Gender differences in preferences for taking risk in college applications☆

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ABSTRACT

College admissions in Turkey are based entirely on nationwide standardized test scores and standardized high school GPAs. Using detailed administrative data from the centralized system, I study the impact of gender differences in preferences on the allocation of students to colleges. Controlling for test score, high school GPA, and high school attended, I find that females are more likely to apply to lower-ranking universities, whereas males set a higher bar, revealing a higher option value for retaking the test and applying again next year. These differences in willingness to be unassigned are also found to have implications for major choices.

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1. Introduction

In the last few decades, the gender gap in education has changed remarkably in favor of females in many countries. Females now outperform males in general academic achievement. However, while the share of males in total higher education enrollment dropped considerably, females still remain underrepresented in many high-wage occupations.

A number of studies provide explanations for the reduction in the gender gap in higher education enrollment (Blau, 1998; Goldin, Katz, & Kuziemko, 2006; Jacob, 2002; Peter & Horn, 2005; Reynolds & Burge, 2008) and gender differences in college major choices (Barres, 2006; Friedman, 1989; Polachek, 1978; 1981; Turner & Bowen, 1999; Xie & Shauman, 2003; Zafar, 2013). They suggest two plausible explanations for the gender difference in highly selective higher education programs: differences in preferences for college majors (e.g., males prefer engineering programs while females prefer education or social sciences) and differences in abilities and achievement distributions (e.g., males still dominate in the highest quantiles of the distribution). However, the existing literature fails to incorporate both explanations in order to understand the reasons behind the persistent underrepresentation of females in highly selective university programs despite the remarkable rise in female educational achievements.

To address this issue, I use detailed administrative data from the Turkish university entrance test in 2008. The

data include applicants' choices across all university programs, so that I can directly investigate the potential differences in choices made by males and females conditional on achievements; namely, standardized test scores. This paper documents the existence of a gender gap in the willingness to be unassigned and retake the exam for a higher test score in order to get into a better university program. Additionally, I offer a new perspective on heterogeneity in school choice[1] by measuring the differences in reservation university programs.[2]

In Turkey, the transition from high school to higher education is highly centralized and only possible through a standardized multiple choice test[3] conducted at a national level.[4] After taking the test and receiving their scores, applicants submit a list of higher education programs in order of preference and a central authority applies an algorithm to assign students to each program, taking into consideration the students' preferences and their test scores. The number of university applicants is so large that the demand for higher education is far from being met. Driven by high competition to get into a quality program, a large number of applicants retake the test because they failed to obtain a high enough test score to be placed in their desired program. In other words, they choose to be unassigned at the cost of not enrolling at all, and instead, retake the test the following year. Retaking the test is costly since applicants have to spend another year preparing for the exam in a very competitive environment, and risky since they also face the uncertainty of their new test score. If applicants decide not to retake the exam next year, they still face another decision involving some risk; that is, they still need to determine how safe their choice list should be, which they submit after receive their scores; and what their reservation university program is based on the lowest test score requirement from the previous year.

Recent studies provide evidence of significant gender differences in attitudes towards risk and competition and performance within competitive environments. Literature on gender differences in risk preferences and reaction to competition shows that females are more risk-averse than males and not only avoid competition but also perform worse under competition (Dohmen & Falk, 2011; Gneezy, Niederle, & Rustichini, 2003; Niederle & Vesterlund, 2007). Buser, Niederle, and Oosterbeek (2014) shows that a significant part of the gender difference in major choice can be attributed to gender differences in competitiveness, and

(Ors, Palomino, & Peyrache, 2013) provide evidence for a decreasing gender gap in less competitive environments. Since the willingness to wait another year and the effect of uncertainty and competition could vary across gender, it is reasonable to expect that the willingness to be unassigned, reflected initially in the choice of university programs and eventually in assignment outcomes, could differ by gender. Applicants less willing to be unassigned to a university should, for example, have a lower reservation university program, which means that they should apply to lower-ranking university programs.

I use these characteristics of the institutional setting to answer the following questions: are there gender differences in willingness to be unassigned, and if so, does this lead to gender differences in university program choices? What are the implications of these differences on outcomes? My results show that, controlling for test scores, high-school and other individual characteristics, females seem to include more programs that have a lower cutoff score than the applicant's test score in the corresponding category. I find that the number of safe choices in the choice lists is higher by 0.62 for females.[5] Conditional on having decided not to retake the test, that is having at least one safe choice, the number of safe choices remains higher for females. This implies that female applicants make safer choice lists even after conditioning on willingness to retake.[6] These differences in decision making are also reflected in university program choices. Females' reservation choice university program's cutoff score is lower by 5.8 points[7] and this difference remains significant and around 2.2 points conditional on major fixed effects and first and median choice cutoff scores. On the other hand, I do not find a significant difference in first choice cutoff score. In addition, I find that females have higher test scores conditioning on assignment outcome. I find that female applicants score almost 5 points higher than males conditional on the university program that they are assigned to. Finally I show that gender differences in taking risk have some implications for major choices where females are more likely to choose low profile majors (such as Pre-College Degrees and Vocational Programs) and less likely to choose high profile majors (such as Medical School, Law School, Engineering) as their last option even though this is not necessarily the case for their first choices.

The rest of the paper is organized as follows: In Section 2, I provide details about the institutional setting in Turkey, and in Section 3, I describe the data and provide some descriptive statistics to motivate the rest of the paper. Empirical analysis of this paper has two stages. First, I

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[1] Cullen, Jacob, and Levitt (2006), Hastings, Kane, and Staiger (2007), Ajayi (2013).

[2] Moreover, I demonstrate that gender differences in choices are highly associated with one's willingness to guess on multiple choice tests in the appendix of this paper.

[3] Incorrect answers are penalized to avoid gains by guessing.

[4] Similarly, there are many other countries having a similar centralized test-based university entrance system such as United States (SAT and ACT), Sweden (Swedish Scholastic Aptitude Test, abbreviation Swe-SAT, Hogskoleprovet in Swedish), France (Baccalaurèat (or le bac)), Colombia (SABER 11 Exam), Chile (Prueba de Selecciòn Universitaria or PSU), Brazil (Vestibular or ENEM), and National College Entrance Examination (gaokao) in China. On the other hand, while all these countries apply a standardized test method as a common characteristic, their admission systems differ substantially.

[5] While applicants are allowed to make a list of up to 24 programs, the average number of choices is 14.42.

[6] I also construct another measure in the appendix section that allows me to describe the willingness to be unassigned to a university and show that there are significant differences across genders in this measure. I find that females are less likely to be willing to be unassigned and this difference is estimated at around 3 percentage points.

[7] The average test score in 2008 is 210, and a 1 point increase from 210 to 211 in test score makes the applicant move ahead of around 14.750 other applicants according to the test score distributions published by OSYM in 2008. This number would be obviously smaller for any test scores at the tails of the distribution.