering	2,010	100	75	74	27
Electrical engineering	2,030	99	88	92	10
Computer science	2,100	99	92	93	13
Pharmacy	2,190	96	56	76	61
Mathematics	2,560	98	87	95	27

This table summarizes labor market outcomes for workers 18 months after their 2016 graduations from a public university in France. Panel A and B include the lowest and highest paying fields, respectively, by median monthly wages. Data are available from OpenData, Ministère enseignement supérieur et de la recherche, 2020, accessible online: <https://data.enseignementsup-recherche.gouv.fr/>

Table 2. Summary statistics: Second-year students, by campus and academic year.

	# of students	% female	% French citizens	Average 1st-year grade		
				Male	Female	t-test of diff. p -value
<i>Panel A: International Exchange Program</i>						
All campuses, years	3,401	57	72	13.34	13.52	<0.01
<i>Panel B: Exchange participants by campus, geographic theme (2012–2015)</i>						
Paris	2,142	54	90	13.10	13.30	<0.01
Paris, Africa	37	68	30	12.90	13.31	0.53
Le Havre, Asia	197	59	52	13.75	14.05	0.12
Dijon, Eastern Europe	152	66	39	13.27	13.38	0.60
Nancy, Germany	271	59	40	14.61	14.41	0.24
Poitiers, Latin America	211	62	40	13.16	13.63	0.15
Menton, Mediterranean	142	56	25	14.13	13.61	0.02
Reims, North America	249	61	52	13.69	13.80	0.54
<i>Panel C: Exchange participants by academic year (all campuses)</i>						
2012–13	1,094	58	74	13.18	13.38	0.02
2013–14	1,178	57	73	13.49	13.53	0.62
2014–15	1,129	55	69	13.33	13.64	<0.01
<i>Panel D: Internship Program (all campuses, years)</i>						
All campuses, years	674	58	74	12.32	12.53	0.13

Panels A–C report summary statistics for the Sciences Po students who participated in the exchange program in 2012–13, 2013–14 and 2014–15, excluding 29 students who failed to submit a first choice for the exchange program, 24 students who did not submit choices because they were enrolled in a dual degree with a French university and chose to study abroad through the other university’s exchange program, and 2 students for whom first-year grades are missing. Panel D reports summary statistics for the Sciences Po students who chose to complete an internship in 2012–13, 2013–14 and 2014–15. First-year grades are not available for three students who completed internships. The French citizenship variable does not include dual citizens.

Table 3. Exchange universities by region

Region	% of available seats	Top-choice (%)		χ^2 test of indep. p -value
		Male	Female	
Africa	3.32	1.63	1.66	0.95
Asia - Eastern	7.75	9.21	9.91	0.51
Asia - South	1.67	1.42	1.92	0.27
Asia - Southeast	1.65	2.91	3.32	0.51
Australia & New Zealand	5.27	5.69	6.54	0.32
Canada	9.66	8.67	8.15	0.57
Europe - Eastern	5.44	3.66	2.85	0.18
Europe - Northern	3.19	2.78	2.54	0.66
Europe - Southern	5.94	3.39	3.94	0.40
Europe - Western	11.39	8.06	8.51	0.39
Latin America	10.17	7.59	10.74	<0.01
Middle East	7.18	6.64	5.66	0.23
UK & Ireland	10.89	12.87	13.75	0.48
USA	16.50	25.47	20.50	<0.01

Seat availability by region was calculated from data on the 355, 374 and 397 exchange universities that participated in 2012–13, 2013–14 and 2014–15. A test of equality of the top choices for male and female students by region yields a Pearson $\chi^2(13)$ of 25.91 ($p = 0.02$).

Table 4. World ranking of exchange universities by student gender and numbered request

Choice	Male students		Female students		t-test of diff. p -value	K-S test p -value
	Mean	Std. dev.	Mean	Std. dev.		
1st	92.8	2.1	101.3	1.8	<0.01	<0.01
2nd	106.8	2.0	116.9	1.7	<0.01	<0.01
3rd	121.8	1.9	125.4	1.7	0.17	0.10
4th	126.4	1.9	136.2	1.6	<0.01	<0.01
5th	132.8	1.8	136.5	1.6	0.12	0.16
6th	140.9	1.7	143.5	1.5	0.25	0.43

The sample includes all students for whom any choice data are available; the total number of observations used to calculate the mean and standard deviation varies by row (for 1st choice, $N = 3,401$; 2nd choice, $N = 3,377$; 3rd choice, $N = 3,366$; 4th choice, $N = 3,373$; 5th choice, $N = 3,364$; and 6th choice, $N = 3,360$). The first p -value is from a two-sided t-test of the difference between male and female students' mean rankings. The second p -value is from a Kolmogorov-Smirnov (K-S) test for the equality of the distribution of rankings. University rankings come from the QS World Rankings from year in which the students submitted their exchange requests.

Table 5. Students' top-choice of exchange university

Dependent variable: <i>World ranking of students' top-choice exchange university</i>	All exchange universities				U.S. only	Unique rank
	(1)	(2)	(3)	(4)	(5)	(6)
	Female student	10.28*** (2.61)	9.40*** (2.66)	9.72*** (2.82)	10.21*** (2.82)	21.65*** (6.24)
Average 1st year grade	-13.77*** (0.93)	-16.39*** (1.13)	-15.73*** (1.24)	-16.00*** (1.26)	-20.23*** (2.55)	-20.71*** (1.78)
Female \times Average 1st year grade		4.82*** (1.64)	4.05** (1.70)	3.55** (1.67)	-5.03 (3.53)	5.81** (2.45)
<i>Fixed effects</i>						
Campus	X	X				
Year	X	X				
Cohort			X	X	X	X
Citizenship				X	X	X
Admissions type				X	X	X
Adjusted R^2	0.09	0.10	0.11	0.14	0.19	0.12
No. of observations	3,401	3,401	3,401	3,401	749	3,401

This table summarizes results from regressions of the world ranking of a student's top-choice exchange university on the student's gender, average first year grades and, in columns 2–6, their interaction. Where indicated, regressions include fixed effects for the students' campus, academic year, cohort, citizenship and admissions type. The sample includes only students who participated in the exchange in 2012–13, 2013–14 and 2014–15. Exchange university ranking is the QS World University Rankings for Social Sciences and Management for the year in which the student submits his or her choices. Average grade is demeaned with respect to its sample mean before it is interacted with the indicator for female students. The specification in column 5 restricts the sample to students whose top-choice exchange university is located in the United States. In columns 1–5, all unranked universities are assigned the worst rank; in column 6, unranked universities are assigned (without gaps) a unique and random rank below the worst-ranked university. Standard errors, adjusted for clustering at the cohort level, are reported in parentheses. ** and *** indicate statistical significance at the 5% and 1% level, respectively.

Table 6. Students' second- to sixth-choice of exchange university

Dependent variable: <i>World ranking of exchange university</i>					
	2nd choice	3rd choice	4th choice	5th choice	6th choice
	(1)	(2)	(3)	(4)	(5)
Female student	12.53*** (2.66)	5.88** (2.68)	10.92*** (2.60)	4.93** (2.47)	4.04* (2.37)
Average 1st year grade	-12.80*** (1.40)	-7.77*** (1.19)	-5.51*** (1.43)	-4.23*** (1.34)	-2.39* (1.37)
Female \times Average 1st year grade	3.46* (1.83)	0.61 (1.56)	1.03 (1.76)	2.43 (1.89)	1.09 (1.69)
<i>Fixed effects</i>					
Cohort	X	X	X	X	X
Citizenship	X	X	X	X	X
Admissions type	X	X	X	X	X
Adjusted R^2	0.11	0.09	0.08	0.08	0.07
No. of observations	3,377	3,366	3,373	3,364	3,360

This table summarizes results from regressions of the world ranking of a student's second- to sixth-choice exchange university on the student's gender, average first year grades, and their interaction. Regressions include fixed effects for the student's cohort, citizenship and admissions type. The sample includes only students who participated in the exchange in 2012–13, 2013–14 and 2014–15. Sample size varies across columns because 251 students submitted fewer than six choices; students who submitted a k^{th} -choice were included, regardless of the completeness of their other choices. Exchange university rank is the QS World University Rankings for Social Sciences and Management for the year in which the student submits his or her choices. Average grade is demeaned with respect to its sample mean before it is interacted with the indicator for female students. Standard errors, adjusted for clustering at the cohort level, are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table 7. Exchange seats offered and excess demand for top-choice university

Dependent variable:	# seats offered this year		Excess demand for seats	
	(1)	(2)	(3)	(4)
Female student	-1.03*** (0.33)	-0.50 (0.31)	0.07 (0.20)	0.16 (0.20)
Average 1st year grade	0.24 (0.19)	-0.57*** (0.17)	0.71*** (0.11)	0.56*** (0.11)
Female \times Average 1st year grade	-0.09 (0.21)	0.09 (0.20)	0.08 (0.13)	0.12 (0.13)
World ranking of top-choice university		-0.05*** (0.00)		-0.01*** (0.00)
<i>Fixed effects</i>				
Cohort	X	X	X	X
Citizenship	X	X	X	X
Admissions type	X	X	X	X
Adjusted R^2	0.03	0.16	0.06	0.07
No. of observations	3,388	3,388	3,388	3,388

This table summarizes results from regressions of the number of seats offered to Sciences Po by a student's top-choice exchange university (columns 1 and 2) or the excess demand at a student's top-choice exchange university (columns 2 and 3) on the student's gender, average first year grades, and their interaction and, in columns 2 and 4, the rank of the student's top-choice university. Excess demand is measured as the total assigned seats minus the total available seats. The regressions include cohort, citizenship and admissions type fixed effects. The sample includes only students who participated in the exchange in 2012–13, 2013–14 and 2014–15. Exchange university rank is the QS World University Rankings for Social Sciences and Management for the year in which the student submits his or her choices. Average grade is demeaned with respect to its sample mean before it is interacted with the indicator for female students. Standard errors, adjusted for clustering at the cohort level, are reported in parentheses. *** indicates statistical significance at the 1% level.

Table 8. Survey respondents and non-respondents

	Respondents	Non-respondents	<i>t</i> -test of difference (<i>p</i> -value)
Total # of observations	617	560	
# male students	247	231	
# female students	370	329	
<i>Student characteristics</i>			
Average 1st year grade, all	13.92	13.55	<0.01
Average 1st year grade, male	13.91	13.51	<0.01
Average 1st year grade, female	13.93	13.58	<0.01
French citizenship (%)	68	67	0.73
<i>Post-survey exchange program requests</i>			
World ranking of top-choice exchange university, all	105.70	107.83	0.67
World ranking of top-choice exchange university, male	102.56	95.56	0.35
World ranking of top-choice exchange university, female	107.80	116.45	0.18

This table compares respondents and non-respondents to a 2016–17 academic year survey of second-year Sciences Po students. The sample excludes students in a dual degree with a foreign university, as well as students who completed an internship. Survey questions are available in Appendix B. University rankings come from the QS World Rankings available to students in the year they submitted their exchange requests. The *p*-values are for two-sided *t*-tests of the difference between male and female students' average first-year grades or top-choice exchange university rankings. The French citizenship variable does not include dual citizens.

Table 9. Summary of survey responses: Exchange university criteria

	Mean score (Scale of 0–10)		t-test <i>p</i> -value	K-S test <i>p</i> -value
	Male	Female		
<i>Panel A: Academic experience</i>				
Academic reputation of university	6.87	6.85	0.90	0.95
University program fits my professional goals	7.00	7.16	0.38	0.58
Ranking of the university	6.13	6.31	0.34	0.95
Program prepares me for selective Master’s degree	5.81	5.59	0.34	0.23
<i>Panel B: Cultural experience</i>				
Discovering a new culture	7.35	7.76	0.01	0.03
Improving your language skills	8.06	8.19	0.43	0.07
Easy to travel to other places	6.66	7.38	<0.01	<0.01
Unique opportunity to live in the country	6.81	7.38	<0.01	0.02
<i>Panel C: Campus life</i>				
Diverse student body at the university	5.63	6.36	<0.01	<0.01
Interest in a US-type campus lifestyle	4.23	4.44	0.39	0.85
Studying at a small university	3.16	3.19	0.87	1.00
Studying at a large university	4.33	4.55	0.29	0.69
Non-academic campus activities are interesting	6.06	6.82	<0.01	<0.01
<i>Panel D: Environment</i>				
Studying in an urban environment	5.91	6.20	0.18	0.36
Studying in a rural environment	3.11	2.71	0.03	0.12
Pleasant weather	4.29	4.99	<0.01	<0.01
Safe environment	6.00	6.99	<0.01	<0.01
Cost of living (expenses other than schooling)	5.74	6.35	<0.01	0.01

This table summarizes the responses of 247 male and 370 female respondents to a 2016–17 academic year survey of second-year Sciences Po students. The sample excludes students in a dual degree with a foreign university, as well as students who completed an internship. The exact wording of the survey questions is available in Appendix B. The *p*-values are for a two-sided test of the difference between male and female students’ responses. The Kolmogorov-Smirnov (K-S) test *p*-values are for a test of the equality of the distribution of survey responses by question.

Table 10. Probit analysis of students' survey responses

Dependent variable:	Assigned a top in this category?				Assigned a top score score <i>only</i> in the academic category?
	Academics (1)	Culture (2)	Campus (3)	Environment (4)	
Female student	-0.20 (0.13)	0.32*** (0.12)	0.36** (0.15)	0.21** (0.09)	-0.43*** (0.15)
Average 1st year grade	0.17*** (0.05)	-0.11* (0.07)	-0.17* (0.09)	-0.09*** (0.03)	0.21** (0.10)
Female × Average 1st year grade	-0.01 (0.06)	-0.01 (0.10)	0.09 (0.10)	0.08** (0.04)	0.01 (0.17)
<i>Fixed effects</i>					
Campus	X	X	X	X	X
Citizenship	X	X	X	X	X
Admissions type	X	X	X	X	X
Pseudo R^2	0.09	0.07	0.06	0.05	0.10
No. of observations	616	616	616	616	616

This table summarizes results from probit specifications where the dependent variable is whether respondents assigned the relevant category their top score (columns 1–4) or exclusively their top score to the academic category (column 5). All regressions include admissions, citizenship and campus fixed effects. Average grade is demeaned with respect to its sample mean before it is interacted with the indicator for female students. Standard errors, adjusted for clustering at the campus level, are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table A1. Enrollment by gender in France, 2017–2018

	Total # of students	% women
<i>Panel A: Academic level</i>		
Bachelor	1,016,420	56.0
Master's	612,274	56.0
Doctoral	65,535	47.5
<i>Panel B: Field of study</i>		
Health	281,703	57.7
Sports	54,667	29.6
Dentistry	10,009	54.6
Medicine	134,526	63.5
Pharmacy	23,410	63.8
Pluridisciplinary health	59,091	68.6
Sciences	278,126	41.6
Computer science	46,913	15.4
Mathematics and computer science	2,369	21.8
Physics	19,279	27.0
Pluridisciplinary fundamental sciences and applications	16,715	27.7
Mathematics	29,035	31.1
Physics & chemistry	8,350	36.3
Pluridisciplinary sciences	35,802	41.4
Sciences of the Universe	9,301	42.6
Chemistry	20,438	53.0
Pluridisciplinary life, health, earth, univers sciences	10,215	60.4
Life sciences	79,709	63.1
Engineering	162,847	23.8
Mechanical engineering	21,782	14.1
Electronic and electrical engineering	17,886	14.3
General engineering	7,857	19.8
Civil engineering	12,011	20.6
Industrial sciences & technology	98,694	27.9
Process engineering	4,617	33.4
Social sciences	750,758	62.9
Applied mathematics and social sciences	6,379	40.4
Geography	4,456	47.6
Pluridisciplinary economics and management	45,069	48.5
Economics	34,772	49.5
History	50,376	53.8
Planning	8,428	55.5
Management	130,874	55.7
Pluridisciplinary human and social sciences	19,573	56.2
Political science	27,145	58.0
Economic and Social Administration	31,325	58.5
Pluridisciplinary law, economics & administration	2,025	60.7
Information & communication sciences	33,672	64.3
Archeology, ethnology, prehistory	4,515	65.6
Law	171,953	66.6
Pluridisciplinary law and political science	1,948	66.7
Sociology & demography	24,294	68.3
Education sciences	77,031	75.6
Language sciences & linguistics	13,462	79.9
Psychology	63,461	80.7

Table A1. Enrollment by gender in France, 2017–2018 – *continued*

	Total # of students	% women
Languages, literature, arts	220,795	69.7
Religion	1,318	44.3
Philosophy & epistemology	12,300	49.8
Arts	36,294	61.5
Ancient languages and literature	343	62.1
Regional cultures and languages	315	67.0
General and comparative literature	954	70.9
Pluridisciplinary literature, languages, arts	5,291	72.8
Foreign languages & literature	63,921	73.0
Applied foreign languages	44,268	73.1
French foreign language	6,830	73.1
French language & literature	35,313	73.3
Pluridisciplinary literature, languages, humanities	11,412	73.4
Pluridisciplinary languages	2,236	75.4

Source: OpenData, Ministère enseignement supérieur et de la recherche, 2020.

Url: <https://data.enseignementsup-recherche.gouv.fr/>.

Table A2. Studying abroad vs. completing an internship

Dependent variable: <i>Exchange program participation?</i>	
Female student	-0.011 (0.011)
Average 1st year grade	0.029*** (0.007)
Female × Average 1st year grade	0.008 (0.008)
<i>Fixed effects</i>	
Cohort	X
Citizenship	X
Admissions type	X
Adjusted R^2	0.18
No. of observations	4,096

This table summarizes results from a linear probability regression of an indicator for exchange program participation on the students' gender, average first year grade and their interaction, as well cohort, citizenship and admissions type fixed effects. The sample includes students who participated in the exchange or completing an internship in 2012–13, 2013–14 and 2014–15. We are missing grade data for three students on the Paris campus. Average grade is demeaned with respect to its sample mean before it is interacted with the indicator for female students. Standard errors, adjusted for clustering at the cohort level, are reported in parentheses. *** indicates statistical significance at the 1% level.

Table A3. Examples of exchange universities by region

U.S.A.	Canada	South Asia	Eastern Europe	Africa	Southern Europe
Columbia U	U of Toronto	Jawaharlal Nehru U	U of Warsaw	U Cath Afrique Centrale	U Autunoma de Barcelona
MIT	Queen's U	Christ U	Charles U in Prague	Ghana Institute of Management	U de Barcelona
U of California	Simon Fraser U	Jamia Millia Islamia	Moscow State U	Kenyatta U	U Degli Studi Di Bologna
U of Pennsylvania	U of Calgary		U of Tartu	U of Makerere	U Pompeu Fabra
Princeton U	McGill U		Szkola Glowna Handlowa		U de Salamanca
U of Michigan	U of Western Ontario	Southeast Asia	Jagiellonian U of Krakow		U Degli Studi Di Roma
Northwestern U		National U of Singapore	Metropolitan U	Western Europe	Instituto de Impresa
U of Texas		Nanyang Technological U	U of Economics Prague	Erasmus U Rotterdam	U Pontificia de Salamanca
Pennsylvania State U	Australia & New Zealand	Chulalongkorn U	U of Bucarest	U Van Amsterdam	U Rey Juan Carlos
Boston U	Australian National U	U of Malaya	Higher School of Economics	Katholieke U Leuven	U Degli Studi Di Padova
Ohio State U	U of Queensland	U Gadjah Mada	MGIMO	Humboldt U Berlin	U Degli Studi Di Trieste
U of Washington	Monash U	Hoa Sen U	RANEPA	U St Gallen	U de Coïmbra
U of Illinois	U of Auckland	Vietnam National U	State U Lobatchevski	Freie U Berlin	
Indiana U Bloomington	Griffith U		U Economics in Bratislava	U Tilburg	
Johns Hopkins U		Middle East		U Maastricht	Northern Europe
U of Virginia		Hebrew U of Jerusalem		U College Utrecht	U of Aarhus
U of Florida	East Asia	American U of Beirut	Latin America	U Wien	Lund U
Georgia Tech	U of Hong Kong	American U of Cairo	U Federal Rio de Janeiro	U Antwerpen	U of Helsinki
U of Pittsburgh	Hong Kong U Science & Tech	U du Caire	FLASCO	U Bonn	Uppsala U
Rutgers U	Chinese U of Hong Kong	U of Kurdistan	U Catolica de Argentina	U de Lausanne	Copenhagen Business School
Rice U	U of Tokyo	U of Haifa	U de San Andres (UDESA)	U Freiburg Breisgau	U of Tampere
U of Miami	Seoul National U	U of Jordan	U Nacional Tres de Febero	U Konstanz	U of Vaasa
U of Missouri	Fudan U	American U of Kuwait	U Catolica Sao Paolo	Technische U Berlin	U of Iceland
Bryn Mawr College	National Taiwan U	Lebanese American U	U Federal Pernambuco	Bard College Berlin	
DePaul U	Yonsei U	U Saint Joseph	U Adolfo Ibanez (UAI)	Jacobs U Bremen	
Hampshire College	Renmin U	EGE Rabat	U Catolica de Valparaiso	Ludwig Maximilian U	UK & Ireland
Middlebury College	Nanjing U	U Al Akhawayn	U Externado	M Luther U Halle Wittenberg	Trinity College
Syracuse U	National Chengchi U	Al-Quds U	U Espiritu Santo (UEES)	U Zeppelin Friedrichshafen	U of Oxford
Saint Mary's College Maryland	Hitotsubashi U	Koç U	Colegio de Mexico	U Leipzig	U College London
San Diego State U	Jiao Tong U	Marmara U	U de Las Americas	U Potsdam	King's College London
Sarah Lawrence College	Hong Kong Baptist U	Mid East Tech U Ankara	U Iberoamericana	U Viadrina Frankfurt/Oder	U of Nottingham
Smith College	Ritsumeikan U		U Del Pacifico	U Graz	U of Bristol
U of San Francisco	Sophia U			U de Mons Hainaut	U of Exeter
U Wisconsin Milwaukee	Tokyo U of Foreign Studies			U de Neuchâtel	U of Bath
Vassar College	National Taiwan Normal U				U of Cardiff
Wesleyan U					U of Aberdeen

This table presents a random sample of approximately half of the exchange universities that were available to Sciences Po students during the 2014–2015 academic year. University names were abbreviated by the authors for presentation.

Table A4. Survey: Summary statistics for questions about subjective expectations

	Male	Female	t-test of diff. (<i>p</i> -value)
<i>Panel A. Risk and competition</i>			
Would ask if 80% chance of getting ideal university (%)	98	98	0.70
Would ask if 60% chance of getting ideal university (%)	93	92	0.46
Would ask if 40% chance of getting ideal university (%)	65	63	0.60
Would ask if 20% chance of getting ideal university (%)	36	37	0.90
<i>Panel B. Confidence</i>			
Declared first-year average grade	14.00	13.96	0.72
Overestimate grade by more than 0.5 points (%)	19	21	0.62
Underestimate grade by more than 0.5 points (%)	22	20	0.55
Declared 1st year academic standing (%)			
Top 5%	4	5	0.60
Top 5–10%	13	13	0.96
Top 11–25%	26	22	0.34
Top 25–50%	44	45	0.66
Below median	13	14	0.88

This table summarizes the responses of 247 male and 370 female respondents to a 2016–17 academic year survey of second-year Sciences Po students. The exact wording of the survey questions is available in Appendix B. The *p*-values are for a two-sided test of the difference between male and female students' responses.

Appendix B Third year Abroad Survey: Questions

Note: Students completed this survey in English.

The objective of the survey is to provide Sciences Po's administration and researchers with a better understanding of how 2nd year students choose universities for their third year abroad.

Your answers will remain anonymous to the administration. This survey is completely unrelated to the official final choices that you will be giving in December.

We are very grateful for the time you will spend on this survey, which takes about 5-10 minutes to complete. Please answer truthfully to as many questions as possible. There are no right or wrong answers.

Please make sure that you complete the survey and validate your answers by clicking on "ENVOYER" (blue button) on the final page.

Section 1

1. Are you a Dual Degree student ?

- No
- Yes, with an international university
- Yes, with a French university

Note: international dual degree students actually do not choose a university. Dual degree students with a French university have a limited set of options

Section 2: University characteristics

2. How important are each of the following variables in determining your choices of universities for your 3rd year abroad next year?

Please note: if you give the same level of importance to several variables, that means that these variables are of equal importance to you.

Ex: if you give 5 to "Discovering a new culture" and to "Fits professional goals", that means that you think that both variables are of equal importance. If you give 6 to "Studying in a large university" that means that "Studying in a large university" is more important to you than "Discovering a new culture" and "Fits professional goals".

- Discovering a new culture

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely
at all	<input type="radio"/>	essential									

- Improving your language skills

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely
at all	<input type="radio"/>	essential									

- Academic reputation of university

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely
at all	<input type="radio"/>	essential									

- Diverse student body at the university

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- Interest in a US-type campus lifestyle

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- University program fits my professional goals

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- Studying in an urban environment

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- Studying in an rural environment

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- Pleasant weather

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- Studying at a small university

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- Studying at a large university

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- Easy to travel to other places

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- Safe environment

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- Ranking of the university

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- The chance to live in a country that I otherwise wouldn't have the opportunity to

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- University program prepares me for a selective Master's degree

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										
- Cost of living (expenses other than schooling)

Not important	1	2	3	4	5	6	7	8	9	10	Absolutely essential
at all	<input type="radio"/>										

- Non-academic campus activities are interesting

Not important at all 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 Absolutely essential

- Are there other criteria you find important? _____

Section 3: Your ideal university

DEFINITION: This section refers to the university you would IDEALLY like to rank as your top choice. The ideal university is your dream university: the one you would choose if you were completely free to go anywhere. It is the university you would choose if there was no competition for a limited number of slots in each university. It is not necessarily the university you actually plan to rank as your top choice.

3. What is the name of your IDEAL university among the universities that are offered by Sciences Po? _____

Describe how intensely you would like to attend this university

I actually do not really care 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 I would strongly like to attend

4. What do you think is the percent chance that you will ASK for your ideal university as your 1st choice when completing your application in December?

- 0% 40% 80% I do not have an ideal university.
 10% 50% 90%
 20% 60% 100%
 30% 70%

5. What do you think is the percent chance that you would GET your ideal university, if you asked for it as your 1st choice?

- 0% 40% 80% I do not have an ideal university.
 10% 50% 90%
 20% 60% 100%
 30% 70%

6. Do you think that there will be strong competition for your ideal university?

No competition at all 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 Extreme competition

7. If you knew that you had a 80% chance of obtaining your ideal university as a 1st choice, would you ask for it?

- Yes No

8. If you knew that you had a 60% chance of obtaining your ideal university as a 1st choice, would you ask for it?
- Yes No
9. If you knew that you had a 40% chance of obtaining your ideal university as a 1st choice, would you ask for it?
- Yes No
10. If you knew that you had a 20% chance of obtaining your ideal university as a 1st choice, would you ask for it?
- Yes No
11. If you do not plan to ask for your ideal university, what is the name of the university you are most likely to ask for your 1st choice? _____
12. Are you planning to do an internship or a personal project instead of studying abroad?
- Yes No

Section 4: Questions about you

13. What is your approximate overall 1st year average grade? _____
What is your (approximate) overall academic standing among Sciences Po students? _____
14. Campus
- | | |
|--------------------------------|--|
| <input type="radio"/> Dijon | <input type="radio"/> Menton |
| <input type="radio"/> Le Havre | <input type="radio"/> Nancy |
| <input type="radio"/> Paris | <input type="radio"/> Reims: Euro-American program |
| <input type="radio"/> Poitiers | <input type="radio"/> Reims: Europe-Africa program |
15. High school degree: do you have a French Baccalauréat?
- Yes No
16. Gender
- Male Female Other