# Geographic Mobility of College Students and the Gender Gap in Academic Aspirations

Lídia Farré
University of Barcelona and IAE-CSIC

Francesc Ortega*
CUNY, Queens College

September 21, 2021

**Abstract**

We study the decision to pursue an advanced degree from an internationally renowned institution, which greatly facilitates access to top jobs. Relying on unique data on applications to a highly selective program that provides graduate fellowships to Spanish students, we show that women apply for the fellowships at lower rates than observationally equivalent male graduates. To dig deeper on the mechanisms, we conducted a large-scale survey on current college students regarding their intended educational investments after graduation. The survey data confirm that female students interested in post-graduate studies are substantially less likely to seek admission in foreign institutions than comparable men. Moreover, we find that females' less ambitious educational choices are tied to lower expected earnings, a stronger preference for children, and lower geographic mobility. We also show that females' lower mobility is partly due to *current* family ties.

*JEL Classifications*: J3, J7
*Keywords*: Gender; Post-graduate; Fellowships; Family ties; Geographic Mobility.

*We are grateful to the *La Caixa Foundation* and the participating universities for providing access to their data and for their overall support. We also thank Pol Campos-Mercadé, Rosa Ferrer, Paola Giuliano, Laura Hospido, Pedro Rey, Carlos Sanz and Judit Vall for helpful comments. We are particularly indebted to Amparo Asensi, Dolors Baena, David Casado, Domènec Espriu, Montserrat Masoliver, Jessica Pan, Pablo Pareja, Raul Ramos, Santi Roca and Josep Ros. We acknowledge the financial support of the Ministry of Science and Innovation (grant PID2019-110397RA-I00), the Government of Catalonia (grant SGR2017-644) and the *La Caixa Foundation*. E-mail: lidia.farre@ub.edu and francesc.ortega@qc.cuny.edu.

# 1 Introduction

In the last few decades gender gaps in the labor market have narrowed, largely thanks to the increase in women's educational attainment. Women account for over 60% of recent college graduates in many countries, but remain under-represented in top positions, both in academic settings and in the private sector (Blau and Kahn (2017)). A vast literature explores the many factors that contribute to this persistent gender gap.

Our paper focuses on a new angle: a college degree or even an advanced degree often do not guarantee access to top jobs. Both in academia and private sector, being hired for a high-paying position at a leading firm or public institution often requires a post-graduate degree from an internationally renowned university, particularly for entry-level positions. Despite accounting for the majority of college graduates, women remain in the minority in many prestigious graduate programs. Evidence from the field of Economics & Business illustrates this point. Top MBA programs remain majority male (Wallen et al. (2017)) and women account for only 32% of the entering cohorts in Economics Ph.Ds (Bayer and Rouse (2016) and Boustan and Langan (2019)).[1]

We hypothesize that college-educated women make less ambitious post-graduate educational choices than their male counterparts. This could be a subtle, yet important, factor to help explain the absence of women in top positions in the labor market, impacting their chances to be hired for a top job or to remain in one when having children (as in Cortes et al. (2020)). More specifically, we examine the post-graduate plans and choices of college-educated men and women through the lens of participation in a highly selective fellowship program. Gaining admission to internationally renowned graduate programs is difficult, because of the harsh competition. It is also expensive in terms of tuition and other expenses, and typically requires moving to a different city or country. For these reasons, and because of high social payoffs in terms of innovation and knowledge diffusion, governments and philanthropic institutions in many countries offer fellowships to academically excellent students interested in pursuing graduate studies at the world's leading universities.[2]

We examine college graduates' decision to apply to the *La Caixa Foundation* (LCF) Fellowship Program, largely aimed at funding graduate studies abroad for Spanish cit-

[1] Women are also under-represented in STEM fields that are typically associated with above-average labor market prospects, and are also less likely to pursue professional degrees and doctoral studies (e.g. Bertrand and Hallock (2001), Black et al. (2008) and Hsieh et al. (2019).)

[2] One of the most famous graduate fellowship programs in the world is the *Fulbright U.S. Student Program*, established in 1946, and offering approximately 2,000 grants each year. Alumni of the program occupy leading positions across a wide range of professions.

izens with excellent academic records. These data provide a unique window into the educational choices of high-achieving male and female college graduates. Specifically, we combine data on the whole set of applicants to the program over a number of years with administrative graduation records for four large universities. These data allow us to estimate the application rates of male and female college graduates with a high level of disaggregation, and to parse out the effects of academic ability and socioeconomic status, in addition to gender. Furthermore, we conducted a large survey of the current students in the universities included in our study to shed light on the factors influencing post-graduate educational choices. In particular, the survey contains rich information regarding students' economic and family expectations as well as other preferences and constraints that may affect educational decisions.

Our analysis reveals that GPA is the most important determinant of the decision to apply to the LCF program, although socio-economic status and field of study also play important roles. We also find that the aggregate application rates of male and female graduates are practically the same. However, this masks a large gender gap due to offsetting differences in characteristics (largely field of study and average grades). Our most detailed estimates suggest that female college graduates are 22% less likely to apply for the LCF fellowships than male graduates with equal grades, socio-economic status, and in the same field of study and university. We also document that women are less likely to seek funding to complete a Ph.D. or to study in another country. This evidence suggests that the educational aspirations of college-educated women are lower, on average, than for comparable men.

To further investigate post-college educational choices, we conducted a large survey among the (approximately 35,000) students currently enrolled in the four universities included in our study. Our analysis shows that students with higher grades are much more likely to intend to pursue graduate studies abroad and to seek funding from competitive fellowship programs (with the exception of students in STEM fields). We also find that female college students are less likely to seek funding to study abroad than comparable men, even though this gap disappears when they are asked to consider a hypothetical scenario where they did not face economic or family constraints.

The above-mentioned factors constrain the geographical mobility of female college students and lower their educational aspirations in a quantitatively important manner. Our survey data show that 68% of female college students are interested in graduate studies and that 60% of these women would like to study abroad in the absence of economic and family constraints. However, when female college students take into account the actual constraints they face, only 24% of those interested in graduate studies consider studying abroad is feasible for them.[3]

A deeper investigation of the barriers to study abroad perceived by students reveals that *expectations* about future earnings and family plans strongly correlate with students' post-graduate plans. In addition, we also identify an important role for *current* family ties in limiting women's geographical mobility and their willingness to study abroad. This finding relates to recent studies showing that commuting disproportionately penalizes women in the labor market (Le Barbanchon et al. (2019), Fluchtmann et al. (2020) and Petrongolo and Ronchi (2020)). Our findings imply that geographical distance is also a larger impediment for females in the context of their *educational* choices, introducing a *proximity-prestige tradeoff*.

Our results contribute to the literature on the absence of women in high-earnings, high-status positions, often referred to as the glass ceiling (Bertrand et al. (2019)). Several explanations have been proposed to account for the gender disparities at the top of the labor market. Early studies emphasized gender discrimination (Rouse and Goldin (2000)) and differences in skill levels (Goldin et al. (2006)). More recently, researchers have also documented gender differences in preferences for competition (Niederle and Vesterlund (2007), Buser et al. (2014), Hospido et al. (2019)) and in the balance between family and work (Bertrand (2013), Azmat and Ferrer (2017), Bursztyn et al. (2017), Keloharju et al. (2019) and Hospido et al. (2019)). In addition, several studies have also pointed out the role of reviewers in candidate selection processes, whose decisions may be affected by implicit bias, gender stereotypes or other factors (Bagues and Esteve-Volart (2010), Breda and Ly (2015), Hospido and Sanz (2019), Farré and Ortega (2019), Montalban and Sevilla (2020)).

Our findings indicate that explanations based on differences in human capital accumulation remain important: highly talented women make less ambitious educational choices than their male counterparts. In line with previous studies, our results indicate that economic and family expectations are strongly correlated with future career plans (Azmat et al. (2020) and Wiswall and Zafar (2021)). However, we also show that *current* family ties, measured by hours of care provided within the family and having a romantic partner, restrict women's decision to study abroad with likely negative effects on their careers.[4]

[3]Azmat and Kaufmann (2021) analyze how changes in a students' socioeconomic context affect student's college plans and their eventual educational attainment.

[4]The issue of the geographical mobility of male and female workers has regained interest in the recent years. Several studies document that marriage, cohabitation and children reduce women's mobility to

Last, our paper also contributes to the literature comparing the academic achievements of boys and girls. It is well established that, from an early age, girls "leave boys behind" in terms of educational attainment (Fortin et al. (2015)). However, the evidence is less clear in regards to the comparison between the most talented males and females. Our data contain individual records for over 160,000 college graduates and allow us to produce highly detailed comparisons of the GPA distributions by gender with high granularity. We find that while women typically have higher mean GPA than men, they tend to be under-represented in the top 5% of the grades distribution (for a given major and university).[5] This difference could be relevant to explain the gender gaps in highly meritocratic contexts, such as seeking admission to graduate studies at a leading institution. Our estimates show that the probability to apply for a LCF fellowship increases exponentially for high-GPA students. However, the difference in the shares of men and women among high-grade earners are too small to explain away the observed gap in participation rates in the program.

The structure of the paper is as follows. Section 2 presents our data sources. Section 3 estimates aggregate application rates in the fellowship program using data for the four universities included in our study. Section 4 extends the analysis further by focusing on individually linked records for a single university. Section 5 examines students' preferences and interest in post-college educational plans. Section 6 discusses the mechanisms that account for the gender gaps in applications, and Section 7 concludes.

# 2 Data Sources

## 2.1 Applications to LCF Fellowships Program

The *La Caixa Foundation* (LCF) is a private financial institution in Spain that has been providing graduate fellowships since 1982. The LCF fellowship program is the largest program in Spain funding graduate studies abroad, currently awarding 120 fellowships

a larger extent than men's. For instance, Shauman and Xie (1996) find lower geographic mobility for female scientists. They argue that this is related to their higher likelihood of being in dual career marriages and that their mobility falls further, relative to their male partners, when they have children. Similarly, Jürges (2006) documents that marital status (and cohabitation) reduce the geographical mobility of women relative to men, confirming the earlier work of Bielby and Bielby (1992) and others.

[5] The under-representation of women among extremely high-achieving students has also been documented for the US among high school students in math (Ellison and Swanson (2010)). It is also well-known that males' aptitude test scores exhibit larger variance than females', and that males outnumber females among high-achievers along several (but not all) dimensions (Hedges and Nowell (1995)).

per year (plus around 100 more for graduate studies in Spain).[6] The awards fund both Master's degrees and PhDs in all fields of study and the fellows typically gain admission to the most prestigious institutions worldwide.[7]

Our data contains applications for the period 2014-2018 to three separate FLC sub-programs: graduate studies in North America or Asia, in European countries (other than Spain) and doctoral studies in Spain.[8] The data contains complete information on roughly 9,000 applications, 55% of which from female candidates. The success rate (relative to complete applications) is around 9%.[9]

## 2.2 College graduates records

We obtained access to the individual (anonymized) graduation records of the 4 largest public universities in Catalonia: the University of Barcelona (UB), the Autonomous University of Barcelona (UAB), the Polytechnic University of Catalonia (UPC) and University Pompeu Fabra (UPF). These universities are located in the Barcelona metropolitan area and together account for 77% of the enrollment in public colleges in Catalonia.[10] Three of these universities offer a large number of majors across all major fields of study, whereas UPC is almost completely specialized in engineering.

Our period of analysis ranges from academic year 2009-2010 to 2018-2019 and the data have wide coverage across all academic disciplines. Among the roughly 162,000 individual observations, about 43.3% of the graduates belong to Social Sciences, 31.2% to STEM disciplines, 13.7% to Health & Life Sciences, and 11.8% to Arts & Humanities.

The graduation records include student-level information on year of graduation, major, gender and GPA. The data show that 55.4% of all graduates are women. Across

[6]Similar programs aimed at Spanish citizens are the Foundation Alonso Martin Escudero (60 fellowships), the Foundation Mutua Madrilena (40), Fulbright (25), the Ramon Areces Foundation (22), Rafael del Pino Fellowships (10) and the Foundation Barrie (10).

[7]To date, the LCF has funded close to 5,000 awards, with 70% funding studies abroad. The top destination countries are USA, Spain, UK, Germany and France. Similarly, the top (narrow) fields of study have been: Art & History (14%), Health Sciences (13%), Engineering (13%) and Economics & Business (12%).

[8]The latter sub-program also requires geographic mobility. The host institution cannot be located in the province where the candidate conducted his/her undergraduate studies.

[9]Importantly, women account for only 49% of the successful applicants. For a detailed analysis of the determinants of success in the program, see Farré and Ortega (2019). Another study employing data from the *La Caixa Foundation* fellowship program is Garcia-Montalvo (2014), which showed that the labor market careers of award recipients experience a large and persistent boost (both in academia and private sector).

[10]Public colleges account for 85% of the overall (in-person) tertiary enrollment in Catalonia, which amounts to 173,485 students in academic year 2018-2019.

fields, we observe that they account for a large majority in all fields, except for STEM where women are only 28.8% of the graduates. The female share rises to 65.7% in Social Sciences, 67.5% in Arts & Humanities and 73.2% in Health & Life Sciences.

Graduation GPA is reported on a 0-10 scale (with a minimum of 5 required to pass a class). Across all graduates, the mean GPA is 7.11. However, we observe differences by gender and also field of study. The average GPA for women is 7.23, about 4% higher than for men (6.96). By field of study, the highest mean GPAs are found in Health (7.45) and Arts & Humanities (7.42), followed by Social Sciences (7.16) and STEM (6.79), indicating that grading tends to be harsher in the latter field.[11]

The University of Barcelona (UB) agreed to share with us information on students' family background (e.g. parental education and occupation) and, more importantly, to link their data with the LCF applications dataset at the individual level.[12] The UB is the largest university in our dataset, accounting for almost half of the graduates.[13] It is also fairly similar to the other universities in terms of the share of females (65% in academic year 2018-2019) and enrollment distribution across fields of study, with the exception of UPC that specializes in engineering. The LCF applications dataset contains 588 complete applications from UB graduates, corresponding to 506 unique individuals, over the period 2014-2018. The data show that 44 of these applicants were awarded a fellowship, that is, the success rate was 8.7%.

## 2.3 Survey College Students

We conducted a survey of all students at our four participating universities that had completed over half of the 240 credit hours required for graduation (and had registered for at least one class in academic year 2019-2020). The survey was conducted online in January-February 2020 and the response rate was 14%, leading to 4,848 essentially completed questionnaires out of a target population of 34,559 students.[14]

[11]Mean GPAs are very similar across all universities (ranging between 7.23 and 7.29) except for the engineering school where the mean value is 6.72.

[12]Obtaining permission to match administrative data across different sources has become much more difficult after the application of the General Data Protection Regulation (GDPR) in the European Union. This regulation was adopted in 2016 but implemented from May 25, 2018). To link the two datasets while preserving student anonymity, each party encrypted the students' National Identification Number using the same key. Then we simply merged the two datasets on the basis of the encrypted identifier.

[13]The overall number of UB graduates for academic years 2009-2010 through 2018-2019 is 75,596, or approximately 7,500 per year (Table C.13). Further details can be found in Appendix Table C.14.

[14]This response rate is quite typical of online surveys conducted by these universities on their own student population. The response rate for our survey also compares favorably to Paredes et al. (2020).

The survey respondents match well the administrative records in terms of gender, field of study and GPA. In particular, 58% of the respondents are women, 39% of respondents are STEM majors, and the *average* GPA is almost the same for men and women in the same field of study.[15] We present a comprehensive set of descriptive statistics for the survey in Section 5.

# 3 Aggregate application rates

Using administrative records on the graduates of 4 large universities for the period 2009-2010, we now compute the application rates to the FLC program on the basis of these data.[16] We refer to the resulting application rates as *aggregate* because the calculation does not require linking individuals across the graduation records and the applications dataset, which we can only do for one university. Naturally, gender differences in academic ability, age, or socio-economic status can introduce differences in the fellowship application rates of men and women that we cannot control for. In other words, this section can only provide gender gaps in *unconditional* application rates but we can utilize the graduation records from all four universities in our study.[17]

---

If we include questionaries that are only partially complete the response rate increases to 16%.

[15]In the survey, 39% of the respondents are in STEM fields, 31% in Social Sciences, 18% in Health and 13% in Arts & Humanities. By university, the survey female shares range between 66% and 69% for the UB, UAB and UPF and fall to 30% for the engineering school (UPC). The corresponding values in the administrative records (2009-2018) are 60% to 64% and 27%, respectively. Turning now to GPA, the mean value among all survey respondents is 7.2, only slightly above the average of 7.1 found in the administrative records. The average (self-reported) GPA in the survey ranges between 7.23 and 7.40 for the three universities with a broad range of majors but it is significantly lower at the engineering school (6.77). These figures closely match the corresponding numbers in the administrative records. We also note that the students that complied and completed the survey tend to be positively self-selected in terms of grades: 32.6% and 18.8% have grades above the 75th and 90th percentiles, respectively (relative to the grade distribution based on university-field in the administrative records). The administrative records show that women, on average, obtain slightly higher grades than men in all universities (with female-male ratios ranging between 1.02 to 1.03) with the exception of the UPC, which effectively exhibits gender parity (0.996 FM ratio). The situation is similar in the survey data, although the gender gaps are narrower. For the UPC respondents, the female-male ratio is estimated to be 1.003, while the values for the other universities range between 1.001 and 1.014. The narrower GPA gender gaps are consistent with the higher response rates for women and high-GPA students.

[16]Our data begins with academic year 2009-2010 and ends with 2018-2019. For short, we refer to each academic year on the basis of the Fall semester. Hence, following this convention, our data is for the period 2009-2018. For each of the more than 160,000 graduates in our data, we observe the year of graduation, the major, the gender and the GPA. Importantly, the FLC applicants dataset contains the university of origin, the graduation year, field of study, and the gender of each applicant. The field of study identifies the discipline in a broad sense. Thus, each field of study contains several majors.

[17]We are authorized to identify data pertaining to the UB but, at this point, we can only report figures pertaining to the other universities when pooled together.

Besides estimating application rates, the graduation records also allow us to carry out a highly detailed characterization of the whole distribution of GPA by gender and field of study. This analysis is particularly important for our purposes because there may be gender differences at the upper tail of the GPA distribution, which is the population more likely to consider participation in the LCF fellowship program.

To compute the aggregate application rate (AR) we tally the number of applicants of a given gender $g$ that graduated in year $t$ in field of study $f$ from university $u$ ($Applicants_{g,f,u,t}$) and divide it by the number of graduates at the same level of aggregation ($Graduates_{g,f,u,t}$).[18] That is,

$$AR_{g,f,u,t} = \frac{Applicants_{g,f,u,t}}{Graduates_{g,f,u,t}}. \tag{1}$$

Clearly, we can compute application rates at a more aggregated level, adding across years, universities or fields of study. More importantly, our dataset only contains applications to the LCF fellowship program for years 2014-2018. As we explain in detail in Appendix A, this creates a censoring problem. We address it by focusing on graduation cohorts 2012-2014, which are largely free of this problem.

Table 1 collects our estimates for the application rates in the FLC program. The top panel reports the aggregate application rates obtained when using all graduation cohorts (2009-2018). The first column shows that the FLC program received 1,530 applications (between 2014 and 2018) by graduates from the 4 universities in our study, which accounts for slightly less than one fifth of all the applications they received over that period. Restricting to the uncensored cohorts (second panel), the number of applications falls to 815. The second panel (Uncensored cohorts) also shows that the number of female applicants was 20% higher than the number of male applicants. Likewise, the number of female graduates was also 20% higher than the corresponding figure for males. As a result, we estimate an application rate of 1.66% for both genders.

In light of these estimates, it would be tempting to conclude that male and female college graduates have similar educational ambitions, in terms of attending prestigious graduate programs. However, it is important to recognize that there are important gender differences in fields of study (with women severely under-represented in STEM), average grades and over the preferred type of graduate degree (Master's versus Ph.D.).

[18] Clearly, the LCF applicants in year $t$ may have graduated in a previous year. We examine this issue further below. For now, it suffices to point out that the overall number of graduates in a given university and field of study is fairly constant over our sample period. Thus, the normalization we are applying will not be far from the true application rate.

To get a sense of the role of field of study, we grouped all majors into 4 broad areas: STEM, Health & Life Sciences, Arts & Humanities and Social Sciences. Table 1 reports the application rates by field. Focusing on the second panel, which pools all universities, we find application rates above the 1.66% average in all fields except for Social Sciences. The highest application rate is found in Health & Life Sciences (3.41%), followed by Arts & Humanities (2.20%) and STEM (1.84%), while the lowest value is found in Social Sciences (0.87%).[19] The same pattern is found in each of the 3 universities offering majors across all fields of study.

In terms of application gender gaps, the data suggest a female advantage in STEM (female-male ratio FM=1.31), gender parity in Arts & Humanities (FM=1.01), and lower female participation in Health & Life Sciences (FM=0.87) and in Social Sciences (FM=0.80).[20] Because women are highly under-represented in STEM and highly over-represented in Social Sciences, gender differences in field of study will account for an important part of the application gender gap obtained when pooling together all fields of study.

The application registries also allows us to study gender differences in preferences for geographical mobility and length of graduate studies. In fact, the FLC fellowship program funds both PhDs and Master's degrees. In addition, about 30% of the fellowships are given out through a sub-program that funds PhD studies within Spain (but in a province that differs from the one where the applicant attended college).

As shown in Table 2, the overall application rate (pooling fields, genders and sub-programs) is 1.66%, and the majority of applicants (0.87/1.66=52%) are interested in Master's degrees abroad, 17% in PhDs abroad and 31% seek funds for PhDs in Spain. In terms of gender gaps, the figures in the Table reveal that the female-male ratio in applications seeking to fund Master's degrees abroad is 1.04, indicating that women are slightly more interested than men in this type of program. In contrast, the data suggest that the demand for PhD programs abroad is substantially lower for women than for men, with a corresponding female-male participation ratio of 0.81. Hence, conditional on location outside of Spain, women are less interested than men in enrolling in a PhD program. It is also informative to compare the application rates by gender seeking to

[19] Many factors may explain why interest in graduate studies abroad differs across fields. An obvious one is that Social Sciences includes majors in Law and Social work that involve a great deal of country-specific knowledge.

[20] In fact, for all four universities in our study, we observe STEM female-male application ratios above one (ranging between 1.06 and 2.55), as shown in Table C.10. It is worth noting that the gender-specific application rates obtained when pooling all universities are weighted sums of the corresponding values for each of the universities. However, this is not the case for the female-male ratios.

fund PhD programs in Spain. The data reveal that the female participation rate is 6% higher than the male value. Thus, conditional on being interested in PhD studies, women are substantially less keen than men in studying abroad. While this could reflect differences in 'pure' preferences, it may also stem from the presence of family or economic constraints that may lead men and women to make different choices even if their objective functions are similar. We return to this point when analyzing the survey data.

Given that the decision to apply for a highly selective fellowship is mostly relevant for students with the highest grades, it is important to gauge the differences in application rates between men and women at the top tail of the GPA distribution. We start from each student's raw GPA (on a 0-10 scale with a passing grade of 5). As shown in the top panel of Table C.16, average grades are lower in STEM (6.79) than in other disciplines (ranging from 6.99 in Social Sciences to 7.47 in Health & Life Sciences). In addition, on average women's GPA is 4% higher than men's, although the gender gap is practically non-existing in all fields except for Social Sciences. Because grades distributions vary across fields, we compute each individual's position in the GPA distribution corresponding to *his or her major and university*. We then pool all students and compare the resulting distributions for men and women.

Figure 1 plots the gender-specific percentile GPA distributions pooling all fields of study across all universities (but defining percentiles separately by university and major). More specifically, we plot the density of students (by gender) by 5 percentage-point brackets across the whole range of GPA percentiles (based on the combined distribution of males and females). The Figure clearly shows that women are greatly under-represented at the bottom of the grades distribution and also slightly under-represented at the top. Figure 2 plots the difference between the two distributions at each percentile bracket. Below the 35th percentile, the density of women is always below the density of men, for as much as 1.5 percentage points (in the first bracket). Between the 35th and 95th percentiles, women are over-represented relative to men. However, women are under-represented at the top bracket (percentiles 95-100) by about 0.2 percentage points (see also Appendix B). Because the LCF fellowships are highly selective, the relative scarcity of women at the very top of the GPA distribution could account for an important chunk of the application gender gap.[21]

[21] Section B.2 contains an alternative method for comparing the GPA of men and women along the whole distribution based on standardizing each student's GPA on the basis of the mean and standard deviation of his/her major and university. That method is less demanding in terms of data but makes distributional assumptions. At any rate, the qualitative conclusions coincide with what we just discussed. In a quantitative sense, the alternative method suggests a larger gender gap at the top 5% of

In conclusion, when we pool the administrative GPA records across all universities we observe that women have higher GPA than men *on average* but are slightly under-represented among students with grades above the 95th percentile. The regression analysis in the next section will quantify how important this factor is in accounting for gender differences in applications to the fellowship program.

# 4 The decision to apply

Importantly, for one of the universities (the UB) we were allowed to merge the individual graduation records with the LCF applications dataset. Thus, we are able to use regression analysis to quantify the determinants of the decision to apply to the fellowship program and to estimate the *conditional* gender gap in application net of differences in observables (including age and family background).

It is worth noting that the UB is the largest university in Catalonia in terms of enrollment, accounting for approximately one third of the college population in the whole region. Let us begin by providing some basic descriptive statistics (Table C.14). Women are as likely as men to be between the 90th and 95th percentiles of their major GPA distribution. However, they are 0.23 percentage points less likely to be in the top 5% of their major's grade distribution than men (although we cannot reject the hypothesis of equal values). In addition, female graduates at UB are 9.4 percentage points less likely to be in STEM and 8.5 percentage points more likely to be in Health. These observations will resonate in the regression analysis presented later.[22]

It is also interesting to examine the bottom panels of Table 1, which report the aggregate application rates for the UB and the other institutions. The data show that the rate is lower at the UB (1.07% for both genders combined) than at the other three universities, partly due to its higher specialization in Social Sciences.[23] In addition, the female-male participation ratio (pooling all fields) for the UB is estimated to be 0.90,

the GPA distribution (Table C.16).

[22]The Table also shows that female UB graduates are 0.8 years younger than men and are 5.6 percentage-points less likely to have at least one college-educated parent. The latter finding is not surprising given that the average SES of men and women is the same in the population at large, but men are more highly selected among the college-going population (where they account for 1/3 of the student body).

[23]Within Social Sciences, the participation rate is substantially lower at the UB (0.33%) than at the other institutions (where it ranges between 1.31% and 2.17%). This within-field gap may reflect differences in major composition *within* Social Sciences, in addition to differences in selectivity or institutional support to students seeking to pursue graduate studies abroad.

revealing a substantial gender gap that largely reflects its relatively small STEM share.

Next, we explore the factors that determine the decision to apply for an LCF fellowship using the UB-FLC matched dataset. Specifically, we estimate a linear probability model for participation in the fellowship program and analyze the roles played by GPA (and the relative position in the grade distribution of one's major), field of study, gender and socio-economic status. Naturally, the estimation is restricted to the uncensored cohorts (2012-2014) which entails a sample size of slightly over 18,000 graduates.

The bottom of column 1 in Table 3 shows that the mean application rate for the estimation sample is 1.04%, which is very close to the 1.07% reported in Table 1, but the unconditional gender gap is larger in the estimation sample (FM ratio 0.79) than what we reported in Table 1 (FM ratio 0.90) due to differences in the samples.[24] At any rate, the female application rate in the estimation sample is 0.25 percentage points lower than the corresponding value for males (with a standard error of 0.16).

When we include controls for field of study and individual characteristics (column 2), the estimates show large significant effects of parental education (positive) and age (negative). College-educated parents may be more effective in shaping the academic and professional aspirations of their children. In turn, age negatively affects the probability of applying because it captures when an individual student took longer to graduate (or experienced grade repetition in primary or secondary education).

Column 2 also reveals important differences across fields in the propensity to apply to the program. The highest application rates are found in STEM, followed by Health, whereas the lowest value is found in Social Sciences.[25] We also learn that controlling for field of study reduces the gender gap to 0.11 percentage points (down from 0.25) because of the female under-representation in STEM and over-representation in Social Sciences, respectively, the fields with the highest and lower application rates.

Column 3 controls for GPA. Not surprisingly, GPA has a positive and significant coef-

[24] The discrepancy in the female-male application ratio stems from two reasons. First, we lack information on parental education for 10% of the UB-FLC graduates. Second, some students have multiple majors and this introduces a discrepancy between the year of graduation in their UB records and in their FLC applications. In the estimation sample we chose to rely on the most recent year of graduation according to university records (whereas the aggregate application rates in Table 1 employ the information in the FLC applications). In both cases, the gender gap increases relative to Table 1. When we use the information on graduation year from the FLC applications for the students with multiple majors, the resulting female-male application ratio becomes 0.84, substantially closer to the 0.90 reported in Table 1. The remaining discrepancy is due to the individuals that lack information on parental education.

[25] Based on our preferred specification (column 5), the mean application rate is 2.7 percentage-points higher in STEM than in Social Sciences.

ficient in regards to the probability to apply for a LCF fellowship. Moreover, controlling for GPA increases the gender gap to 0.39 percentage points. The increase is due to the fact that women have lower application rates despite having *higher* GPA than men on average (7.3 versus 7.1 in a 0-10 scale). Because the LCF program is highly selective, a disproportionate number of applications are made by the students with the highest GPA in each graduating cohort. This requires a more in-depth analysis of the role of GPA as a determinant of participation in the program. As we saw earlier, women were slightly under-represented in the top 5% of the GPA distribution of the corresponding majors.[26]

Because application rates in the LCF program increase strongly with GPA, it is important to experiment with econometric specifications that control more flexibly for GPA. Accordingly, column 4 in Table 3 includes dummy variables for all the 5-point percentile brackets above the median, in addition to GPA.[27] Two observations stand out. First, only the coefficients for the brackets above the 85th percentile are significantly different from zero, which shows that controlling for GPA in a linear fashion is a parsimonious parametric restriction across most of the GPA distribution, but is rejected by the data at the very top range of grades. Second, the gender gap falls slightly to 0.27 percentage-points because of the relatively lower share of women with very high grades.

Column 5 presents our preferred specification, which reduces the number of coefficients by allowing discontinuities in the GPA function only above the 85th percentile. This specification confirms the gender gap found in column 4 (estimated at 0.27 percentage points). The estimates also imply that students with grades in the top 5 percent of their major are 4.1 percentage-points more likely to apply to the fellowship.[28] The estimates imply that having two college-educated parents is associated with a 1.5 percentage-point increase in the probability to apply for the fellowships. Naturally, having a single parent with college education has a smaller effect, increasing this probability by 0.5 percentage points. Last, column 6 shows that the estimated gender gap is ro-

[26]This fact was established in the dataset pooling all universities. However, the same pattern is also found when we restrict to UB graduates (as seen in column 7 in Table C.15).

[27]Our specification is similar to the one used by Dillon and Stmith (2020) in their analysis of ability sorting in college choice and the resulting effect on student outcomes.

[28]The specification in column 5 implies the following relationship between GPA and probability to apply. Up to the 80th percentile of GPA, the participation probability increases linearly. Discontinuous jumps are allowed at the 80th, 85th, 90th and 95th percentiles, with magnitudes estimated by the corresponding coefficients (whose values are always in reference to the mean participation rate below the 80th percentile). Within each of the brackets 80-85th percentiles through 95-100th percentiles, the marginal effect of GPA is linear and has the same slope as the below the 80th percentile, which is captured by the coefficient of the GPA variable.

bust to a completely different way of modeling the relationship between GPA and the propensity to apply to the fellowships, namely, by considering a third degree polynomial.

Table 4 provides additional insights on the decision to apply. First, the size of the gender gap increases as we restrict to increasingly higher GPA subsamples, both as a difference and in relationship to the mean participation rate (from $0.27/1.04 = 26\%$ for the whole sample to roughly 32% and 39% above the 75th or 90th GPA percentiles, respectively). Additionally, columns 4 and 5 estimate our preferred specification separately for STEM and non-STEM graduates. The estimates reveal no evidence of a gender gap in STEM (after controls and fixed-effects), where the coefficient on the female dummy is actually positive (0.59). Instead, the gender gap arises in the non-STEM fields.[29]

Summing up, our estimates reveal that many factors shape the decision to apply to the fellowship program. Among these, academic ability (measured by grades) and field of study play the key roles in a quantitative sense. The estimates in this section are also helpful in estimating the *conditional* female-male application ratio, which is found to be around 0.78 (and 0.74 in the high-GPA sample). Thus, we conclude that female application rates among UB graduates are 22% (26% in the high-GPA sample) lower than the corresponding value for males graduating with the same GPA, age, socio-economic status, and graduating in the same field of study, cohort and university. While we cannot be totally certain, it is likely that this conclusion applies to the other universities as well (with the exception of the engineering school).

# 5 Interest in graduate studies

The goal of the LCF program (and others like it) is to provide fellowships to attend the world's best graduate programs. Besides an excellent academic record and an interest in graduate studies, attending these programs often requires willingness to move to another country. The lower female application rates could be explained by a variety of factors: compared to similar men, female college graduates may be less interested in graduate studies (and more interested in immediately seeking employment after college) because of lower expected returns to the investment in a general sense. Also stronger preferences for children and family may deter women from choosing more ambitious educational

[29] Unfortunately, subdividing the non-STEM category by field (Health, Arts & Humanities and Social Sciences) is not informative due to small sample sizes (columns 6-8). Table C.17 provides a decomposition of the contribution of each of the factors included in the regression model in explaining the gender gap in the decision to apply for the fellowship.

plans (Wiswall and Zafar (2021)). As in the labor market context, the lower geographical mobility of women could also affect gender differences in educational aspirations (Le Barbanchon et al. (2019) and Petrongolo and Ronchi (2020)). To investigate the contribution of these alternative explanations we turn to a novel survey that collects the post-graduate intentions of college students in Spain.

In January and February 2020, we surveyed all students at the four universities participating in our study that had completed over half of the credit hours required for graduation. We gathered almost 5,000 complete questionnaires in total. The data show that 80% of students intend to enroll in graduate school, studying a Master's degree (70%) or a Ph.D. (10%). At the same time, the majority (70%) also consider seeking employment immediately after graduation. Presumably, their eventual choices will depend on labor market conditions and on their success in gaining admission to their preferred graduate programs. The survey contains a wealth of information to understand the perceived costs and benefits for the alternatives in students' choice sets.

Table 5 presents summary statistics, comparing men and women for the whole sample and the subsample with high grades.[30] The Table is largely in agreement with the administrative data discussed earlier. Specifically, female students are substantially under-represented in STEM majors (by 36 percentage-points). They are also slightly younger than men and have lower socio-economic status, measured by parental education. In regards to academic achievement, the survey data show that women have slightly higher GPA, on average, than men, but are 4 percentage-points less likely to be in the top 10% by GPA.[31]

When asked about their interest in graduate studies, Table 5 shows that male and female students are equally interested in pursuing a Master's degree after graduation. Specifically, around 69% of them are considering this path, and the rate increases to 71% if we restrict to students with high GPA (above the 75th percentile). In contrast, women are significantly less interested in doctoral programs than men. While 12% of male students would like to pursue a Ph.D., the rate for women is 3.7 percentage points lower. As expected, GPA is an important determinant of interest in doctoral studies. About 23% of male students with GPA above the 75th percentile are interested in this

[30] We consider two thresholds: *GPAHigh1* are students with GPA above 7.8, which corresponds to the average 75th percentile across all fields of study in administrative data. Similarly, we define *GPAHigh2* as an indicator for students with GPA above 8.3, which corresponds to the average 90th percentile across all fields of study.

[31] Almost 20% of our sample reports grades above the 90th percentile because high-achieving students are more likely to respond to the survey.

option, but the corresponding rate is 10 percentage points lower among female students with high grades.

To examine whether these gender differences are driven by differences in individual characteristics, we now estimate a series of linear models that control for GPA, socio-economic status and field of study. The results are collected in Columns 1-4 in Table 6. Beginning with the full sample (top panel), Column 1 shows that there are practically no differences between men and women in their interest in graduate studies. The picture is practically unaffected when we include the controls listed earlier (Column 2), which show that GPA and high SES are significant determinants of interest in post-graduate studies. Columns 3 and 4 restrict the sample to students interested in graduate studies (which make up 72% of the sample). Interestingly, while females are as likely as males to be interested in a Master's degree, they are 8 percentage-points less likely to be interested in doctoral studies. The bottom panel restricts the sample to students with (self-reported) GPA above the 75th percentile. The estimates confirm the same pattern for the sample of students with high GPA. Naturally, these students are more interested in doctoral studies because of their stronger academic ability. Among talented students, the gender gap in interest in Ph.D. grows to 13 percentage points.

In sum, the data clearly reveal that female college students are much less interested in doctoral studies than their male counterparts, whereas interest in Master's degrees is practically the same for male and female students.

Let us know turn to examine students' preferences over the location of their preferred graduate program. We begin this exploration by examining students' responses to a survey question regarding their intention to apply to competitive fellowship programs to study abroad.[32] As we can see in column 5, 17% of college students with an interest in graduate studies intend to apply for one of these fellowships, with this value increasing to 28% among students with GPA above the 75th percentile. Columns 6 and 7 show that the gender gap in intention to apply to these fellowships exists both among students interested in Master's programs and for those with an interest in doctoral studies. Because these fellowships primarily fund studies abroad, the gap in the intention to apply for these fellowships may reflect gender differences in the preference to study abroad (particularly in regards to the gap among students interested in Master's degrees). We dig deeper on this issue in the next section.

[32] The survey question lists the most well known graduate fellowship programs in Spain: LCF, Fulbright, Ramon Areces and Rafael del Pino. Among the students in our survey, the LCF is, by far, the most well known graduate fellowship program and is also the largest in scope and budget.

## 6 Gender disparities in geographical mobility

Our survey asked students for the geographic location of their preferred graduate program. As shown in Table 7 (column 1), the majority of male and female students (61%) reported preferring a program located in the province where they currently reside.[33] About 11% of male students (and 15% of women) were considering programs in another province within Spain. However, while 28% of men report planning to attend graduate school abroad, the corresponding value for women was 3.5 percentage points lower. Thus, among students planning to attend graduate school after graduating from college, women appear to be less willing to attend a foreign institution.

The survey also asked students about the location of their preferred graduate program in a *hypothetical* scenario where they did not face any *economic or family constraints*.[34] As shown in the second column of Table 7, students' 'unconstrained' choices would be dramatically different. The share of male students that would choose to study abroad would be 32 percentage-points higher. Among women, the increase in the corresponding share is 3 percentage-points higher than for men. In other words, the underlying preference for studying at a foreign institution seems to be the same for male and female students. However, economic or family restrictions constrain women more than men in terms of their geographical mobility. Below we try to shed light on the relative importance of economic constraints versus family ties. We note that our analysis in this section is purely descriptive, but we believe it is still useful to investigate which mechanisms may be at play.

From the viewpoint of human capital theory, there are several reasons that could explain the gender differences in the type and location of graduate studies. Students' educational choices are based on the net discounted utility gain from each of the available choices. Next, we follow the literature and examine some of the factors that are more likely to differentially affect the calculations of male and female students regarding graduate programs. It is also worth noting that doctoral studies entail a larger human capital investment than master's programs due to their much longer duration, which delays the entry into the labor market (and raises the opportunity cost) and may also affect the timing of family formation.

[33] The universities included in our study are located in the Barcelona metropolitan, which offers a wide variety of options for graduate studies.

[34] The exact wording of the question is the following: "In the absence of family and economic constraints, your preference would be to carry out graduate studies in (i) the current province of residence, (ii) in another province (within Spain), (iii) in another European country, or (iv) outside of Europe.

Compared to similar male students, female students may 1) expect lower future earnings, 2) have a higher preference for children and family, or 3) may discount future payoffs more heavily, or be more risk averse. These factors could contribute to explain the lower interest in more costly educational investments among female college students, interpreting costs in a wide sense that includes both monetary as well as utility costs. Our data allows us to examine gender differences along these dimensions.

In the survey, we ask students about their earnings expectations. As shown in Column 1 of Table 8, women expect lower earnings than comparable men. The gap ranges from 16 log points (full sample) to 9 log points (high GPA sample), consistent with estimates of the wage gender gap in the labor market. Hence, the lower expected earnings by women may play a role in explaining their lower interest in investing in graduate studies and, particularly, in multi-year doctoral programs.

Regarding preferences for family formation, while we do not uncover gender differences in the expected number of children (Column 2), we find evidence that female students would like to begin having children at an earlier age (1.2 to 1.3 years before) than men with similar characteristics. Thus differences in biological constraints could also contribute to women's lower interest in doctoral studies.

We also examine differences in time (and risk) preferences. If female college students discount consumption more heavily than men, they will shun long graduate programs with payoffs that are delayed in time, preferring Master's over Ph.D. programs. Our survey has a number of questions aimed at eliciting the time discount factor for each individual.[35] Using the answers to these questions, we built a *patience index* that ranges between 1 (lowest patience) and 32 (highest patience). As shown in Column 4 in Table 8, women appear to have less patience (i.e. higher time discounting) than comparable men, which is also consistent with their lower interest in doctoral studies. The survey also included questions to elicit risk preferences. Unfortunately, the response rate was very low and this may explain why we do not uncover any gender differences along this dimension (Column 5).

Another possible explanation that could explain why female college students appear to have a greater preference for geographical proximity is that studying away from home is more expensive that attending a local institution, which may permit living at home. As discussed earlier, female students expect lower earnings in the future, which lowers

[35] We adopted the approach described in Falk et al. (2018), consisting in presenting students with a sequential hypothetical decisions between monetary payoffs of different amount in the present and in the future. These approach is widely used and has been validated by the authors in an experimental setting. We followed the same approach to elicit risk preferences.

the net present value of more costly educational investments. Furthermore, moving to a distant city or to another country is also costly in non-pecuniary terms. It entails a reduction in direct contact with one's family and likely reduces the ability to contribute to home production through one's time (e.g. by taking care of younger siblings or elderly relatives) during the duration of the graduate program.

In order to explore the role of family more deeply, we build three measures of family ties: weekly hours providing care for siblings or elderly relatives, and indicators for currently being in a relationship or cohabitating (with a romantic partner). In the survey, around 55% of male and female students report providing care for siblings or older relatives (Table 5). However, conditional on providing care, women report spending more hours than men in this task. More specifically, the mean number of care hours is 10.7 per week (conditional on caregiving). But women providing care report spending 1.5 hours more, on average, than men. In addition, 40.8% and 7.4% of men report being in a relationship or co-habitating, respectively, while the corresponding rates for women are 9.5 and 1.8 percentage points higher. Thus, female college students are more likely to have significant family ties than their male counterparts. It is worth noting that our measures are based on family ties during college, whereas the gender gap literature has mostly focused on family responsibilities during individuals' working lives.We argue that gender differences in *post-graduate* educational choices contributes to the glass ceiling in the labor market.

Next, we use regression analysis to examine the roles played by the factors discussed in the paragraphs above in accounting for gender disparities in the intention to conduct graduate studies *abroad* (conditional on having stated an interest in graduate studies). The results are collected in Table 9. Beginning with the full sample of students interested in graduates studies (top panel), columns 1 and 2 confirm that the there is no statistically significant difference between men and women in the probability to want to study abroad in the hypothetical 'unconstrained' scenario (Column 1). However, given actual constraints, female college students are 5 percentage-points less likely to want to study abroad than males (Column 2). Column 3 shows that GPA and high SES have a large, positive effect on the desire to study abroad. In addition, the estimated gender gap in the preference to study abroad falls by about half its size (to 2 percentage-points) when we control for individual characteristics and fixed-effects (university and field of study).

Column 4 explores the role of economic factors, time preferences and future family expectations. Higher expected earnings appear to have a positive effect on the preference to study abroad. This result is consistent with the predictions of the standard human capital investment model: students with a higher earnings potential are more likely to find it worthwhile to study abroad, which is more costly than studying at a domestic institution. The estimates in this column also show that higher patience correlates with the preference to study abroad, which may be particularly relevant for those students interested in doctoral studies. Finally, students planning to have a higher number of children appear to be less interested in studying abroad, which may signal greater labor market ambitions. These estimates, combined with the earlier findings showing that women expect lower future earnings, have a lower patience index and would like to start families (i.e. having children) sooner than men, contribute to explain female students' lower intention to study abroad.

Column 5 in Table 9 turns to the role played by *current* family ties. The estimates show that individuals providing more care hours and those reporting being in a relationship are less likely to intend to study abroad, other things equal. Because female students provide more hours of care and are more likely to be in a relationship, family ties disproportionately reduce their geographical mobility relative to male students. Finally, Column 6 introduces simultaneously all the explanatory variables considered here, confirming the statistical significance of the factors just discussed.

All in all, our interpretation of the survey-based findings described here is that, on average, female college students make less ambitious educational choices than similar men. Specifically, conditional on planning to attend graduate school, female students appear to be more *geographically* constrained, in the sense of having a lower preference to study at a foreign institution. Furthermore, these constraints likely reflect gender differences in expectations regarding earnings and family plans in the future (as in Wiswall and Zafar (2021)), along with stronger family ties *in the present*.

# 7 Conclusions

Strong credentials, such as advanced degrees from renowned universities, help gain access top positions in the private and public sectors (including academia). At the same time, it is well established that women remain under-represented in high-status positions in the labor market and also in prestigious graduate programs across many fields of study.

Our paper analyzes the academic aspirations of male and female college graduates using proprietary data on applications to a program aimed at funding graduate students abroad for candidates with excellent academic qualifications, combined with administrative data on graduation rates and a new large survey on college students about their post-graduation plans.

Our analysis shows that students with higher grades are much more likely to intend to pursue graduate studies abroad and to seek funding from competitive fellowship programs. We also find that female college students are less likely to seek funding to study abroad than comparable men, even though this gap disappears when they are asked to consider a hypothetical scenario where they did not face economic or family constraints.[36] Thus, these factors constrain the geographical mobility of female college students and lower their educational aspirations in a quantitatively important manner. Our survey data show that 68% of female college students are interested in graduate studies and that 60% of these women would like to study abroad in the absence of economic and family constraints. However, when female college students take into account the actual constraints they face, only 24% of those interested in graduate studies consider studying abroad is feasible for them.

Our survey data provide evidence for the factors that lead to lower geographical mobility of female college students. We show that females expect lower future earnings and have a higher preference for children, which has been shown to shape educational choices among college students (Wiswall and Zafar (2021)). We also document that women have stronger family ties *in the present*, measured by the time spent caring for relatives and commitment to ongoing romantic relationships. The latter finding is novel and sheds additional light on why female college students appear to make less ambitious educational choices than their male counterparts. It also highlights some potential implications of the common ways in which boys and girls are socialized.

[36]Interestingly, the gender gap in post-graduate educational aspirations is reversed among college students in STEM fields. Our survey data show that STEM women differ systematically from other female college students along a variety of dimensions. In particular, their parents are more likely to be college-educated, they have higher earnings aspirations, higher academic ability (measured by college-entry grades) and are more interested in graduate studies abroad than female students in other majors.

# References

Azmat, Ghazala and Katja Kaufmann, “Formation of College Plans: Expected Returns, Preferences, and Adjustment Process,” Technical Report, Mimeo Sciences Po 2021.

_ and Rosa Ferrer, “Gender Gaps in Performance: Evidence from Young Lawyers,” *Journal of Political Economy*, 2017, *125* (5), 1306–1355.

_ , Vicente Cuñat, and Emeric Henry, “Gender Promotion Gaps: Career Aspirations and Workplace Discrimination,” 2020.

Bagues, Manuel F. and Berta Esteve-Volart, “Can Gender Parity Break the Glass Ceiling? Evidence from a Repeated Randomized Experiment,” *Review of Economic Studies*, 2010, *77* (4), 1301–1328.

Barbanchon, Thomas Le, Roland Rathelot, and Alexandra Roulet, “Gender differences in job search: Trading off commute against wage,” *Available at SSRN 3467750*, 2019.

Bayer, Amanda and Cecilia Elena Rouse, “Diversity in the Economics Profession: A New Attack on an Old Problem,” *Journal of Economic Perspectives*, Fall 2016, *30* (4), 221–242.

Bertrand, Marianne, “Career, family, and the well-being of college-educated wom-en,” *American Economic Review*, 2013, *103* (3), 244–50.

_ and Kevin F Hallock, “The gender gap in top corporate jobs,” *ILR Review*, 2001, *55* (1), 3–21.

_ , Sandra E Black, Sissel Jensen, and Adriana Lleras-Muney, “Breaking the Glass Ceiling? The Effect of Board Quotas on Female Labour Market Outcomes in Norway,” *Review of Economic Studies*, 2019, *86* (1), 191–239.

Bielby, William T. and Denise D. Bielby, “I Will Follow Him: Family Ties, Gender-Role Beliefs, and Reluctance to Relocate for a Better Job,” *American Journal of Sociology*, 1992, *97* (5), 1241–1267.

Black, Dan A, Amelia M Haviland, Seth G Sanders, and Lowell J Taylor, “Gender wage disparities among the highly educated,” *Journal of human resources*, 2008, *43* (3), 630–659.

Blau, Francine D. and Lawrence M. Kahn, “The Gender Wage Gap: Extent, Trends, and Explanations,” *Journal of Economic Literature*, September 2017, *55* (3), 789–865.

Boustan, Leah and Andrew Langan, “Variation in Women’s Success across PhD Programs in Economics,” *Journal of Economic Perspectives*, Winter 2019, *33* (1), 23–42.

Breda, Thomas and Son Thierry Ly, “Professors in Core Science Fields Are Not Always Biased against Women: Evidence from France,” *American Economic Journal: Applied Economics*, October 2015, *7* (4), 53–75.

Bursztyn, Leonardo, Thomas Fujiwara, and Amanda Pallais, “’Acting Wife’: Marriage Market Incentives and Labor Market Investments,” *American Economic Review*, November 2017, *107* (11), 3288–3319.

Buser, Thomas, Muriel Niederle, and Hessel Oosterbeek, “Gender, competitiveness, and career choices,” *The Quarterly Journal of Economics*, 2014, *129* (3), 1409–1447.

Cortes, Patricia, Jessica Pan, and Anna Sjogren, "Reaching for the Top: Gender Differences in the Labor Market and Household Outcomes of Top Talent in Sweden and the United States," Technical Report 2020.

Dillon, Eleanor W. and Jeffrey A. Stmith, "The Consequences of Academic Match between Students and Colleges," *The Journal of Human Resources*, Summer 2020, *55* (3), 767–808.

Ellison, Glenn and Ashley Swanson, "The gender gap in secondary school mathematics at high achievement levels: Evidence from the American Mathematics Competi-tions," *Journal of Economic Perspectives*, 2010, *24* (2), 109–28.

Falk, Armin, Anke Becker, Thomas Dohmen, Benjamin Enke, David Huffman, and Uwe Sunde, "Global Evidence on Economic Preferences," *The Quarterly Journal of Economics*, 2018, *133* (4), 1645–1692.

Farré, Lídia and Francesc Ortega, "Selecting Talent: Gender Differences in Participation and Success in Competitive Selection Processes," IZA Discussion Papers 12530, Institute of Labor Economics (IZA) 2019.

Fluchtmann, Jonas, Anita M. Glenny, Nikolaj Harmon, and Jonas Maibom, "The Gender Application Gap: Do men and women apply for the same jobs?," Technical Report 2020.

Fortin, Nicole M., Philip Oreopoulos, and Shelley Phipps, "Leaving Boys Behind: Gender Disparities in High Academic Achievement," *Journal of Human Resources*, 2015, *50* (3), 549–579.

Garcia-Montalvo, Jose, *Impacto de las becas 'La Caixa' de posgrado en el extranjero*, Obra Social 'la Caixa', 2014.

Goldin, Claudia, Lawrence F Katz, and Ilyana Kuziemko, "The homecoming of American college women: The reversal of the college gender gap," *Journal of Economic perspectives*, 2006, *20* (4), 133–156.

Hedges, LV and A Nowell, "Sex differences in mental test scores, variability, and numbers of high-scoring individuals," *Science*, 1995, *269* (5220), 41–45.

Hospido, Laura and Carlos Sanz, "Gender Gaps in the Evaluation of Research: Evidence from Submissions to Economics Conferences," IZA Discussion Papers 12494, Institute of Labor Economics (IZA) July 2019.

_ , Luc Laeven, and Ana Lamo, "The gender promotion gap: evidence from central banking," 2019.

Hsieh, Chang-Tai, Erik Hurst, Charles I Jones, and Peter J Klenow, "The allocation of talent and US economic growth," *Econometrica*, 2019, *87* (5), 1439–1474.

Jürges, Hendrik, "Gender ideology, division of housework, and the geographic mobility of families," *Review of Economics of the Household*, 2006, *4* (4), 299–323.

Keloharju, Matti, Samuli Knüpfer, and Joa cim Tåg, "What Prevents Women from Reaching the Top?," 2019.

Montalban, Jose and Almudena Sevilla, "The gender gap in student performance: the role of test-taking environment," Technical Report 2020.

Niederle, Muriel and Lise Vesterlund, "Do women shy away from competition? Do men compete too much?," *The Quarterly Journal of Economics*, 2007, *122* (3), 1067–1101.

Paredes, Valentina A., M. Daniele Paserman, and Francisco Pino, "Does Economics Make You Sexist?," NBER Working Papers 27070, National Bureau of Economic Research, Inc May 2020.

Petrongolo, Barbara and Maddalena Ronchi, "Gender gaps and the structure of local labor markets," *Labour Economics*, 2020, p. 101819.

Rouse, Cecilia and Claudia Goldin, "Orchestrating Impartiality: The Impact of 'Blind' Auditions on Female Musicians," *American Economic Review*, September 2000, *90* (4), 715–741.

Shauman, Kimberlee A. and Yu Xie, "Geographic mobility of scientists: Sex differences and family constraints," *Demography*, 1996, *33* (4), 455–468.

Wallen, Aaron S., Michael W. Morris, Beth A. Devine, and Jackson G. Lu, "Understanding the MBA Gender Gap: Women Respond to Gender Norms by Reducing Public Assertiveness but Not Private Effort," *Personality and Social Psychology Bulletin*, 2017, *43* (8), 1150–1170. PMID: 28903718.

Wiswall, Matthew and Basit Zafar, "Human capital investments and expectations about career and family," *Journal of Political Economy*, 2021, *129* (5), 1361–1424.

Table 1: Aggregate Application Rates

| Gender | Uni | Counts Applications | Counts Grads | AR All Fields | AR STEM | AR Health | AR ArtsHum | AR Soc. Sci. |
|---|---|---|---|---|---|---|---|---|
| All cohorts | | | | | | | | |
| Both | All | 1,530 | 139,298 | 1.10 | 1.25 | 1.94 | 1.54 | 0.58 |
| Male | All | 715 | 64,081 | 1.12 | 1.17 | 2.21 | 1.46 | 0.67 |
| Fem. | All | 815 | 75,217 | 1.08 | 1.44 | 1.85 | 1.59 | 0.54 |
| Ratio F/M | All | 1.14 | 1.17 | 0.97 | 1.23 | 0.84 | 1.09 | 0.80 |
| Uncensored cohorts | | | | | | | | |
| Both | All | 815 | 49,107 | 1.66 | 1.84 | 3.41 | 2.20 | 0.87 |
| Male | All | 371 | 22,365 | 1.66 | 1.69 | 3.78 | 2.19 | 1.00 |
| Fem. | All | 444 | 26,742 | 1.66 | 2.22 | 3.28 | 2.21 | 0.80 |
| Ratio F/M | All | 1.20 | 1.20 | 1.00 | 1.31 | 0.87 | 1.01 | 0.80 |

**Notes:** The application rate is the number of ever applicants (by field-university-gender cell) over the size of the corresponding graduating cohort, or analogous ratios at lower levels of aggregation. The top panel reports data using all cohorts. The bottom panel panel uses uncensored cohorts only (graduation in academic years 2012-2013 through 2014-2015). *All* refers to the four universities (UB, UAB, UPC and UPF) pooled together.

Figure 1: GPA distributions by gender. All universities pooled

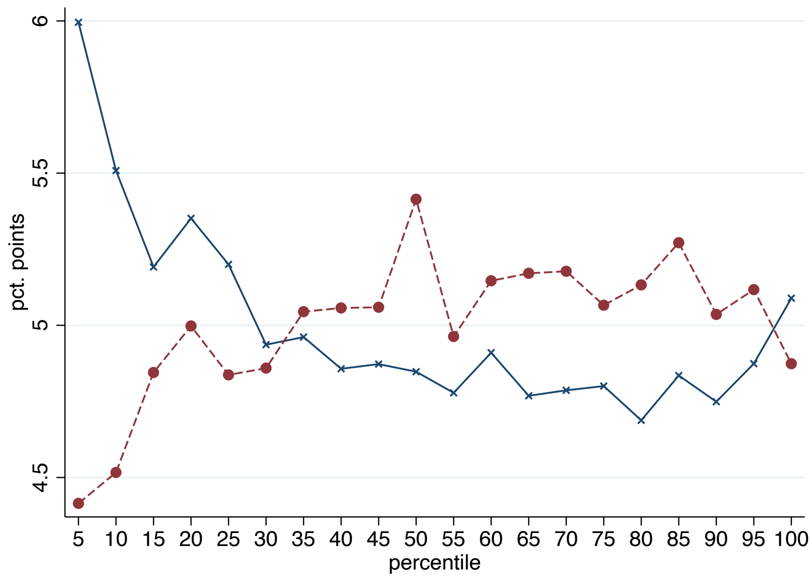
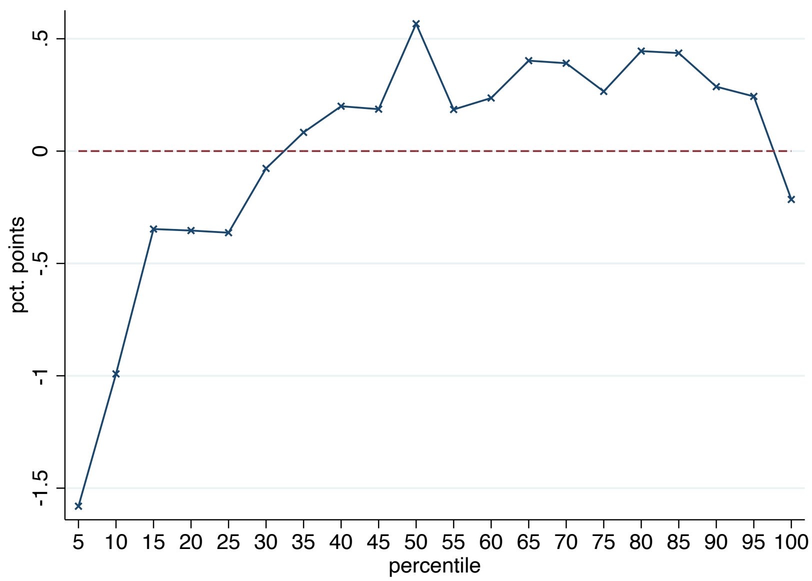



Figure 2: Difference in probability density female - male




**Notes:** Data for the 4 universities for graduation cohorts 2009-2018 for a total of 161,597 individual records. GPA at graduation administrative records. Each individual data point has been placed in the percentile bracket corresponding to the GPA distribution in its own major and university. The bottom figure plots the difference between the two lines plotted in the top figure (female minus male values).

Table 2: Application Rates to the Fellowship Program by type of degree and location of graduate program

| Gender | All | Master Abroad | PhD Abroad | PhD Spain |
|---|---|---|---|---|
| Both | 1.66 | 0.87 | 0.28 | 0.51 |
| Male | 1.66 | 0.85 | 0.31 | 0.49 |
| Fem. | 1.66 | 0.89 | 0.25 | 0.52 |
| FM ratio | 1.00 | 1.04 | 0.81 | 1.06 |

**Notes:** Pooled data for the 4 universities (all fields pooled) Uncensored cohorts only (2012-2014). LCF applications for rounds 2014-2018.

Table 3: Application regressions. Matched UB-FLC Data

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Female | -0.25 | -0.11 | -0.39** | -0.27* | -0.27* | -0.25 |
| | [0.16] | [0.16] | [0.16] | [0.16] | [0.16] | [0.16] |
| GPA | | | 1.61*** | 0.90*** | 0.85*** | 120.28*** |
| | | | [0.11] | [0.18] | [0.14] | [21.41] |
| $GPA^2$ | | | | | | -17.41*** |
| | | | | | | [2.87] |
| $GPA^3$ | | | | | | 0.84*** |
| | | | | | | [0.13] |
| $85-90$ perc. | | | | 0.65 | 0.78** | |
| | | | | [0.40] | [0.36] | |
| $90-95$ perc. | | | | 0.89** | 1.02*** | |
| | | | | [0.43] | [0.38] | |
| $>95$ perc. | | | | 3.95*** | 4.11*** | |
| | | | | [0.48] | [0.41] | |
| Age | | -0.07*** | -0.08*** | -0.08*** | -0.08*** | -0.08*** |
| | | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] |
| College parent2 | | 1.66*** | 1.64*** | 1.54*** | 1.55*** | 1.48*** |
| | | [0.20] | [0.20] | [0.20] | [0.20] | [0.19] |
| College parent1 | | 0.44** | 0.49** | 0.47** | 0.46** | 0.40** |
| | | [0.19] | [0.19] | [0.19] | [0.19] | [0.19] |
| STEM | | 2.72*** | 2.76*** | 2.73*** | 2.74*** | 2.66*** |
| | | [0.29] | [0.29] | [0.29] | [0.29] | [0.29] |
| Health | | 1.32*** | 0.90*** | 1.06*** | 1.08*** | 0.96*** |
| | | [0.20] | [0.20] | [0.20] | [0.20] | [0.20] |
| ArtsHum | | 1.15*** | 0.63*** | 0.87*** | 0.89*** | 0.61*** |
| | | [0.21] | [0.21] | [0.22] | [0.22] | [0.21] |
| Observations | 18,195 | 18,195 | 18,195 | 18,195 | 18,195 | 18,195 |
| Brackets 50p-80p | no | no | no | yes | no | no |
| Mean dep (%) | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 | 1.04 |
| Mean Dv Male | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 |
| Mean Dv Fem | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| FM ratio uncond. | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 | 0.79 |

**Notes:** The dependent variable is a dichotomous variable taking value of 0 or 100. The latter indicates that the individual applied to the FLC Fellowship program (in any year). The sample contains only uncensored cohorts corresponding to academic years 2012-2013 through 2014-2015 but about 5,000 observations lack socio-demographic observations (because they were transfer students). The GPA percentiles have been computed based on the administrative data for each major. Column 4 includes dummy variables for GPA percentile brackets 50-55 through 75-80, not shown for brevity (and none of those coefficients is statistically significant at 10%). Intercept and dummies for graduation cohort 2013 and 2014 included but not shown. The omitted categories are Soc. Sci. and graduation cohort 2012. The unconditional female-male (FM) ratio is simply the ratio of the mean PR for males to mean PR for females. Heteroskedasticity-robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Application regressions. Subsamples

| Sample | (1) All | (2) GPA>75p | (3) GPA>90p | (4) STEM | (5) Non-STEM | (6) Health | (7) ArtHum | (8) Soc |
|---|---|---|---|---|---|---|---|---|
| Female | -0.27* | -0.85 | -1.73* | 0.59 | -0.23 | -0.48 | -0.16 | -0.08 |
| | [0.16] | [0.52] | [1.03] | [0.93] | [0.15] | [0.51] | [0.46] | [0.12] |
| GPA | 0.85*** | 2.26*** | 4.39*** | 4.27*** | 0.80*** | 0.91** | 1.23*** | 0.10 |
| | [0.14] | [0.60] | [1.29] | [1.12] | [0.13] | [0.40] | [0.42] | [0.10] |
| $85-90$ perc. | 0.78** | 0.52 | | 5.26** | 0.28 | 1.14 | 2.36** | -0.14 |
| | [0.36] | [0.65] | | [2.57] | [0.34] | [1.08] | [1.13] | [0.26] |
| $90-95$ perc. | 1.02*** | 0.30 | | 1.55 | 0.68* | 2.39** | 1.85 | 0.09 |
| | [0.38] | [0.70] | | [2.59] | [0.36] | [1.09] | [1.14] | [0.28] |
| $>95$ perc. | 4.11*** | 2.69*** | 1.31 | 11.03*** | 2.98*** | 7.30*** | 5.67*** | 1.22*** |
| | [0.41] | [0.85] | [1.11] | [2.98] | [0.38] | [1.15] | [1.26] | [0.30] |
| Age | -0.08*** | -0.16*** | -0.23*** | -0.18 | -0.07*** | -0.19*** | -0.09*** | -0.02** |
| | [0.01] | [0.04] | [0.07] | [0.18] | [0.01] | [0.05] | [0.03] | [0.01] |
| College parent1 | 0.46** | 1.37** | 1.58 | -0.16 | 0.60*** | 0.46 | 1.06* | 0.27* |
| | [0.19] | [0.60] | [1.24] | [1.15] | [0.18] | [0.57] | [0.55] | [0.14] |
| College parent2 | 1.55*** | 2.69*** | 4.40*** | 3.58*** | 1.44*** | 1.97*** | 1.42** | 0.68*** |
| | [0.20] | [0.59] | [1.17] | [1.11] | [0.18] | [0.53] | [0.57] | [0.15] |
| STEM | 2.74*** | 7.72*** | 11.21*** | | | | | |
| | [0.29] | [0.92] | [1.90] | | | | | |
| Health | 1.08*** | 2.81*** | 4.18*** | | | | | |
| | [0.20] | [0.63] | [1.25] | | | | | |
| ArtsHum | 0.89*** | 2.66*** | 2.83* | | | | | |
| | [0.22] | [0.75] | [1.53] | | | | | |
| Obs. | 18,195 | 4,557 | 1,801 | 1,415 | 16,780 | 3,640 | 2,929 | 10,211 |
| Mean dep (%) | 1.04 | 2.66 | 4.39 | 3.32 | 0.85 | 1.87 | 1.47 | 0.30 |
| Mean Dv Male | 1.20 | 3.35 | 5.82 | 3.30 | 0.89 | 2.11 | 1.61 | 0.35 |
| Mean Dv Fem | 0.95 | 2.32 | 3.64 | 3.31 | 0.83 | 1.79 | 1.39 | 0.28 |
| Ratio F/M | 0.79 | 0.69 | 0.63 | 1.00 | 0.93 | 0.85 | 0.86 | 0.80 |

**Notes:** The dependent variable is a dichotomous variable taking value of 0 or 100. The latter indicates that the individual applied to the La Caixa Fellowship program (in any year). The sample contains only uncensored cohorts corresponding to academic years 2012-2013, 2013-2014 and 2014-2015. The GPA percentiles have been computed based on the administrative data for each major. Intercept and dummies for graduation cohort 2013-2014 and 2015-2015 included but not shown. The omitted categories are Social Sciences and graduation cohort 2012-2013. Heteroskedasticity-robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Survey. Descriptive statistics. All universities

| Sample | All | All | GPAhigh1 | GPAhigh1 |
|---|---|---|---|---|
| Gender | Men | Fem - Male | Men | Fem - Male |
| STEM | 0.585 | -0.361*** | 0.485 | -0.338*** |
| Health | 0.092 | 0.142*** | 0.135 | 0.093*** |
| ArtsHum | 0.064 | 0.108*** | 0.097 | 0.155*** |
| Soc. Sci | 0.236 | 0.123*** | 0.204 | 0.131*** |
| Age | 23.815 | -0.324*** | 23.765 | -0.235 |
| SES High Edu | 0.659 | -0.035*** | 0.731 | -0.011 |
| GPA | 7.057 | 0.188*** | 8.464 | -0.121*** |
| GPA high1 | 0.283 | 0.008 | 1.000 | 0 |
| GPA high2 | 0.192 | -0.041*** | 0.715 | -0.145*** |
| N. children | 0.032 | -0.007 | 0.042 | 0.008 |
| Care indicator | 0.556 | -0.011 | 0.511 | 0.026 |
| Care hours | 5.474 | 0.722*** | 4.641 | 1.487*** |
| Relationship | 0.408 | 0.095*** | 0.361 | 0.130*** |
| Cohabitates | 0.074 | 0.018** | 0.074 | 0.024 |
| Plans Master | 0.686 | 0.011 | 0.719 | -0.013 |
| Plans PhD | 0.122 | -0.037*** | 0.234 | -0.099*** |
| Asp. Hourly wage | 31.661 | -9.992*** | 25.510 | -4.018* |
| Asp. N. children | 1.844 | 0.028 | 1.822 | 0.02 |
| Asp. Age first child | 31.085 | -1.264*** | 31.247 | -1.251*** |
| Knows Fellowships | 0.705 | -5.157*** | 0.752 | -9.874*** |
| Intention Apply | 0.120 | -2.213** | 0.214 | -8.249*** |

**Notes:** The number of observations with non-missing data for gender, field of study and GPA is 4,848. Some of the variables above have missing observations. *GPAHigh1* restricts to students with GPA above 7.8 (in a 0-10 scale), which corresponds to the average 75th percentile across all fields of study in the administrative data when pooling all universities. In this case the sample size falls to 1,093 respondents (i.e. 22.5% of the 4,848 full sample). Similarly, we define *GPAHigh2* as an indicator for students with GPA above 8.3, which corresponds to the average 90th percentile. Caretaking hours are zero for 45% of the sample. The care hours reported include individuals providing zero hours. The *Plans* variables (referring to Master's degree and PhD) are not mutually exclusive. The mean caretaking hours, conditional on a positive value, is 10.7 hours per week. *Asp.* refers to aspirations. Monetary values are in Euros. Heteroskedasticity-robust standard errors. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 6: Survey. Interest in graduate studies.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Dep. Var. | PostGrad | PostGrad | Master | PhD | Apply | Apply | Apply |
| All GPA | | | | | | | |
| Female | 0.01 | 0.02 | 0.01 | -0.08*** | -0.04** | -0.04** | -0.08 |
| | [0.01] | [0.02] | [0.01] | [0.01] | [0.02] | [0.02] | [0.05] |
| GPA | | 0.04*** | -0.01*** | 0.07*** | 0.09*** | 0.09*** | 0.12*** |
| | | [0.01] | [0.00] | [0.01] | [0.01] | [0.01] | [0.03] |
| High SES | | 0.03** | -0.01* | 0.06*** | 0.05*** | 0.05*** | 0.08 |
| | | [0.01] | [0.01] | [0.01] | [0.02] | [0.02] | [0.05] |
| Observations | 3,899 | 3,848 | 2,782 | 2,782 | 1,886 | 1,829 | 320 |
| Mean depvar | 0.72 | 0.72 | 0.97 | 0.15 | 0.17 | 0.17 | 0.29 |
| GPA $> 75p$ | | | | | | | |
| Female | -0.02 | -0.01 | 0.02 | -0.13*** | -0.11** | -0.11** | -0.23*** |
| | [0.03] | [0.03] | [0.02] | [0.04] | [0.04] | [0.05] | [0.09] |
| GPA | | -0.00 | -0.05** | 0.17*** | 0.11** | 0.09* | 0.08 |
| | | [0.03] | [0.02] | [0.04] | [0.05] | [0.05] | [0.09] |
| High SES | | 0.03 | -0.01 | 0.03 | 0.10** | 0.10** | 0.16* |
| | | [0.03] | [0.01] | [0.03] | [0.04] | [0.04] | [0.09] |
| Observations | 953 | 902 | 684 | 684 | 487 | 466 | 128 |
| Mean depvar | 0.75 | 0.75 | 0.96 | 0.24 | 0.28 | 0.28 | 0.4 |
| Sample | All | All | PostGrad | PostGrad | PostGrad | Master | PhD |
| FE Field, Uni | No | Yes | Yes | Yes | Yes | Yes | Yes |

**Notes:** Sample restricted to students that reported parental education (used to generate the High SES dummy). In columns 2 and onward, we include indicators for university and broad field of study (STEM, Health & Life Sciences, Arts & Humanities and Social Sciences). Heteroskedasticity-robust standard errors. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Survey. Preferred post-graduate program abroad.

| | (1) Actual/Constrained Percent | (2) Unconstrained Percent | (3) Actual - Uncons. Percent |
|---|---|---|---|
| Males | | | |
| My province | 61.3 | 32.8 | -28.6 |
| Other province | 11.0 | 7.2 | -3.8 |
| Abroad | 27.7 | 60.1 | 32.4 |
| Europe | 21.2 | 35.6 | 14.4 |
| Outside Europe | 6.5 | 24.5 | 18.0 |
| sum | 100 | 100 | 0 |
| obs. | 1,109 | 1,029 | |
| Females | | | |
| My province | 60.7 | 31.6 | -29.1 |
| Other province | 15.1 | 8.7 | -6.4 |
| Abroad | 24.2 | 59.7 | 35.6 |
| Europe | 19.4 | 37.8 | 18.4 |
| Outside Europe | 4.8 | 22.0 | 17.2 |
| sum | 100 | 100 | 0 |
| obs. | 1,554 | 1,458 | |

**Notes:** The sample is only those students who intend to pursue graduate studies. Heteroskedasticity-robust standard errors. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Survey. Gender gaps characteristics

| | (1)<br>ln annual<br>earnings | (2)<br>Children<br>number | (3)<br>Age<br>birth child1 | (4)<br>Patience | (5)<br>Tolerance<br>risk | (6)<br>Care<br>hours | (7)<br>Relation. | (8)<br>Cohabit. |
|---|---|---|---|---|---|---|---|---|
| All GPA | | | | | | | | |
| Female | -0.16*** | -0.01 | -1.33*** | -1.28*** | -0.03 | 0.59** | 0.10*** | 0.02* |
| | [0.02] | [0.01] | [0.16] | [0.39] | [0.07] | [0.28] | [0.02] | [0.01] |
| GPA | -0.01 | 0.01 | 0.20** | 1.04*** | 0.08** | -0.57*** | -0.01 | -0.01* |
| | [0.01] | [0.01] | [0.10] | [0.22] | [0.04] | [0.16] | [0.01] | [0.01] |
| High SES | 0.11*** | -0.02* | -0.39*** | 1.86*** | 0.04 | -0.08 | -0.03* | -0.05*** |
| | [0.02] | [0.01] | [0.14] | [0.37] | [0.07] | [0.27] | [0.02] | [0.01] |
| Observations | 3,819 | 3,830 | 1,771 | 3,789 | 931 | 3,652 | 3,830 | 3,830 |
| Mean DepVar | 28791 | 0.02 | 30.4 | 19.7 | 10.5 | 5.9 | 0.45 | 0.07 |
| High GPA | | | | | | | | |
| Female | -0.09** | 0.02 | -1.18*** | -2.63*** | 0.03 | 1.11* | 0.12*** | 0.02 |
| | [0.04] | [0.03] | [0.40] | [0.78] | [0.16] | [0.57] | [0.04] | [0.02] |
| GPA | 0.10** | 0.07* | 0.86 | 1.30 | 0.17 | -0.72 | -0.04 | 0.05* |
| | [0.04] | [0.04] | [0.54] | [0.88] | [0.18] | [0.61] | [0.04] | [0.03] |
| High SES | 0.09** | -0.03 | -0.39 | 3.16*** | 0.02 | -0.44 | 0.01 | -0.01 |
| | [0.04] | [0.02] | [0.35] | [0.76] | [0.14] | [0.57] | [0.03] | [0.02] |
| Observations | 897 | 898 | 389 | 892 | 209 | 865 | 898 | 898 |
| Mean DepVar | 26418 | 0.04 | 30.3 | 20.7 | 10.6 | 5.8 | 0.44 | 0.08 |
| FE field, uni | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

**Notes:** University and field of study fixed-effects and intercept included in the models, but not shown in the Table. The top panel uses the whole sample and the bottom panel restricts to high GPA students. Point estimates displayed as 0.00 that are statistically significant should be interpreted as having a positive value but smaller than 0.01. The dependent variables are expected log earnings (annual), ideal number of children, age at birth of the first child, index of patience, index of risk tolerance, *Care hours* is the number of hours per week taking care of relatives (children, grandparents, etc.). *Relationship* and *Cohabitates* are indicators taking a value of 1 if the individual reports being in a relationship or cohabitates (and zero otherwise), respectively. Heteroskedasticity-robust standard errors. *** p<0.01, ** p<0.05, * p<0.1

Table 9: Survey. Interest in graduate studies abroad.

| | (1) Abroad Hypoth. | (2) Abroad | (3) Abroad | (4) Abroad | (5) Abroad | (6) Abroad |
|---|---|---|---|---|---|---|
| **All GPA** | | | | | | |
| Female | -0.02 | -0.05*** | -0.02 | -0.00 | -0.01 | 0.01 |
| | [0.02] | [0.02] | [0.02] | [0.02] | [0.02] | [0.02] |
| GPA | | | 0.05*** | 0.05*** | 0.06*** | 0.05*** |
| | | | [0.01] | [0.01] | [0.01] | [0.01] |
| High SES | | | 0.14*** | 0.14*** | 0.15*** | 0.13*** |
| | | | [0.02] | [0.02] | [0.02] | [0.02] |
| Exp. Ln earnings | | | | 0.06*** | | 0.06*** |
| | | | | [0.02] | | [0.02] |
| Patience | | | | 0.00** | | 0.00** |
| | | | | [0.00] | | [0.00] |
| Des. Children | | | | -0.07*** | | -0.05*** |
| | | | | [0.02] | | [0.02] |
| Care hours | | | | | -0.00* | -0.00* |
| | | | | | [0.00] | [0.00] |
| Relationship | | | | | -0.09*** | -0.09*** |
| | | | | | [0.02] | [0.02] |
| Cohabitation | | | | | 0.00 | -0.01 |
| | | | | | [0.03] | [0.03] |
| Observations | 2,098 | 2,215 | 2,194 | 2,133 | 2,073 | 2,033 |
| Mean DepVar | 0.61 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
| **High GPA** | | | | | | |
| Female | -0.04 | -0.09** | -0.02 | -0.00 | -0.01 | 0.01 |
| | [0.04] | [0.04] | [0.04] | [0.04] | [0.04] | [0.04] |
| GPA | | | 0.11** | 0.09* | 0.11** | 0.09* |
| | | | [0.05] | [0.05] | [0.05] | [0.05] |
| High SES | | | 0.18*** | 0.15*** | 0.19*** | 0.16*** |
| | | | [0.04] | [0.04] | [0.04] | [0.04] |
| Exp. Ln earnings | | | | 0.08** | | 0.07** |
| | | | | [0.04] | | [0.03] |
| Patience | | | | 0.00** | | 0.00** |
| | | | | [0.00] | | [0.00] |
| Desired Children | | | | -0.04 | | -0.05 |
| | | | | [0.05] | | [0.04] |
| Care hours | | | | | -0.00 | -0.00 |
| | | | | | [0.00] | [0.00] |
| Relationship | | | | | -0.09** | -0.09** |
| | | | | | [0.04] | [0.04] |
| Cohabitation | | | | | 0.02 | 0.01 |
| | | | | | [0.07] | [0.08] |
| Observations | 516 | 544 | 523 | 512 | 501 | 497 |
| Mean DepVar | 0.62 | 0.32 | 0.28 | 0.28 | 0.28 | 0.28 |
| FE field, uni | No | No | Yes | Yes | Yes | Yes |

**Notes:** The sample is restricted to students interested in graduate studies. The dependent variables are: an indicator for preferred program located abroad. Column 1 refers to the question referring to a hypothetical ‘unconstrained’ scenario. The top panel uses the whole sample and the bottom panel restricts to high GPA students. Point estimates displayed as 0.00 that are statistically significant should be interpreted as having a positive value but smaller than 0.01. Heteroskedasticity-robust standard errors. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

# Appendix

## A Uncensored cohorts

### A.1 Aggregate application rates for all universities

Our computation of *aggregate* application rates in the LCF program proceeds in two steps. First, we tally the number of applicants of a given gender $g$ that graduated in year $t$ in field of study $f$ from university $u(Applicants_{g,f,u,t})$ and normalize it by the number of graduates at the same level of aggregation ($Graduates_{g,f,u,t}$).[37] That is,

$$AR_{g,f,u,t} = \frac{Applicants_{g,f,u,t}}{Graduates_{g,f,u,t}}. \tag{2}$$

Clearly, we can compute application rates at a more aggregated level, adding across years, universities or fields of study. The results are collected in Table C.10. The top panel reports the aggregate application rates obtained when using all graduation cohorts (2009-2018). The first column shows that the FLC program received 1,530 applications (between 2014 and 2018) by graduates from the 4 universities in our study, which accounts for slightly less than one fifth of all the applications they received over that period.[38] The Table also shows that the number of female applicants was 14% higher than the number of male applicants. However, as shown in column 2, the number of female graduates was 17% higher than the number of male graduates. Column 3 reports the application rate in the fellowship program for all fields pooled together. We estimate that 1.10% of the graduates applied for a FLC fellowship.

The second step in the computation of the aggregate application rates addresses a censoring problem. Our dataset only contains applications to the LCF fellowship program for years 2014-2018. As shown in Table C.13 (for the graduates of the University of Barcelona), the application rate for graduation cohort 2009-2010 was 0.23%. The rate increased steadily to a peak value of 1.11% for graduation cohort 2013-2014, gradually falling after that until reaching a value of zero for graduation cohort 2018-2019. Thus, the 1.10% application rate estimated above suffers from a potentially severe censoring

[37] Clearly, the LCF applicants in year $t$ may have graduated in a previous year. We examine this issue further below. For now, it suffices to point out that the overall number of graduates in a given university and field of study is fairly constant over our sample period. Thus, the normalization we are applying will not be far from the true participation rate.

[38] We are only counting complete applications received by the deadline. Many more applications were initiated but were not completed in time or were left incomplete and were not reviewed.

problem. Put simply, the bulk of the applications for the earlier graduation cohorts took place prior to 2014 whereas the applications for the most recent cohorts took place in 2019 or beyond.[39] As we explain in detail in **??**, only graduation cohorts 2012-2014 can be considered uncensored.[40]

## A.2 Uncensored cohorts in the UB-LCF dataset

Let us consider first the whole dataset, which contains UB graduation cohorts 2009-2018 and applications data for 2014-2018. It is important to note that a requirement to apply for an LCF fellowship is to have graduated in the year of application or earlier. That is, a student graduating in academic year 2013-2014 (which we refer to as graduation cohort 2013) can first apply to the program in 2014 and any year after that. Additionally, the interest to pursue graduate studies typically fades away a few years after graduating from college. Thus, in our dataset, the application decisions of many graduation cohorts are severely censored.

Let us now examine our matched data from a longitudinal perspective. It is helpful to begin by focusing on graduation cohort 2013 (whose last academic year was 2013-2014) because for these graduates we are able to follow their application decisions over the full period of applications data (2014-2018). The data show that, among the 7,593 graduates in the 2013 cohort at the UB, only 84 applied to the LCF fellowship program, implying an application rate of 1.11%.

As shown in Table C.11, 21.4% of the applicants participated in the program in the year of graduation, that is, students graduating in academic year 2013-2014 applied to round 2014 of the fellowship. In fact, they were much more likely to apply one year after graduation (39.3%). Application rates fell sharply two years after graduation (10.7%) and hovered around that level for the next two years. Presumably, applications for this cohort gradually converged toward zero after 2018, but this is not observable within our data. Partly to examine this issue, but also to increase sample size, we widen our analysis to include the two adjacent cohorts 2012 and 2014. These two cohorts suffer from one additional year of censoring (relative to cohort 2013) but they allow us to triple

[39] In particular, individuals graduating in academic year 2018-2019 are not eligible for LCF fellowships until year 2019, which is not part of our applications dataset, which explains the zero application rate in Table C.13 for this graduation cohort.

[40] The year refers to the beginning of the senior academic year. That is, the uncensored cohorts graduated in academic years 2012-2013, 2013-2014 and 2014-2015. As we discuss in detail in the Appendix, these cohorts may also suffer from a certain degree of censoring, but it is likely to be very small.

the sample size and, in addition, provide a 6-year window on the applications data.[41]

Table C.12 summarizes the years to application for cohorts 2012-2014. First, we note that fewer than 3% of the applications are submitted 5 years after graduation. This low estimate is partly due to the censoring for the cohorts 2012 and 2013, but also suggests the tapering off of applications from the end of our data window. The larger sample size provides a clearer picture of the time profile of applications. The data show that 16% of the applications take place in the year of graduation $T$, 38% one year later ($T+1$), 19% in $T+2$, 15% in $T+3$, 10% in $T+4$ and 3% in $T+5$. That is, from second year after graduation onward, the application rate appears to fall by roughly 5 percentage points per year, suggesting that the degree of data censoring is small for these cohorts. For the sake of simplicity, we refer to graduation cohorts 2012-2014 as *uncensored cohorts*.

Table C.12 also provides a disaggregation by field of study that shows an important distinction: applicants in Arts & Humanities and Social Sciences tend to delay their applications much more than applicants in STEM and Health. In the former two fields the median years to application is 2-3 whereas in the latter two the median is only 1 year.

# B Detailed analysis of gender gaps in GPA distributions

## B.1 Regression-based estimates

A more formal comparison is presented in Table C.15 where we estimate the gender gap in GPA using linear regression models that control for major, graduation year, university and field of study. The first column confirms the slightly higher GPA for females (0.11 points in a 0-10 scale). Columns 2 and 3 confirm that women are over-represented in the top half and top quarter of the grades distribution of their majors. However, they are under-represented in the top 5% and top 2% (columns 5 and 6) by around 0.25 percentage points. Column 7 in Table C.15 shows that the gender gap for students in the top 5% is essentially the same if we restrict to the UB.[42] Last, column 8 shows that the gap is larger (at 0.4 percentage points) when we exclude the engineering school from the sample.

[41] The number of applications for these three cohorts combined is 248, up from 84 for cohort 2013 alone.

[42] Figure C.4 and Figure C.5 in the Appendix also illustrate this point.

## B.2 Alternative method to measure gender gaps along the GPA distribution: standardized GPA

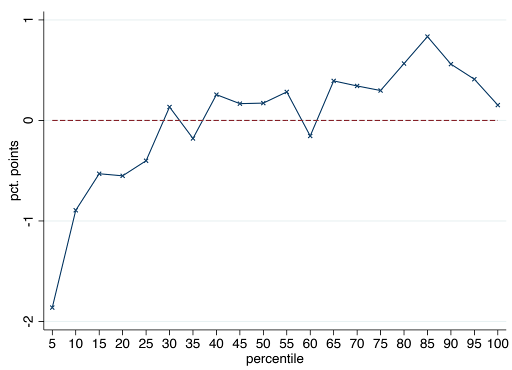
In our main analysis, we characterized the percentiles of the GPA distribution for each university and major. We then pooled individuals on the basis of their position in the corresponding percentiles.

As an alternative ,we now compare the GPA distributions of men and women using a different approach. Pooling observations after standardizing would be an approach if GPA distributions of college graduates were Gaussian. In that case, the resulting pooled distribution would also be a standard normal. However, the data shows that these distributions are not symmetric (and hence, not normally distributed). They tend to bunch slightly over the passing grade (5/10) and exhibit right-skewness. Thus the previous method is preferable as it does not make any distributional assumptions. We find:

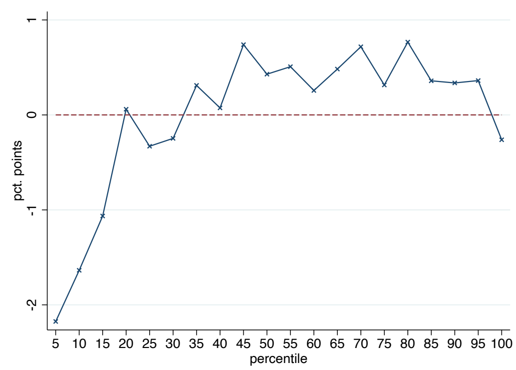
- We start from the raw GPA for each student. As shown in the top panel of Table C.16, average grades are lower in STEM (6.79 on a 0-10 scale) than in other disciplines (ranging from 6.99 in Social Sciences and 7.47 in Health and Life Sciences). In addition, on average women's GPA is 4% higher than men's, although the gender gap is practically non-existing in all fields except for Social Sciences.
- Next, we standardize each student's GPA using the mean and standard deviation of the corresponding major and university, and pool all observations. The resulting data again show that women, on average, have higher GPA than men (by about 0.06 standard deviations). This is the case in all disciplines, except in Arts & Humanities where women have lower grades, on average than men.
- Between the 90th and 95th percentiles, women are slightly over-represented. However, above the 95th percentile they are under-represented. The gap is larger than obtained with our previous method. We now estimate a gap of 0.72 percentage points in this bracket, compared to 0.26 percentage points. However, as discussed above, this method is less reliable for non-normal distributions (like ours).

# C Tables and Figures

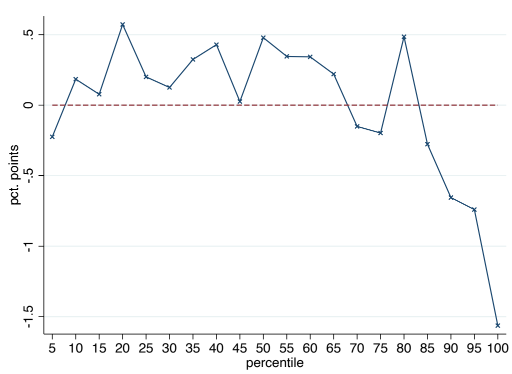
Figure C.3: Difference in GPA probability distribution (in percentage points) by gender and field. All universities pooled.



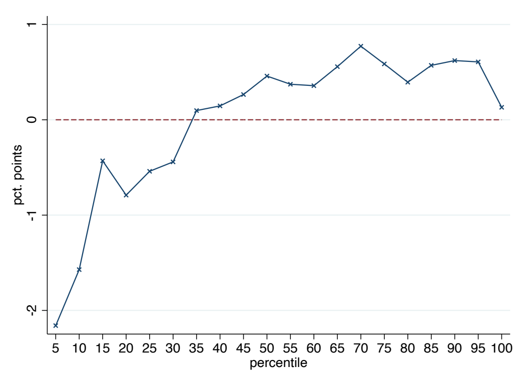

((a)) STEM




((b)) Health




((c)) Arts & Humanities




((d)) Social Sciences

Notes: Data for the 4 universities for graduation cohorts 2009-2018 for a total of 161,597 individual records. GPA at graduation administrative records. Each individual data point has been placed in the percentile bracket corresponding to the GPA distribution in its own major and university. STEM panel plots data for the university specialized in engineering and technology.

Figure C.4: GPA distributions by gender. UB only

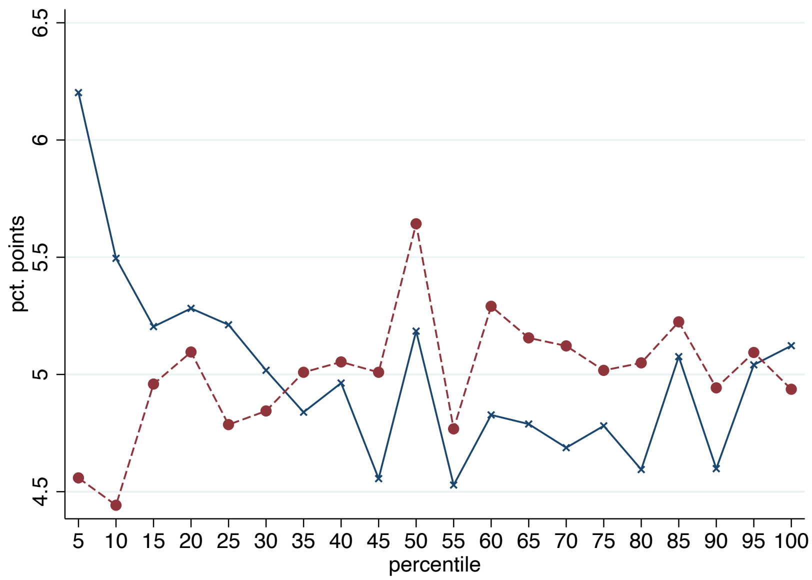
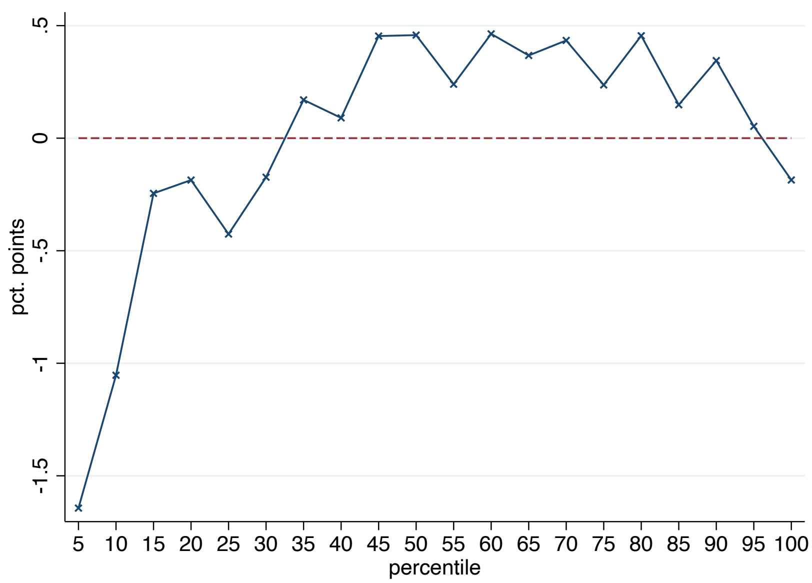



Figure C.5: Difference in probability density female - male




Notes: UB only, graduation cohorts 2009 (academic year 2009-2010) through 2018 (academic year 2018-2019). Based on individual records for 75,478 graduates. GPA at graduation administrative records. Each individual data point has been placed in the percentile bracket corresponding to the GPA distribution in its own major. The data for the UB contains 73 majors.

Table C.10: Aggregate Application Rates by University

| Gender | Uni | Counts Applications | Counts Grads | PR All Fields | PR STEM | PR Health | PR ArtsHum | PR Soc. Sci. |
|---|---|---|---|---|---|---|---|---|
| All cohorts | | | | | | | | |
| Both | All | 1,530 | 139,298 | 1.10 | 1.25 | 1.94 | 1.54 | 0.58 |
| Male | All | 715 | 64,081 | 1.12 | 1.17 | 2.21 | 1.46 | 0.67 |
| Fem. | All | 815 | 75,217 | 1.08 | 1.44 | 1.85 | 1.59 | 0.54 |
| Ratio F/M | All | 1.14 | 1.17 | 0.97 | 1.23 | 0.84 | 1.09 | 0.80 |
| Uncensored cohorts | | | | | | | | |
| Both | All | 815 | 49,107 | 1.66 | 1.84 | 3.41 | 2.20 | 0.87 |
| Male | All | 371 | 22,365 | 1.66 | 1.69 | 3.78 | 2.19 | 1.00 |
| Fem. | All | 444 | 26,742 | 1.66 | 2.22 | 3.28 | 2.21 | 0.80 |
| Ratio F/M | All | 1.20 | 1.20 | 1.00 | 1.31 | 0.87 | 1.01 | 0.80 |
| Both | UB | 249 | 23,217 | 1.07 | 2.75 | 2.30 | 1.41 | 0.33 |
| Male | UB | 93 | 8,087 | 1.15 | 2.43 | 2.86 | 1.53 | 0.33 |
| Fem. | UB | 156 | 15,130 | 1.03 | 3.22 | 2.11 | 1.35 | 0.34 |
| Ratio F/M | UB | 1.68 | 1.87 | 0.90 | 1.32 | 0.74 | 0.88 | 1.03 |
| Both | Uni2 | 206 | 6,984 | 2.95 | 6.12 | 6.03 | 2.86 | 1.31 |
| Male | Uni2 | 76 | 2,400 | 3.17 | 4.75 | 5.61 | 2.91 | 1.67 |
| Fem. | Uni2 | 130 | 4,584 | 2.84 | 8.94 | 6.22 | 2.84 | 1.16 |
| Ratio F/M | Uni2 | 1.71 | 1.91 | 0.90 | 1.88 | 1.11 | 0.97 | 0.70 |
| Both | Uni3 | 173 | 5,517 | 3.14 | 5.71 | 10.38 | 4.79 | 2.17 |
| Male | Uni3 | 68 | 2,132 | 3.19 | 4.61 | 8.57 | 5.52 | 2.47 |
| Fem. | Uni3 | 105 | 3,385 | 3.10 | 11.76 | 11.05 | 4.60 | 1.97 |
| Ratio F/M | Uni3 | 1.54 | 1.59 | 0.97 | 2.55 | 1.29 | 0.83 | 0.80 |
| Both | Uni4 | 187 | 13,389 | 1.40 | 1.40 | | | |
| Male | Uni4 | 134 | 9,746 | 1.37 | 1.37 | | | |
| Fem. | Uni4 | 53 | 3,643 | 1.45 | 1.45 | | | |
| Ratio F/M | Uni4 | 0.40 | 0.37 | 1.06 | 1.06 | | | |

**Notes:** The application rates is the number of ever applicants (by field-university-gender cell) over the size of the corresponding graduating cohort, or analogous ratios at lower levels of aggregation. The middle and bottom panel report data for uncensored cohorts only (graduation in academic years 2012-2013 through 2014-2015). *All* refers to the four universities (UB, UAB, UPC and UPF) pooled together. Except for the UB, the other universities are renamed to preserve confidentiality. The university specialized in engineering has a few majors in Social Sciences but they are very small in terms of enrollment. In fact, our data contain only one applicant to the fellowship program from these majors, which is insufficient to estimate application rates with any degree of confidence.

Table C.11: Years to application. UB-FLC. Ideal cohort

| | All Fields | STEM | Health | ArtsHum | Social Sci |
|---|---|---|---|---|---|
| Obs. | 84 | 21 | 34 | 19 | 10 |
| 0 | 21.4 | 28.6 | 29.4 | 10.5 | 0.0 |
| 1 | 39.3 | 57.1 | 50.0 | 15.8 | 10.0 |
| 2 | 10.7 | 9.5 | 5.9 | 21.1 | 10.0 |
| 3 | 13.1 | 0.0 | 5.9 | 15.8 | 60.0 |
| 4 | 15.5 | 4.8 | 8.8 | 36.8 | 20.0 |
| Median | 1.0 | 1.0 | 1.0 | 3.0 | 3.0 |
| Mean | 1.83 | 0.95 | 1.15 | 2.53 | 2.90 |

Table C.12: Years to application. UB-FLC. Uncensored cohorts

| | All Fields | STEM | Health | ArtsHum | Social Sci |
|---|---|---|---|---|---|
| Obs. | 248 | 65 | 97 | 50 | 36 |
| 0 | 15.7 | 21.5 | 17.5 | 12.0 | 5.6 |
| 1 | 37.5 | 43.1 | 44.3 | 30.0 | 19.4 |
| 2 | 19.4 | 23.1 | 17.5 | 18.0 | 19.4 |
| 3 | 14.9 | 7.7 | 11.3 | 20.0 | 30.6 |
| 4 | 9.7 | 3.1 | 5.2 | 18.0 | 22.2 |
| 5 | 2.8 | 1.5 | 4.1 | 2.0 | 2.8 |
| Median | 1.0 | 1.0 | 1.0 | 2.0 | 3.0 |
| Mean | 1.83 | 1.30 | 1.60 | 2.10 | 2.50 |

Notes: Matched UB-FLC Fellowship. The UB data contains graduating cohorts 2009-2018. Note that graduating cohort 2013 refers to students that graduated in academic year 2013-2014 (ideal cohort). These students were eligible to apply to the fellowship rounds 2014 onward. The LaCaixa data contains rounds 2014-2018. Uncensored cohorts are the graduating cohorts 2012-2014.

Table C.13: Female shares and application rates. UB-FLC matched data.

| Graduation cohort | Graduates | Share females | PR |
|---|---|---|---|
| 2009 | 7,925 | 0.69 | 0.23 |
| 2010 | 8,593 | 0.68 | 0.34 |
| 2011 | 7,104 | 0.64 | 0.68 |
| 2012 | 8,096 | 0.65 | 1.05 |
| 2013 | 7,593 | 0.65 | 1.11 |
| 2014 | 7,528 | 0.65 | 1.05 |
| 2015 | 7,266 | 0.67 | 1.02 |
| 2016 | 7,383 | 0.65 | 0.64 |
| 2017 | 7,017 | 0.64 | 0.51 |
| 2018 | 7,091 | 0.66 | 0 |
| 2009-2018 | 75,596 | 0.66 | 0.66 |
| 2012-2014 | 23,217 | 0.65 | 1.07 |

**Notes:** Matched UB-FLC Fellowship. The UB data contains graduating cohorts 2009-2018. The FLC data contain rounds 2014-2018. Uncensored cohorts are the graduating cohorts 2012-2014.

Table C.14: Summary statistics. UB-FLC. All cohorts

| | All | Male | Fem-Male |
|---|---|---|---|
| Female | 66.39 | | |
| GPA | 7.24 | 7.10 | 0.21*** |
| 90p <GPA< 95p | 5.19 | 5.17 | 0.03 |
| GPA > 95p | 5.21 | 5.37 | -0.23 |
| Age | 24.28 | 24.81 | -0.80*** |
| One College parent | 20.85 | 21.80 | -1.43*** |
| Two College parent | 19.90 | 22.68 | -4.20*** |
| STEM | 8.27 | 14.50 | -9.38*** |
| Health | 21.31 | 15.64 | 8.54*** |
| Social | 55.25 | 54.09 | 1.75*** |
| ArtsHum | 15.00 | 15.60 | -0.90*** |
| Observations | 63,701 | | |

Notes: Matched UB-FLC dataset. All graduation cohorts 2009-2018. Only students with information on parental education. GPA is on a 0-10 scale (with passing grade 5.0). All variables (except GPA) in percentage. GPA percentiles 90p and 95p are specific to each student's major, pooling men and women. There are 73 majors at the UB.

Table C.15: Comparison GPA distributions. Admin records all universities.

| | (1) GPA | (2) Top50 | (3) Top25 | (4) Top10 | (5) Top5 | (6) Top2 | (7) Top5 | (8) Top5 |
|---|---|---|---|---|---|---|---|---|
| Fem | 0.11*** | 3.11*** | 1.33*** | -0.03 | -0.26** | -0.23*** | -0.23 | -0.40*** |
| | [0.00] | [0.27] | [0.23] | [0.16] | [0.12] | [0.08] | [0.18] | [0.13] |
| Obs. | 161,207 | 161,207 | 161,207 | 161,207 | 161,207 | 161,207 | 75,478 | 120,507 |
| Mean dep.var. | 7.11 | 49.9 | 24.91 | 9.94 | 4.97 | 1.98 | 4.99 | 4.99 |
| FE major | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| FE year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| FE uni | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes |
| FE field | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes |
| Univ. | All | All | All | All | All | All | UB | No Uni4 |

**Notes:** We computed each student's position in the GPA distribution of his/her major and university. We then pooled all observations and constructed indicators for belonging to the top (50, 25, 10, 5 or 2) percent of the pooled grades distribution. Unless otherwise stated, data for all majors and universities are being used (and for all available graduation cohorts). The last column excludes the university specialized in engineering (Uni4).

Table C.16: Comparison GPA distributions 2. Admin records all universities.

| GPA | Mean Male | Mean Fem | Mean FM ratio |
|---|---|---|---|
| All Fields | 6.96 | 7.23 | 1.04 |
| | | | |
| STEM | 6.79 | 6.77 | 1.00 |
| Health | 7.39 | 7.47 | 1.01 |
| Hum | 7.43 | 7.41 | 1.00 |
| Soc | 6.99 | 7.25 | 1.04 |

| zGPA | Mean Male | Mean Fem | Mean F-M gap |
|---|---|---|---|
| All Fields | -0.033 | 0.027 | 0.06 |
| | | | |
| STEM | -0.013 | 0.033 | 0.05 |
| Health | -0.071 | 0.026 | 0.10 |
| Hum | 0.052 | -0.025 | -0.08 |
| Soc | -0.076 | 0.039 | 0.12 |

| zGPA | 90-95p Male | 90-95p Fem | 90-95p F-M gap |
|---|---|---|---|
| All Fields | 4.72 | 5.22 | 0.50 |
| | | | |
| STEM | 4.98 | 4.94 | -0.04 |
| Health | 4.98 | 5.01 | 0.03 |
| Hum | 5.41 | 4.82 | -0.59 |
| Soc | 4.38 | 5.30 | 0.92 |

| zGPA | $> 95p$ Male | $> 95p$ Fem | $> 95p$ F-M gap |
|---|---|---|---|
| All Fields | 5.40 | 4.68 | -0.72 |
| | | | |
| STEM | 5.16 | 4.71 | -0.45 |
| Health | 5.15 | 4.95 | -0.20 |
| Hum | 6.19 | 4.41 | -1.78 |
| Soc | 5.21 | 4.89 | -0.32 |

**Notes:** Top panel compares raw GPA (in a 0-10 scale), second panel compares GPA standardized ($zGPA$) using mean and standard deviation of the corresponding major-university distribution, third panel compares the 90-95th percentile bracket of the standardized GPA distribution, and bottom panel compares the 95-100th percentile bracket of the standardized GPA distribution.

Table C.17: Conditional gender gap in fellowship application. Contributions

| | (1)<br>Males | (2)<br>Females | (3)<br>Fem - Male | (4)<br>Fem/Male |
|---|---|---|---|---|
| Prediction Sample All GPA | | | | |
| Mean probability | 1.20 | 0.95 | -0.25 | 0.79 |
| Mean predicted probability | **1.24** | 0.98 | -0.26 | 0.79 |
| Male Fields | | 1.12 | -0.12 | 0.91 |
| Male Fields & Age | | 1.05 | -0.19 | 0.85 |
| Male Fields, Age & SES | | 1.13 | -0.10 | 0.92 |
| Male Fields, Age , SES & GPA | | 0.97 | -0.27 | 0.78 |
| Male Fields, Age , SES & GPA & Perc. | | 0.96 | -0.27 | 0.78 |
| Male Fields, Age , SES & GPA & Perc. & Cohort | | **0.97** | **-0.27** | **0.78** |
| Prediction Sample GPA>75p | | | | |
| Mean probability | 3.35 | 2.32 | -1.03 | 0.69 |
| Mean predicted probability | **3.33** | 2.30 | -1.03 | 0.69 |
| Male Fields | | 2.92 | -0.40 | 0.88 |
| Male Fields & Age | | 2.69 | -0.63 | 0.81 |
| Male Fields, Age & SES | | 2.74 | -0.59 | 0.82 |
| Male Fields, Age , SES & GPA | | 2.44 | -0.89 | 0.73 |
| Male Fields, Age , SES & GPA & Perc. | | 2.48 | -0.85 | 0.74 |
| Male Fields, Age , SES & GPA & Perc. & Cohort | | **2.48** | **-0.85** | **0.74** |

**Notes:** The predictions are based on the estimates in Table 3 (column 5). We then evaluate the estimated model at the means of the covariates by gender (uncensored cohorts only). The top panel reports predictions for the whole sample (all GPA) and the bottom panel makes predictions only for high-GPA students (but uses the same estimated coefficients as the top panel). Gradually, we assign the mean male values of the covariates to females and examine how the gender gap (female-male predicted application) evolves. *SES* stands for socio-economic status as is measured as the number of college-educated parents. In terms of GPA, we first equalize mean GPA and then the shares of graduates in the top brackets of the GPA percentile distribution (Perc.). The conditional female-male application ratio is shown in bold in column 4. It is the ratio of the predicted application rate for females over males, both of which have been evaluated at the mean values of the male subsample.