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A New Look at the Gendered Logic of College Choice: A Multidimensional Approach to Gender Segregation by Institutional Selectivity in Japanese College Admissions¹

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Abstract

Despite the reversal of the gender gap in higher education, gender segregation persists in fields of study and institutional selectivity. Recent research suggests that similar educational aspirations may not translate into similar college choices for men and women. Yet much of this research focuses on a single aspiration measured at a single point in time, overlooking the multidimensional, and potentially dynamic nature of educational preferences. Using unique nationwide mock-exam data from Japan, we show that, even among students with similarly selective first choices, women are less likely than men to list another highly selective program among their lower-ranked options. Contrary to our expectations, however, the gender gap in selectivity narrows at the application stage because men are more likely than women to apply to universities that are less selective than their stated first choice. Decomposition analyses further reveal that gender differences in application selectivity reflect not only first choices but also lower-ranked preferences. Preferences reported before the application process statistically account for approximately 70% of the gender gap in application selectivity, while incorporating stated college-major preferences further increases the share of this gap accounted for by preferences. Although substantial gender differences remain, these findings suggest that stated preferences play a larger role than prior studies may have recognized, particularly in terms of studies focusing on a single dimension of preference or only on first-choice preferences. Reducing gender inequality in higher education and beyond may therefore require the examination of both the formation of preferences and their translation into college applications, with the former warranting particular emphasis.

Keywords: gender, higher education, aspiration, application, Japan
JEL classification: I23, I24, J16

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Introduction

In the majority of countries where access to higher education has expanded, women's rates of attendance and completion have surpassed men's (DiPrete and Buchmann 2013; Esteve et al. 2012, 2016; van Bavel 2012). This reversal of the gender gap may have important implications for gender egalitarianism and family change, as previous studies have argued that highly educated women are early adopters of more egalitarian family practices (Esping-Andersen and Billari 2015; Goldin 2021; Goldscheider et al. 2015). Yet men's and women's educational trajectories remain segregated within higher education in many contexts, particularly with respect to fields of study (Barone 2011; England 2010; England and Li 2006; van de Werfhorst 2017) and college selectivity (Bielby et al. 2014; Buchmann et al. 2010; Uchikoshi et al. 2025). Because gender segregation in higher education has persisted in many countries (Barone 2011; England and Li 2006), is linked to occupational gender segregation (Zheng and Weeden 2023), and contributes to gender inequality in the labor market (Barone 2011; Charles and Bradley 2009; England and Li 2006; Gerber and Cheung 2008), the expansion of higher education and the reversal of the gender gap may not, by themselves, lead to greater gender equality.

Although this body of research uses different terminology and draws on distinct theoretical perspectives, it highlights the importance of students' aspirations, preferences, plans, and expectations in shaping their pathways into postsecondary education (Frye 2012; Quadlin 2020; Weeden et al. 2020). More recent research has further examined how adolescents translate broad, relatively unconstrained aspirations into choices made within institutional constraints. One such framework is Quadlin's (2020) theory of the gendered logic of college choice. Drawing on data from the U.S. Pathways through College Study, Quadlin demonstrates that similar preferences may nevertheless produce different behavioral outcomes for men and women.

These studies offer important theoretical insights into how gender may complicate the relationship between values and behaviors. Most, however, operationalize these agentic forces unidimensionally by focusing on a single stated aspiration or expectation. In principle, such orientations may be multidimensional. Recent studies by Sigal Alon and her colleagues provide valuable insights into this multidimensionality in educational pathways (Alon and DiPrete 2015; Gelbgiser and Alon 2024, 2025). Using data on college applicants in Israel, these studies examine how students' choice sets, as revealed during the application process, relate to admission outcomes and how these processes contribute to gender segregation across fields of study.

Nevertheless, using application data to measure preferences is challenging because applicants' stated "preferences" are already shaped by constraints imposed by the admissions system. For example, in many contexts, applicants may submit only a limited number of ranked choices (Han et al. 2025; Gelbgiser and Alon 2025). Even where no such formal restrictions exist, application decisions may be influenced by factors such as the likelihood of admission and application fees (Delaney and Odle 2025). Thus, while treating revealed choice sets as indicators of preferences is theoretically compelling, it remains an imperfect approach.

Our goal in this paper is to address these limitations in the literature on multidimensional preferences and gender segregation in college choice by leveraging unique data from nationwide mock examinations in Japan. Administered by private testing companies, these examinations

allow students to rank multiple university programs and provide information on their pre-exam preferences, estimated admission probabilities, subsequent applications, and admission outcomes. These data make it possible to examine how multidimensional preferences translate into gender differences in application behavior. We first examine whether students' ranked preferences for the colleges they aspire to attend differ systematically by gender. We also investigate whether men and women who share the same first-choice program nevertheless differ in the colleges they rank as subsequent choices. Second, we assess the extent to which these gender differences in multidimensional preferences contribute to gender segregation in higher education.

In this study, we specifically examine the case of school selectivity. This is because Japanese higher education has witnessed the persistent gender disparity in selective college attendance despite women's rapid improvement in access to four-year universities over the last three decades (from 15.2% in 1990 to 56.2% in 2024). As Figure 1 shows, only 20% of undergraduate students at the University of Tokyo—the nation's most selective university—are women. More broadly, women make up only about 30% of applicants to the Former Imperial Universities, Japan's equivalent of Ivy League schools. Selective institutions occupy a particularly important position in educational hierarchies: they provide access to valued credentials and influential social networks and often serve as pathways into prestigious occupations (Brand and Halaby 2006; Domina et al. 2017; Ge et al. 2022; Karen 2002; Sekhri 2020). Gender differences in access to these institutions may therefore have consequences that extend beyond college enrollment and contribute to the reproduction of inequality in the labor market.

Our findings highlight the multidimensional nature of educational preferences and the gendered processes through which preferences are translated into application decisions. Even among students whose first choices are similarly selective, women are less likely than men to include another selective program among their lower-ranked options. At the same time, men are more likely than women to apply to institutions that are less selective than their stated first choice, narrowing the gender gap in selectivity at the application stage. Decomposition analyses indicate that differences in lower-ranked preferences, in addition to first choices, account for a substantial share of the gender gap in application selectivity. Preferences reported before the application process account for approximately 70 percent of this gap, and including stated college-major preferences further increases the share of gender segregation accounted for by preferences. Although substantial gender differences remain, these findings suggest that stated preferences play a larger role than prior studies may have recognized, particularly those focusing on a single dimension of preference or only on first-choice preferences. Reducing gender inequality in higher education and beyond may therefore require attention to both the formation of preferences and their translation into college applications, with the former warranting particular emphasis.

[Figure 1 about here]

Background

Gendered logic of college choice

Educational aspirations are shaped through the interaction of academic self-assessments, socialization, and institutional opportunities.² The Wisconsin model of status attainment highlights how students' educational orientations connect social background to later educational attainment (Sewell et al. 1969). Subsequent research shows that these orientations are influenced by students' assessments of their academic performance, expectations communicated by parents and peers, and the institutional environments in which they are educated. In particular, educational tracking can align students' expectations with the opportunities made visible by their schools and thereby narrow the range of futures they seriously consider (Buchmann and Dalton 2002; Buchmann and Park 2009; Chmielewski 2014; Kerckhoff 1977).

These processes have important gendered implications. Educational goals are often connected to anticipated occupations, and occupational expectations remain shaped by cultural beliefs about men's and women's abilities, interests, and future responsibilities. Male students are more likely to anticipate careers in STEM fields, whereas female students are more likely to express plans for health-related occupations (Morgan et al. 2013; Weeden et al. 2020). Such differences in occupational plans help explain gender disparities in STEM enrollment and completion, even after accounting for academic achievement, self-assessed ability, and family-related orientation. Gendered educational orientations may therefore contribute to educational segregation not primarily by producing large differences in overall ambition, but by directing students toward different fields and forms of education.

The institutional organization of higher education may reinforce these patterns. As higher education systems expand and differentiate, they offer a wider range of programs that can accommodate and institutionalize gender-differentiated interests. Charles and Bradley (2009) describe these programs as "gender-specific curricular niches," through which expressive interests associated with masculinity and femininity become linked to particular fields of study. Educational expansion may thus increase women's and men's access to higher education overall while leaving intact, or even strengthening, gender differences in the types of programs they pursue.

These arguments also suggest the importance of distinguishing broad aspirations from concrete educational preferences. Students may hold ambitious expectations about attending college or pursuing a desirable future while lacking detailed knowledge about admissions procedures, available alternatives, or the resources required to achieve those goals (Rosenbaum 2001; Schneider and Stevenson 1999; Goyette 2008). Moreover, students may hold aspirations

² Although the literature commonly uses the term aspirations, we use preferences for the orientations measured in our data. Aspirations generally refer to broad and sometimes uncertain visions of desirable or attainable educational and occupational futures. By contrast, our data capture students' ranked preferences among specific university programs before submitting applications. These rankings show how students order concrete alternatives relative to one another, rather than simply whether they hope or expect to pursue higher education. We use *preference* to emphasize the institution- and program-specific, multidimensional, and relational nature of the orientations examined in this study. This terminology does not imply that preferences are purely individual or independent of socialization, institutional contexts, or perceived constraints; like aspirations, they are socially formed and structured.

concerning both the type of institution they hope to attend and the field they wish to study, and these dimensions need not be perfectly aligned. A student may aspire to attend a prestigious university while remaining uncertain about a field of study, or may have a clear occupational goal without a specific institutional preference. The translation of these broad and multidimensional aspirations into concrete and ranked college preferences may therefore be an important stage at which gendered patterns emerge. Our analysis examines this process by focusing on students' ranked preferences among specific university programs before they submit applications.

College choice is therefore socially embedded rather than determined solely by students' stated preferences. Parents, teachers, and peers may shape how students evaluate their abilities, rank alternatives, and assess which options are feasible (Armstrong and Hamilton 2013; DiPrete and Buchmann 2013; Hamilton 2016; Lor 2023; Mullen 2010). This perspective motivates our distinction between the content of preferences and their translation into educational decisions.

Gender differences in college selectivity

Research has identified several explanations for gender differences in applications to selective universities that correspond to the framework developed above. On the one hand, there may be gender differences in the content and organization of educational preferences. Men and women may develop different preferences and expectations, particularly regarding fields of study and the occupations associated with them (Weeden et al. 2020; Williams and Ceci 2012). With respect to future orientations, studies suggest that women's plans are more likely to be constructed as a bundled "package" encompassing both family events and occupational careers (Hardie 2022; Wong 2017).

Women may therefore evaluate college options according to a broader set of considerations, including field of study, geographic location, campus environment, and compatibility with anticipated family and work responsibilities. When multiple priorities must be satisfied simultaneously, women may perceive a narrower set of institutions as suitable or feasible and may place greater weight on fit relative to selectivity. Two dimensions that may be particularly relevant are field of study and geographic proximity.

First, gendered assumptions about educational and occupational domains can shape students' perceptions of which fields are appropriate for men and women (Charles and Bradley 2009). Evidence from Japan, consistent with findings from other contexts, suggests that gender stereotypes influence perceptions of suitable fields of study (Froehlich et al. 2022; Ikkatai et al. 2020). These perceptions may affect not only students' field preferences but also the range of institutions they consider, since particular fields may be available only at particular universities. Women may therefore be more likely to construct preference sets that prioritize consistency in field of study across alternatives, whereas men may place greater weight on institutional selectivity. If this is the case, the gender gap in selectivity may partly arise because men and women organize their university choices around different priorities.

Second, geographic proximity may constitute another gendered dimension of college choice (Lor 2023; McDonough 1997). This consideration may be particularly salient in East Asian societies, including Japan, where daughters are often viewed as important sources of future emotional and

practical support. Studies documenting preferences for daughters to live nearby, as well as parents' anticipated care needs, support this possibility (Chun and Das Gupta 2022; Fuse 2013; Ishikawa 2009; Okuda 2022). In Japan, such expectations may make female students more likely to be encouraged—or expected—to attend universities within commuting distance of their parents' home (Emori and Kawasaki 2024). Geographic constraints may consequently narrow women's choice sets and make highly selective institutions less attainable when they are located far from home. We examine this possibility alongside the role of fields of study.

Men, by contrast, may be more likely to organize their choices around a relatively singular focus on extrinsic rewards, such as expected earnings (Ma 2009; Zafar 2013). In contexts such as Japan, where attending a selective institution is strongly associated with access to occupations offering greater economic returns (Ono 2007), this orientation may lead men to place greater weight on selectivity. This does not imply that women are less ambitious or that men's choices are driven exclusively by prestige. Rather, gendered priorities may shape the dimensions along which students evaluate and rank alternatives. Gender inequality may therefore arise because men and women enter the college-choice process with differently structured choice sets, even when they share similar levels of educational ambition.

On the other hand, the translation of preferences into educational decisions may differ by gender. Even when men and women express similar preferences, those preferences may not have identical behavioral consequences. Cultural beliefs about gender, competence, and suitability can shape students' confidence, assessments of their own qualifications, and willingness to pursue uncertain or highly competitive options (Ridgeway 2001; Ridgeway and Correll 2004; DiPrete and Buchmann 2013). Such processes are likely to be particularly consequential when students apply to highly selective universities, where they must assess their chances of admission and weigh the risks of an ambitious application against the security of a less selective option. Thus, the same preference for attending a selective university may result in a more ambitious application for one student but a more cautious application for another. Distinguishing between the content of preferences and their translation into applications is therefore essential for understanding gender differences in college selectivity.

Japanese college admission contexts

Tertiary education in Japan is known for its high level of stratification, as noted in comparative education studies (Shavit et al. 2007). Universities are arranged in a well-established hierarchy based on selectivity, with national and public institutions generally seen as more prestigious, competitive, and higher in quality. In contrast, most private universities are viewed as less selective, with only a few exceptions that enjoy widespread recognition (Yonezawa et al. 2002; Ishida 1998; Ono 2008).³

³ Historically, students aspiring to attend highly selective universities commonly spent an additional year preparing for and retaking the entrance examination. This practice was widely regarded as a conventional pathway to educational advancement and upward social mobility. Research shows that the additional year of preparation—often spent attending specialized cram schools (*yobikō*)—can substantially increase students' chances of gaining admission to selective universities (Tsukada 1991). Although retaking entrance examinations remains relatively common among applicants to elite universities, it has become less prevalent in recent years as demographic decline has reduced the number of students.

Given the stratified nature of higher education in Japan, gaining admission to top-tier schools is highly competitive. This competition is considered worthwhile, as a student's high school ranking significantly influences their chances of getting into prestigious universities, even when accounting for individual ability (Ono 2001). Attending elite universities, in turn, is associated with favorable outcomes in the job market, including higher salaries (Ono 2007; Li et al. 2023), employment at major corporations (Ishida 1998), and better access to leadership positions (Ishida et al. 1997; Ono 2007).

In terms of college admissions, two key institutional features help explain how gender disparities in selective college application might emerge. First, Japan's college admissions system is notably complex, blending two distinct approaches: test-based admissions and holistic admissions. In the test-based route, applicants are evaluated solely on standardized exam scores. In contrast, holistic admissions—similar to the U.S. model—consider a broader range of criteria, such as academic records, extracurricular involvement, and interviews. These holistic admissions often take place earlier than the national standardized exams, earning them the label of “early admissions.”

A key point about this dual-track system is that different universities use these methods to varying degrees. National and public universities—especially elite ones—mostly rely on test-based admissions, while private institutions are increasingly adopting holistic approaches. For example, the University of Tokyo accepts 97% of its students based on standardized test scores, with only 3% entering through holistic evaluations.

Second, applying to selective universities in Japan is a high-stakes and uncertain process. Specifically, admission periods (where exams are conducted) for national and public universities are controlled by the Ministry of Education and extremely limited (up to three periods).⁴ Most elite national universities admit students during the first period, making later chances slim.⁵ To add to the pressure, many of these institutions use a two-step screening process: students must first take a national standardized test, and then—if their score meets the cutoff—apply to individual universities for a second exam. Because these universities often set score thresholds for eligibility, students must carefully match their application choices to their test performance.⁶ While holistic admissions have become more common, especially at private schools, national and public universities still depend heavily on test-based methods.

Such high-stakes and uncertain examinations for admission to national and public universities have two important consequences. First, many students fail the entrance examination and retake it the following year. Second, to reduce the risk of having to spend an additional year preparing

⁴ For example, in the 2020 academic year, national universities offered only two admission rounds, beginning on February 25 and March 12, respectively. Public universities offered one additional round beginning on March 8.

⁵ This system benefits institutions by reducing the risk that students will accept offers from multiple universities, but it places disproportionate costs on applicants. In particular, limiting students to one or two national or public universities may discourage risk-averse applicants from applying to highly selective institutions and instead lead them to choose less selective “safety” schools.

⁶ It is important to note that students who fail the second-stage examination must retake the nationwide exam the following year if they wish to reapply to their preferred universities.

for another attempt, students often apply to private universities as a backup while also sitting for national or public university examinations. (JILPT 2017).⁷

Recent research in behavioral economics and psychology suggests that the structure of Japan's admissions system may itself contribute to gender disparities. Existing evidence indicates that women, on average, exhibit greater risk aversion, lower confidence in their qualifications, and lower preferences for competition (Eckel and Grossman 2008; Niederle and Vesterlund 2011; Soll and Klayman 2004). These tendencies may contribute to lower application rates among women to selective but high-risk universities.

To support this argument, Figure 2 presents the proportion of female applicants and female entrants across all national and public universities. The two proportions are closely aligned, suggesting that the gender gap arises primarily at the application stage rather than during the admissions process.⁸

[Figure 2 about here]

Hypotheses

Drawing from the gendered logic of college choice that distinguishes between gender differences in college choice preferences and the translation of such preferences into educational decisions, as well as the literature on multidimensional nature of educational preferences, our framework leads to four sets of hypotheses about how gender differences emerge across the college choice process. First, prior research on Japanese higher education consistently documents gender differences in college selectivity, with men more likely than women to target highly selective institutions. We therefore expect this gender gap to be visible in students' stated ranked preferences.

Hypothesis 1: Men are more likely than women to list highly selective programs.

Next, our multidimensional approach suggests that focusing only on students' first choices may understate gender differences in college preferences. Even when men and women have similarly selective first choices, their lower-ranked preferences may differ. In particular, women may construct a set of alternatives that includes less selective institutions to increase their chances of admission, whereas men may be more likely to maintain selective options across multiple ranked choices. We therefore expect gender differences to persist in lower-ranked preferences even after accounting for first-choice selectivity.

Hypothesis 2: Even after accounting for first-choice selectivity, men have more selective second- and lower-ranked preferences than women.

⁷ Applicants who are admitted to their second-choice university but not their first-choice institution may also retake the examination the following year if they are dissatisfied with the outcome.

⁸ Information about applicants to private universities is not available in the dataset.

Our third hypothesis concerns whether stated preferences translate into applications differently for men and women. College applications are consequential decisions made under uncertainty about admission, and students may adjust their choices in response to the perceived risk of rejection. Prior research documenting gender differences in confidence and risk-taking suggests that women may respond more strongly to such uncertainty by shifting toward safer, less selective options. If this is the case, gender differences should become more pronounced as students move from stated preferences to actual applications.

Hypothesis 3: The gender gap in program selectivity is larger at the application stage than in students' stated preferences.

Finally, we distinguish between two sources of gender differences in application selectivity: differences in the preferences students hold before applying and differences in how those preferences are translated into applications. If applications largely reflect preferences formed earlier in the college choice process, much of the observed gender gap in application selectivity should be accounted for by students' ranked preferences. At the same time, the uncertainty and strategic considerations involved in actual applications may produce additional gender differences that cannot be captured by stated preferences alone. This leads to two complementary hypotheses:

Hypothesis 4a: Much of the gender gap in application selectivity is explained by gender differences in students' ranked preferences.

Hypothesis 4b: A gender gap in application selectivity remains even after accounting for gender differences in students' ranked preferences.

Data and method

Mock exam data

This study uses restricted data from a nationwide private testing company on high school seniors in the 2023 graduating cohort. A total of 305,714 students took the company's summer mock examination, which was administered around August. Among these students, 22.6% ($n = 68,961$) did not report applying to any university,⁹ while 17.5% ($n = 53,474$) reported applications exclusively through holistic admissions. Excluding these students left 183,279 students who applied to at least one university through test-based admissions and reported information about their applications to the testing company.

Among these students, 86.1% ($n = 157,868$) listed at least one program preference in the summer mock examination and had complete information on the variables used in our analyses. To examine the role of ranked preferences, we further restricted the sample to students who listed at least four ranked program preferences in the summer mock examination. The final analytic

⁹ This number includes both students who applied to universities but did not report their applications and those who did not apply to any university. The dataset cannot distinguish between these two groups.

sample therefore consists of 147,048 students: 79,264 men and 67,784 women. Table 1 presents descriptive statistics for the analytic sample separately by gender.

The results should therefore be interpreted as describing gender differences within this restricted sample, rather than among all high school seniors or all students who took the mock examination. It is also important to note that participation in the mock examination is not random.¹⁰ We therefore combine gender-specific enrollment data from the School Basic Survey with high school ranking data to assess selection into examination participation.¹¹ We then construct sampling weights to account for differential participation by high school rank, prefecture, and gender.

[Table 1 about here]

Key variables

The data on students' ranked preferences and applications cover universities and programs throughout Japan, including national, public, and private institutions. Although the application and admission-outcome data cover both test-based and holistic admissions, we focus on test-based admissions because most students admitted to selective universities—particularly national universities—are admitted through this route. Focusing on a single admissions route also makes our analytical sample more homogeneous. Because we examine test-based admissions, the applications in our analysis were submitted after the nationwide standardized examination, which was administered in January. After students completed the subsequent university-specific examinations, typically around March, the testing company contacted their high schools to collect information about the universities and programs to which they had applied and whether they had been admitted. The application data are based on students' self-reports. Although we cannot independently verify the completeness of these reports, we treat them as comprehensive records of students' test-based applications.

Using these data, we examine gender differences in students' ranked preferences reported in the summer mock examination and in the programs to which they subsequently applied. In the mock examination, students can list up to nine ranked choices, with each choice identifying a university and a department. Unlike actual applications, these rankings are not subject to the formal application restrictions imposed by the admissions system. Students may list programs

¹⁰ Because these data do not come from a random-sample survey, it is important to assess their representativeness. Using the number of applicants who took the national entrance examination, we calculated the share of examinees represented in our dataset for each prefecture. Appendix Figure 1 shows that coverage exceeds 50% in many prefectures but is lower in highly urbanized areas such as Tokyo and Kanagawa. One possible explanation is that students in these areas—particularly those aspiring to attend selective universities—are more likely to attend private cram schools (*juku*) for supplementary education. Because cram schools may administer their own mock examinations, high schools in urban areas may play a less central role in organizing such examinations than schools in other prefectures.

¹¹ Information on high school ranking was not available in the mock exam data, so we obtained it through web scraping.

from national, public, and private universities and may list different departments within the same university. This latter practice is more common for private universities, where students may apply to multiple programs, whereas applicants to national and public universities are generally restricted to a much smaller number of programs, typically one or two depending on the admission period. The nine-choice limit is therefore a feature of the mock-examination design rather than an admissions-system restriction. We consider both universities and departments because applicants in Japan typically choose their field of study before entering college, with entrance examinations tied to specific university departments (Roth 2019).¹² We therefore use the term program to refer to a specific university–department combination.

The summer rankings thus provide a broader, although not unrestricted, measure of students' stated preferences than their subsequent applications. In particular, students may list several national or public university programs in the mock examination even though they can ultimately apply to only a limited number of them. The rankings may therefore capture a wider set of preferred alternatives than can be observed in students' final applications. Consistent with this interpretation, Table 1 shows that students listed more programs in the summer mock examination than they subsequently applied to: 6.83 versus 4.33 among men and 7.02 versus 4.32 among women.

We measure program selectivity using the standardized score known as Hensachi, or the deviation score, assigned by the testing company to each university–department program. These scores are calculated from the distribution of mock-examination scores among students applying to each program and are intended to measure admission competitiveness. For ease of interpretation, we transform the Hensachi scores into percentile ranks. Throughout the paper, selectivity therefore refers to admission competitiveness rather than to an institution's educational quality more generally.¹³

Method

Our first set of analyses examines gender differences in the ranked preferences reported in the summer mock examination. We consider both (1) unadjusted gender differences across all ranked preferences and (2) gender differences in second- and lower-ranked preferences after accounting for students' first-choice preferences. Based on prior research documenting gender differences in educational aspirations, we expect substantial unadjusted gender differences. However, it remains unclear whether second- and lower-ranked preferences also differ between men and women after accounting for their first-choice preferences. Any remaining differences

¹² As a result, students' majors are typically determined at the time of admission, and switching departments after enrollment is relatively uncommon (Itō and Hoshi 2020).

¹³ Note that *Hensachi* is not available for every university–department program. To assign a *Hensachi* score, the testing company needs information on the distributions of both admitted and rejected applicants. If either distribution is unavailable—for example, because no students applied or because all applicants were admitted—the *Hensachi* score cannot be calculated. Consequently, *Hensachi* scores are not assigned to institutions with extremely low selectivity, including those that attract few or no applicants. Nevertheless, some students may still apply to such universities through the general entrance-examination route, though the number is small. Among the 183,279 students remaining after the summer mock examination records were linked to admissions results and students who applied exclusively through holistic admissions were excluded, only 3.6% had first-choice programs that did not include a *Hensachi* score.

may contribute to the gender gap in applications to selective programs, even among students whose first-choice aspirations are similarly selective.

In analysis, we estimate the selectivity of student i 's j -th ranked program (y_{ij}) as follows:

$$y_{ij} = \alpha + \beta Female_i + \sum_{j \geq 2} \gamma_j Rank_j + \sum_{j \geq 2} \delta_j Female_i \times Rank_j + \mathbf{X}'_i \boldsymbol{\tau} + u_{ij} \quad (1)$$

where α is an intercept, $Female_i$ indicates a female dummy, and $Rank_j$ indicates j -th ranked program dummies. $\mathbf{X}_i$ indicates controls including academic achievement in the summer mock exam, prefecture, high school rank, whether students are on STEM or non-STEM-track, and neighborhood socioeconomic status based on the school location.¹⁴ Gender differences in the selectivity within a given ranked program is captured by an interaction coefficient δ_j .

We next examine whether men and women differ in their lower-ranked preferences even when they share the same first-choice preference. To do so, we add the first-choice program to the matching variables and estimate gender differences in second- and lower-ranked preferences among students with the same first choice. The models include first-choice selectivity and its association with the selectivity of each subsequent choice. The equation is as follows.

$$y_{ij} = \alpha + \beta Female_i + \sum_{j \geq 3} \gamma_j Rank_j + \sum_{j \geq 3} \delta_j Female_i \times Rank_j + \theta Selec_i + \mathbf{X}'_i \boldsymbol{\tau} + u_{ij}, \quad \text{where } j \geq 2 \quad (2)$$

Here, $Selec_i$ indicates the first-choice selectivity, and θ is a coefficient indicating the association between first-choice selectivity and j -th-choice selectivity.

Our second set of analyses provides counterfactual estimates of the extent to which stated preferences explain gender differences in the selectivity of students' final applications. We focus on the most selective university program to which each student applied, because this measure captures students' access to selective higher education and is directly related to the gender disparity in selective university attendance discussed above.

Specifically, we distinguish between two sources of the observed gender gap in application selectivity: (1) differences in stated preferences reported in the summer mock examination and (2) differences in how men and women translate those preferences into applications. The first counterfactual estimates the gender gap that would remain if men and women had the same distribution of stated preferences in the summer examination. The second additionally equalizes the relationship between stated preferences and subsequent applications, estimating the gap that would remain if men and women had both the same preferences and the same application behavior conditional on those preferences. The remaining difference between this second counterfactual and the observed gender gap may reflect processes occurring after the summer examination, including changes in academic achievement or other later developments.

¹⁴ This measure was constructed using the share of the university-educated population in the neighborhood where each school is located, based on data from the 2020 Population Census.

We implement this analysis using the generalized sequential Kitagawa–Oaxaca–Blinder descriptive decomposition proposed by Opacic et al. (2026). After adjusting for the control variables used in the first set of analyses, we estimate how much the gender gap in the selectivity of final applications would be reduced if the distributions of students’ first-, second-, third-, and fourth-or-lower-ranked preferences were equalized between men and women. The generalized sequential KOB decomposition is particularly well suited to this purpose for two reasons. First, its sequential structure allows us to isolate the incremental contribution of preferences at each rank. For example, we can estimate the contribution of second-choice preferences after accounting for first-choice preferences and then estimate the additional contribution of third-choice preferences. This enables us to identify the distinct contribution of preferences at each rank to the gender gap in final application selectivity. Second, because the decomposition is nonparametric, it is less sensitive to model misspecification.

Formally, let $G \in \{M, W\}$ denote gender, where M and W refer to men and women, respectively; let Y denote the maximum selectivity percentile among the university programs to which a student applied; and let $\mu_g = \mathbb{E}[Y \mid G = g]$ for $g \in \{M, W\}$. Suppose that $L_1, \dots, L_J$ are ordered blocks of explanatory variables. We define the cumulative set as $\mathcal{L}_j = (L_1, \dots, L_j)$, with $\mathcal{L}_0 = \emptyset$. For each $j = 0, \dots, J$, the standardized mean based on women’s conditional outcome function and men’s distribution of the cumulative covariate set is

$$\mu_{W,j}^{\text{pred}} = \mathbb{E}[\mathbb{E}(Y \mid G = W, \mathcal{L}_j) \mid G = M]$$

The observed male–female gap is

$$\Delta = \mu_M - \mu_W$$

It can be written as the sum of a residual component and the component statistically accounted for by the included blocks:

$$\Delta = (\mu_M - \mu_{W,J}^{\text{pred}}) + (\mu_{W,J}^{\text{pred}} - \mu_W)$$

Because $\mu_{W,0}^{\text{pred}} = \mu_W$, this expression separates the residual and statistically explained components:

$$\Delta = \Delta_{\text{Residual}} + \Delta_{\text{Explained}} = (\mu_M - \mu_{W,J}^{\text{pred}}) + (\mu_{W,J}^{\text{pred}} - \mu_{W,0}^{\text{pred}}).$$

The explained component is further decomposed into the incremental contribution of each ordered block:

$$\Delta_{\text{Explained}} = \sum_{j=1}^J \Delta_{\text{Explained}, L_j} = \sum_{j=1}^J (\mu_{W,j}^{\text{pred}} - \mu_{W,j-1}^{\text{pred}}).$$

In our application, L_1 contains control variables (), L_2 contains first-choice selectivity, L_3 contains second-choice selectivity, L_4 contains third-choice selectivity, and L_5 contains the mean

selectivity of fourth- and lower-ranked preferences. Thus, $\mu_{W,j}^{\text{pred}} - \mu_{W,j-1}^{\text{pred}}$ measures the portion of the male–female application-selectivity gap statistically accounted for by adding block L_j , conditional on the preceding blocks. The remaining term, $\mu_M - \mu_{W,j}^{\text{pred}}$, is the residual disparity not statistically accounted for by the included blocks. The residual can be interpreted as the gender gap that remains unexplained even after accounting for students’ summer preferences.

Results

Gender differences in the stated preferences

Figure 3 shows the gender gap in the selectivity of the programs students listed as their preferred choices in the summer mock examination, from the first- to the ninth-ranked preference, estimated using Equation (1). Regression estimates with 95% confidence intervals are reported in Appendix Table 1. Positive values indicate that male students listed more selective programs than female students. The gender gap is largest for students’ first choice, at approximately 4.55 points, and generally narrows as the preference rank increases, reaching roughly 2.53 points by the ninth choice. Although the pattern is not strictly monotonic—with the gap increasing at the sixth-ranked preference—the smoothed trend indicates an overall decline in the gender gap across preference ranks. At the same time, the number of students reporting a preference at each rank declines substantially at lower ranks. Approximately 90% or more of students of each gender report preferences through the fourth rank, whereas the sample declines more sharply thereafter, particularly beyond the fifth rank. Given this pattern, the subsequent analyses focus on students who reported at least four ranked preferences. This restriction allows us to examine gender differences across a common set of preference ranks while retaining the large majority of the analytic sample.

[Figure 3 about here]

To further explore the multidimensional nature of preferences, Figure 4 presents gender differences in second- and lower-ranked preferences, with and without controlling for first choice, estimated using Equations (1) and (2), respectively. Appendix Table 2 reports the corresponding regression estimates with 95% confidence intervals. The purple line replicates the results shown in Figure 3, whereas the green line shows the residual gender differences after accounting for gender differences in first choice. As the figure shows, gender differences in lower-ranked preferences remain substantial even after accounting for first choice. For example, the approximately 4.18-percentile-rank-point difference between male and female students in their second choice declines to 1.75 percentile-rank points after controlling for first choice. Other ranked preferences show similar residual differences of approximately 2–3 percentile-rank points. This indicates that, even among students who aspire to similarly selective programs as their first choice, female students are still less likely to list selective programs as their second and subsequent choices. These residual differences are important because they may help explain the

gender gap in applications to selective universities, even among students who report similarly selective first-ranked preferences in the summer mock examination.

[Figure 4 about here]

How preferences translate into behaviors differently by gender

Next, we shift our focus to how students' stated ranked preferences in the summer mock examination translate into applications and how this process differs between men and women. We first describe changes in the selectivity of the programs to which students apply. The literature on gender differences in confidence suggests that women may be more risk-averse in college applications, particularly in high-stakes contexts such as Japan. We might therefore expect the gender gap in selectivity to widen between the mock-examination and application stages if women switch to safer programs.

Figure 5 presents the density distribution of the difference between the most selective program to which each student applied and their first-ranked program in the summer mock examination. We show the distributions separately for men and women. We also report gender-specific proportions of students who applied to programs with similar selectivity, higher selectivity, or lower selectivity than their first-ranked program.

Overall, the majority of both male and female students applied to programs with selectivity similar to that of their stated preference in the mock examination, as indicated by the concentration of the density around zero. At the same time, a substantial number of students either increased or decreased the selectivity of their target programs. On the one hand, some students applied to considerably more selective programs than those they had listed as their first choice, as indicated by the right tail of the distribution. On the other hand, others applied to considerably less selective programs, as indicated by the left tail. Although evidence on this behavior is largely anecdotal, some students in Japan take the entrance examination for a highly selective university despite having a low probability of admission, viewing the experience as a memorable challenge or personal milestone. The former group may include such students. The latter group, by contrast, may consist of students who revise their application plans downward as they acquire more information about their academic prospects.

Importantly, these patterns differ by gender. First, women are more likely than men to apply to a similarly selective university (30% versus 25%), where "same" is defined as having a selectivity score identical to the first decimal place. Second, men are more likely to change the selectivity of their applications relative to their stated preferences in the mock exam. They are more likely either to raise (27% versus 25%) or lower (48% versus 45%) the selectivity of the programs to which they apply. In contrast to this expectation about the gender difference in risk preference, results indicate that men are more likely to switch to less selective programs. One potential interpretation is that female students have already largely settled on their intended schools by the summer mock exam, whereas male students continue to explore different possibilities.

[Figure 5 about here]

We further estimate counterfactual gender differences in the maximum selectivity of the programs to which students applied under several scenarios. Results are shown in Figure 6. The baseline specification reports the gender difference in the maximum selectivity of applied programs, conditional on observable characteristics measured in the summer mock examination, including exam score, region, and high school. It therefore represents the gender difference net of pre-existing correlates of selective university application. We then sequentially account for gender differences in students' stated preferences in the summer mock examination. The "+ First choice" specification additionally aligns women's first-ranked preferences with those of comparable men. The "+ Second choice," "+ Third choice," and "+ Fourth choice or more" specifications sequentially add the second-, third-, and fourth-or-lower-ranked preferences. For the final block, we use the mean selectivity of programs ranked fourth or lower. Details of the counterfactual procedure are provided in the Methods section.

Here, we examine how the gender difference in the selectivity of the most selective program to which students applied changes as we sequentially account for their stated university preferences in the summer mock examination. Among students with comparable characteristics measured before or during the summer mock examination—including region, high school, and mock-examination performance—men applied to programs that were, on average, 2.37 percentile-rank points more selective than those to which women applied. The substantive meaning of this difference varies across the selectivity spectrum. For example, a two-percentile-rank-point gap separates the economics program at the University of Tokyo (99.8th percentile) from the English program at Tokyo University of Foreign Studies (97.8th percentile). At a lower point in the distribution, the same-sized gap separates the economics program at Hiroshima University (83.7th percentile) from the education program at Saitama University (81.7th percentile).

Compared with the gender gap in first-choice selectivity in the summer mock examination, the conditional gap in application selectivity narrows from 4.55 to 2.37 percentile-rank points. Descriptively, the corresponding gap in the selectivity of the most selective applied program is 2.8 points (see footnote below). This narrowing reflects the fact that men are more likely to move to less selective programs than to more selective programs, as shown in Figure 5.¹⁵ As discussed below, this pattern is inconsistent with Hypothesis 3.

Accounting for students' summer first-choice preferences substantially reduces the gap to 1.34 percentile-rank points, suggesting that gender differences in first-choice preferences account for 43.5% of the initial gap. Substantively, the remaining difference is comparable to the gap between the economics program at the University of Tokyo and the human sciences program at Osaka University among highly selective institutions, or between the economics program at

¹⁵ Descriptively, the average selectivity score (percentile rank) of the first-ranked school in the summer mock exam was 78.9 for men and 75.8 for women, producing a gender gap of 3.1 percentile-rank points as shown in Table 1. At the application stage, the average selectivity of the most selective program to which students applied was 75.4 for men and 72.6 for women. As a result, the gender gap in application selectivity narrows to 2.8 percentile-rank points.

Hiroshima University and the education program at Fukuoka University of Education among moderately selective institutions.

Sequentially accounting for lower-ranked choices further narrows the gap. The difference falls to 1.13 percentile-rank points after accounting for second choices, 1.00 point after accounting for third choices, and 0.69 points after accounting for fourth and lower choices. In relative terms, second- and third-choice preferences account for an additional 8.9% and 5.5% of the initial gap, respectively, while fourth-or-lower choices account for a further 13.1%.

In total, 70.9% of the gender gap in applications to selective university programs among otherwise similar men and women is accounted for by differences in preferences expressed in the summer mock examination. Conversely, approximately 30% of the gap remains unaccounted for. This residual difference indicates that even men and women with similar academic characteristics and similar stated university preferences ultimately apply to programs that differ in selectivity.

The role of fields of study and proximity

These results indicate that gender differences in application selectivity are strongly associated with preferences expressed in the summer—particularly students’ first choices—but are not fully explained by them. They also underscore the multidimensional nature of educational preferences. Students differ not only in how they rank programs along a common dimension, such as selectivity, but also in the importance they attach to other characteristics of colleges. As discussed above, women may be more likely to navigate multiple, potentially competing priorities when evaluating educational options. These priorities may narrow the set of institutions they perceive as suitable or feasible and increase the importance of fit relative to selectivity.

Two dimensions that may contribute to this pattern are field of study and geographic proximity. First, gendered assumptions about educational and occupational domains can shape students’ perceptions of which fields are appropriate for men and women (Charles and Bradley 2009). Evidence from Japan, consistent with findings from other contexts reviewed above, suggests that gender stereotypes shape perceptions of suitable fields of study (Froehlich et al. 2022; Ikkatai et al. 2020). Such perceptions may influence not only students’ field preferences but also the range of institutions they consider when particular fields are offered only at certain universities.

Second, geographic proximity represents another dimension of college choice that may be shaped by gendered expectations (Lor 2023; McDonough 1997). Such expectations may be especially salient in East Asian societies, including Japan, where daughters are often viewed as important sources of future emotional and practical support. Studies documenting a growing preference for daughters over sons in South Korea and Japan support this interpretation (Chun and Das Gupta 2022; Fuse 2013), while other research suggests that parents who anticipate future care needs may prefer their daughters to live nearby (Ishikawa 2009; Okuda 2022). In Japan, these expectations may make female students more likely to be encouraged—or expected—to attend universities within commuting distance of their parents’ home (Emori and Kawasaki 2024). Geographic constraints of this kind may further narrow women’s choice sets and make highly selective institutions less attainable when they are located far from home.

These arguments suggest that incorporating additional dimensions of stated preferences—namely, fields of study and geographic proximity—may help explain the gender gap in applications to selective colleges. We examine this possibility by sequentially incorporating each dimension into the analysis. For fields of study, we first include dummy variables representing students’ first-choice fields. We use the most detailed classification available in the mock-examination data, which distinguishes among 18 fields (see Appendix Table 3 for the full list). We then include the share of lower-ranked preferences that fall within the same field as students’ first choice. This measure captures the extent to which students’ preferences are concentrated within a particular field. Based on research emphasizing the importance of occupational expectations in shaping gendered educational trajectories, we expect women to be more likely to list programs in the same field across their ranked preferences (Weeden et al. 2020).

We next incorporate geographic proximity, operationalized as whether each program listed in the mock examination is within commuting distance of the student’s home. To construct this measure, we use the commuting zones developed by Adachi et al. (2021).¹⁶ As with fields of study, we also include the share of lower-ranked preferences consisting of programs within commuting distance. Appendix Table 4 shows the share of programs within commuting distance, separately by gender. Although the difference is not large, women are slightly more likely than men to list programs within commuting distance. For example, among first-choice programs, 34.0% of women list a program within commuting distance, compared with 33.2% of men. The gender gap appears to widen for lower-ranked preferences.

Results indicate that accounting for students’ first-choice field reduces the gender gap by 0.38 percentile-rank points, from 0.69 to 0.31. The gender-specific distribution of first-choice fields shown in Appendix Table 3 indicates that women are more likely to choose humanities and social sciences, education, and health and medical fields, including nursing and pharmacy, whereas men are more likely to choose engineering, science, and economics. Contrary to our expectations, accounting for geographic proximity—defined as whether a program is within commuting distance of a student’s home—does not explain the gender gap. This is likely because men and women list programs with similar commuting distances in the nationwide mock examination, as shown in Appendix Table 4. Similarly, adding the share of lower-ranked preferences within the same field or commuting status does not further change the results. This suggests that students who select the same field or commuting status as their first choice tend to make similar selections along these dimensions in their subsequent choices, regardless of gender.

[Figure 6 about here]

Sensitivity analyses

¹⁶ We define a municipality as within commuting distance of a high school if at least 1% of commuters from the municipality in which the high school is located commute to that municipality, based on the commuting patterns reported in Adachi et al. (2021).

Although our analyses control for a range of pre-existing characteristics, including academic achievement as measured in the mock examination, they do not capture developments occurring between the mock examination and the application period. For example, some students may experience slower-than-expected academic progress and consequently apply to substantially less selective universities than those they initially identified. As shown earlier in Figure 5, some students apply to programs that differ substantially in selectivity from those they listed in the summer mock examination.

Regardless of the underlying mechanisms, these extreme cases may influence our main results. To address this concern, we replicate the decomposition results presented in Figure 6 after excluding cases in which the absolute difference between the selectivity of the most selective program to which a student applied and that of their first-choice program in the summer mock examination exceeded three standard deviations. The results are shown in Appendix Figure 2. The baseline gender difference was slightly larger, while the proportion of the gender gap explained by factors such as first-choice preferences increased slightly. Overall, however, excluding these cases does not change the general pattern.

Discussion

Building on research on the gendered logic of college choice, this study examined when gender differences in applications to selective colleges emerge by distinguishing students' stated preferences in a summer mock examination from their subsequent application decisions. Although previous research has raised concerns that women apply to less selective institutions than similarly qualified men, it remains unclear whether this pattern primarily reflects gender differences in preferences formed before the application stage or differences in how those preferences are translated into applications. Our findings point to the importance of both processes, while revealing a more complex pattern than conventional accounts of gendered risk-taking would predict.

First, consistent with Hypothesis 1, men list more selective programs than women in the summer mock examination, even after accounting for academic achievement, school context, and other characteristics measured before the examination. These differences extend beyond students' first choices to their broader preference rankings, although they tend to narrow among lower-ranked choices. Moreover, consistent with Hypothesis 2, gender differences in second- and lower-ranked preferences remain even after accounting for first-choice selectivity. Men and women who initially state preferences for similarly selective programs therefore construct different sets of alternatives. This finding highlights the importance of conceptualizing college preferences as multidimensional rather than relying exclusively on students' first choices.

Second, the transition from stated preferences to applications does not follow the pattern predicted by Hypothesis 3. Based on prior research on gender differences in confidence and risk-taking, we expected women to shift more strongly toward less selective options as the high-stakes application stage approached, thereby widening the gender gap. Instead, the gap narrows. Although the two measures are not exactly comparable—the summer measure captures students' first-ranked programs, whereas the application measure captures the most selective program to which they applied—men are more likely than women to apply to programs that are less

selective than their first-choice programs in the summer. Thus, the transition from stated preferences to applications reduces, rather than amplifies, the initial gender gap in selectivity.

Finally, the decomposition results support both Hypotheses 4a and 4b. Consistent with Hypothesis 4a, approximately 70% of the gender gap in application selectivity is statistically accounted for by gender differences in preferences expressed in the summer. First-choice preferences alone account for approximately 44% of the initial gap, while incorporating second-, third-, and lower-ranked choices progressively accounts for an additional share. At the same time, consistent with Hypothesis 4b, approximately 30% of the gap remains after accounting for students' broader preference rankings. Men and women with comparable academic characteristics and similar stated preference profiles therefore still apply to programs that differ in selectivity. Gender inequality in selective applications thus reflects both differences embedded in preferences before the application stage and gender differences in how those preferences are translated into applications, even though the latter process does not widen the aggregate gender gap.

Although our analyses cannot directly identify the mechanisms underlying this residual behavioral difference, one possibility is that women perceive a narrower choice set because they must accommodate multiple priorities and therefore place less emphasis on maintaining a consistent level of selectivity across their choices. These priorities may include balancing anticipated work and family responsibilities and selecting a field aligned with future career plans. Our additional analyses indicate that incorporating stated field-of-study preferences further increases the share of the gender gap statistically accounted for by preferences. These results are consistent with the possibility that, when attempting to satisfy multiple priorities, women perceive a narrower set of institutions as suitable or feasible and place greater emphasis on fit than on selectivity.

At the same time, other explanations remain possible. Men and women may respond differently to admission risks or to information that becomes available between the summer mock examination and the application stage. They may also differ in how they construct application portfolios under conditions of uncertainty and institutional constraint. Importantly, these mechanisms concern the portion of the application gap that remains after accounting for summer preferences, rather than the gender gap as a whole. Moreover, because the aggregate gender gap narrows between the summer and application stages, any explanation based on gender differences in risk-taking must account for why men appear to adjust their applications downward more than women relative to their initial first choices.

Distinguishing among these mechanisms is an important task for future research. One promising approach would be to compare application behavior across institutional sectors characterized by different admissions environments. In Japan, admissions to national and public universities generally involve greater uncertainty because applicants face substantial restrictions on the number of institutions to which they may apply during the main admissions round. Private universities, by contrast, typically offer multiple application opportunities, reducing the consequences of any single admission decision. If the residual gender difference reflects responses to admission risk, the relationship between stated preferences and applications should vary systematically across these institutional settings. Examining such variation could clarify how admissions structures shape gendered adjustments during the application process.

These findings have important implications for understanding the sources of gender inequality in selective college applications. When stated preferences are measured solely in terms of institutional selectivity, focusing exclusively on either aspirations or application behavior provides an incomplete account of how gender disparities emerge. The substantial contribution of summer preferences indicates that processes shaping students' educational orientations well before applications are submitted are central to the gender gap. At the same time, the residual difference after accounting for these preferences identifies the application stage as another consequential point of divergence. Our additional analyses further demonstrate the value of conceptualizing stated preferences as multidimensional, encompassing not only institutional selectivity but also fields of study. Accounting for these dimensions increases the share of the gap statistically accounted for by preferences and may therefore alter our assessment of the relative importance of preference formation and behavioral differences in the translation of preferences into applications.

More broadly, our findings contribute to research on educational decision-making by conceptualizing preferences as ranked configurations of alternatives rather than as a single aspiration observed at one point in time. Existing studies often operationalize educational preferences using students' first or highest-ranked choice. Yet gender differences extend throughout students' ranked preferences, and choices beyond the first provide additional information about subsequent applications. Although first-choice preferences account for the largest share of the application gap, incorporating lower-ranked preferences progressively reduces the remaining difference. A single measure of students' highest aspiration may therefore obscure meaningful variation in the broader set of alternatives they consider.

Our comparison of summer preferences with subsequent applications also highlights the dynamic nature of college choice. Preferences expressed months before applications are submitted do not map mechanically onto eventual application portfolios. Students continue to evaluate and revise their options as they encounter new information, constraints, and risks. Our findings suggest that this adjustment differs by gender, even as the aggregate gender gap in selectivity narrows. Educational preferences should therefore be understood neither as fixed dispositions nor as fully determining subsequent choices, but as evolving configurations that are updated throughout the admissions process.

This perspective also contributes to recent discussions about the relationship between preferences and institutional constraints. As Alon and colleagues argue, stated educational preferences are intertwined with the institutional conditions under which they are elicited (Alon and DiPrete 2015; Gelbgiser and Alon 2024, 2025). Preferences reported in a summer mock examination capture students' alternatives before they finalize their applications and before many immediate application constraints become binding. The fact that these preferences statistically account for a substantial majority of the eventual gender gap indicates that gendered college choice is already well underway by the summer. At the same time, the residual gap demonstrates that the institutional and strategic conditions encountered later also matter. Comparing preferences and behavior across stages therefore helps reveal how preference formation and subsequent adjustment jointly shape inequality in selective applications.

These findings also suggest that reducing gender disparities in selective college applications may require attention at multiple points in the college-choice process. Efforts to reduce gender

differences in aspirations and in the range of institutions students consider remain important because most of the application gap is statistically accounted for by preferences already expressed by the summer. Such efforts, however, may not eliminate the disparity entirely. Even among students with similar stated preferences, gender differences in application selectivity remain. Better information about admission probabilities and application strategies may help students make application decisions that more closely reflect their preferences, although identifying appropriate interventions requires further evidence on the mechanisms producing this residual gap. The current study opens new avenues for research along these lines.

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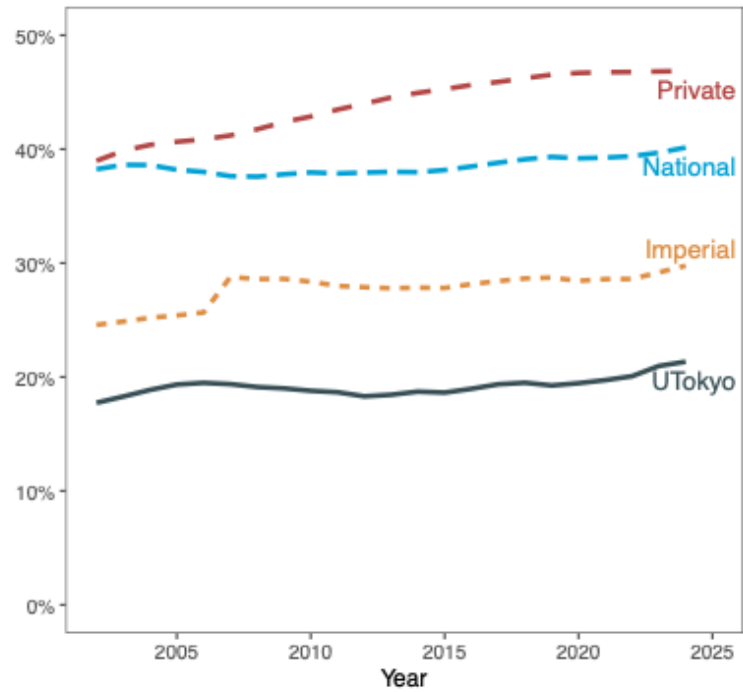
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Source: School Basic Survey, National Institution for Academic Degrees and Quality Enhancement of Higher Education, and author's own calculation based on demographic information provided by each university

Figure 1. Share of female students by institution type

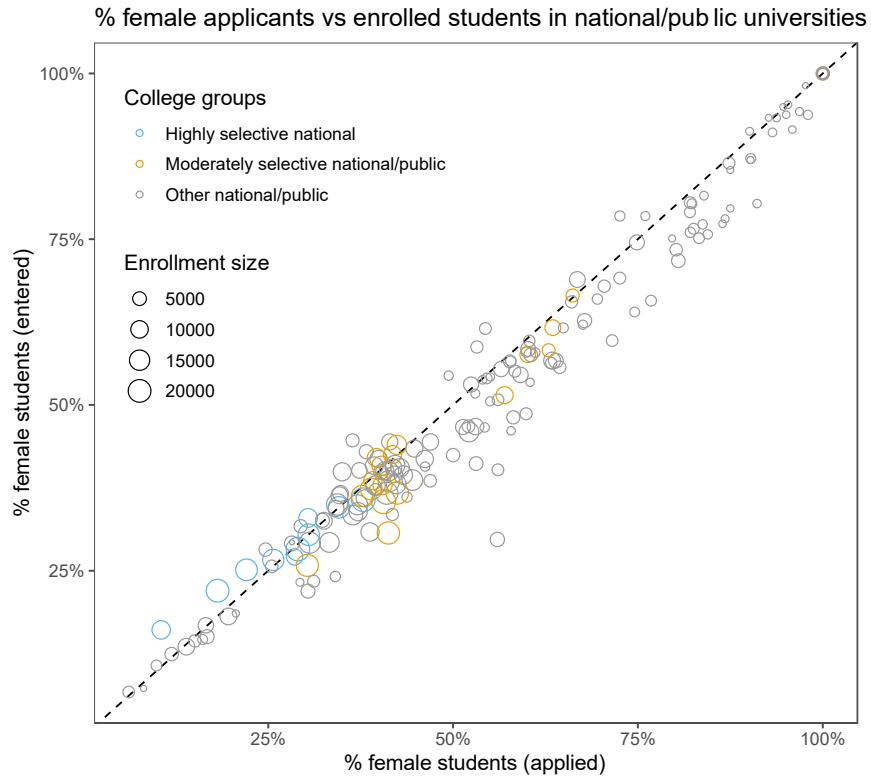


Figure 2. The share of female applicants and entrants at national and public universities

Table 1. Descriptive statistics by gender

	Men		Women	
	Mean / %	SD	Mean / %	SD
A. Academic background				
Summer mock-exam achievement (percentile rank)	54.4	27.4	54.4	25.4
STEM track (%)	57.4	49.4	40.5	49.1
B. Summer aspirations				
First-ranked summer program (percentile rank)	78.9	20.2	75.8	20.9
Number of stated preferences	6.83	2.09	7.02	1.96
C. Applications				
Most selective application (percentile rank)	75.4	21.7	72.6	22.1
Number of applications	4.33	3.19	4.32	2.95
D. Context				
High school selectivity decile (%)				
1	0.2		0.1	
2	0.4		0.3	
3	0.6		0.5	
4	1.6		1.0	
5	3.4		2.5	
6	5.5		4.6	
7	9.8		9.0	
8	17.0		15.9	
9	28.8		31.0	
10	32.8		35.0	
Region (%)				
Hokkaido and Tohoku	10.5		11.2	
Greater Tokyo*	16.0		15.1	
Other Kanto	6.5		6.3	
Chubu	29.2		29.0	
Kinki	15.2		13.5	
Chugoku	8.4		9.0	
Shikoku	3.0		3.7	
Kyushu and Okinawa	11.2		12.2	

Note: Greater Tokyo (*) includes Tokyo, Saitama, Chiba, and Kanagawa.

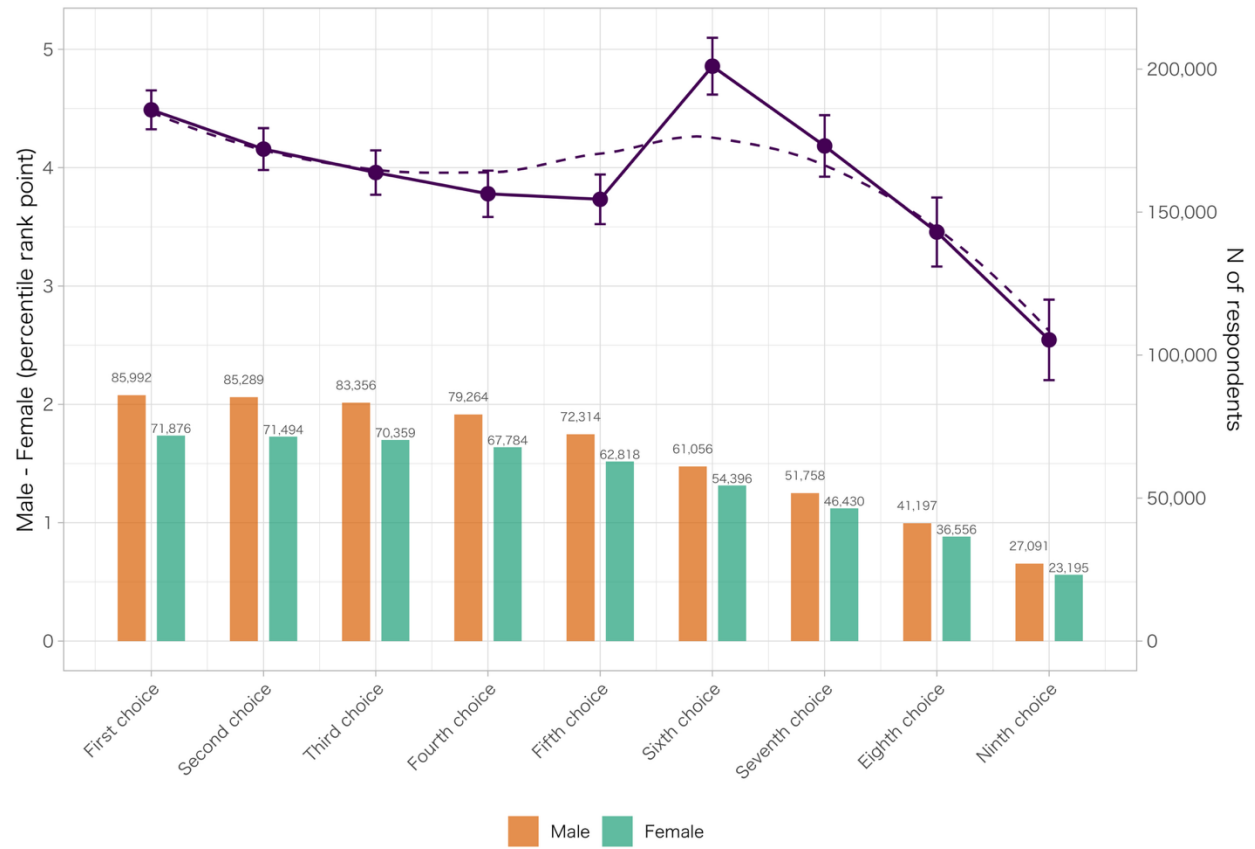


Figure 3. Gender gap in program selectivity across ranked preferences

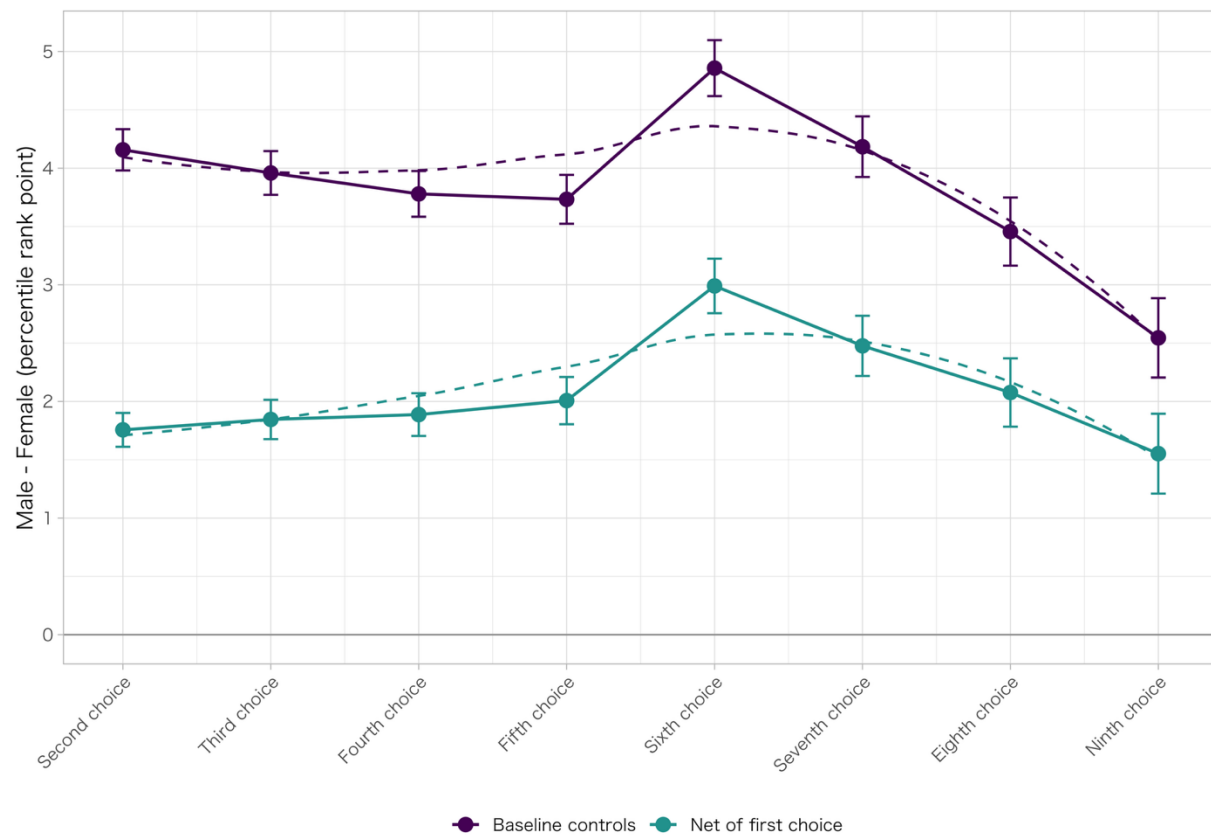


Figure 4. Gender differences in ranked preferences, with and without accounting for first choice

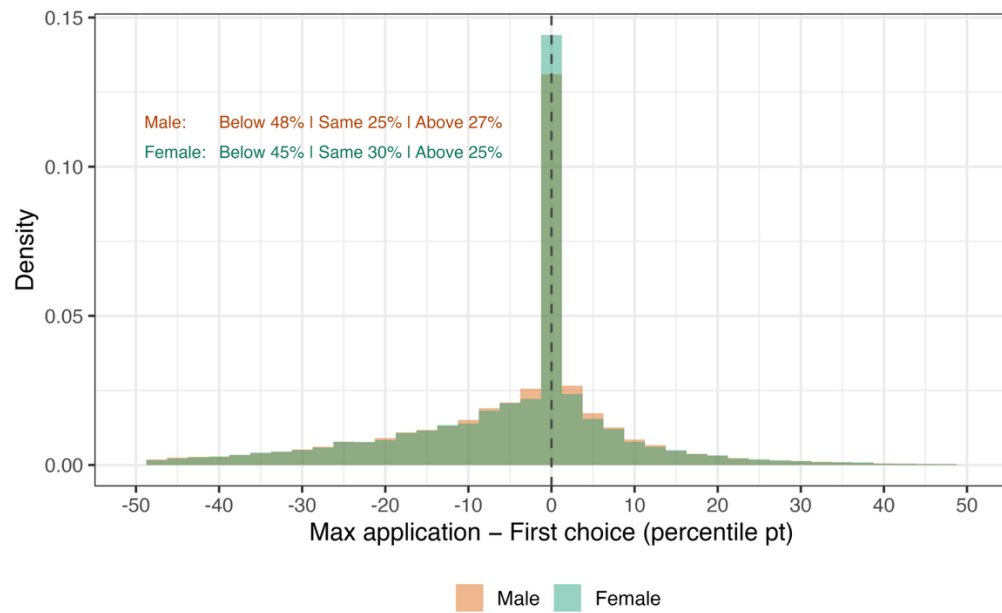


Figure 5. Changes in program selectivity from summer mock-exam first-ranked preferences to college applications, by gender

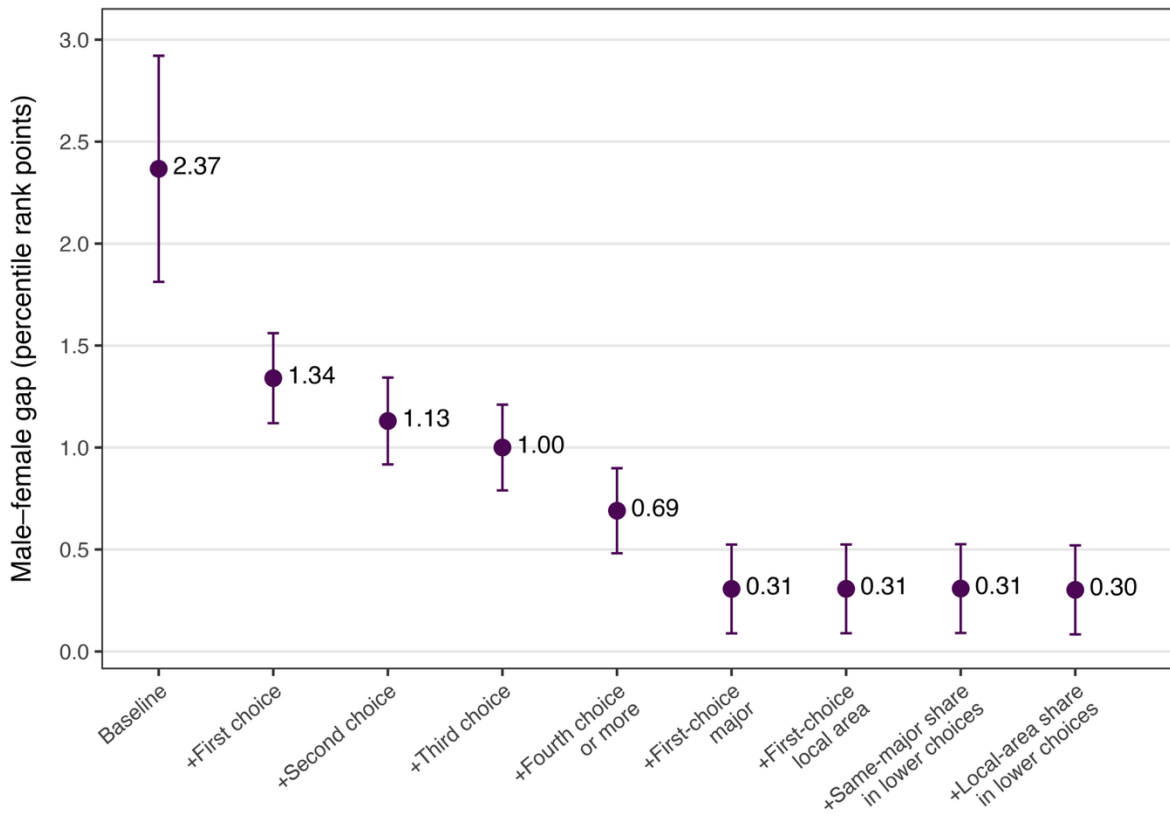
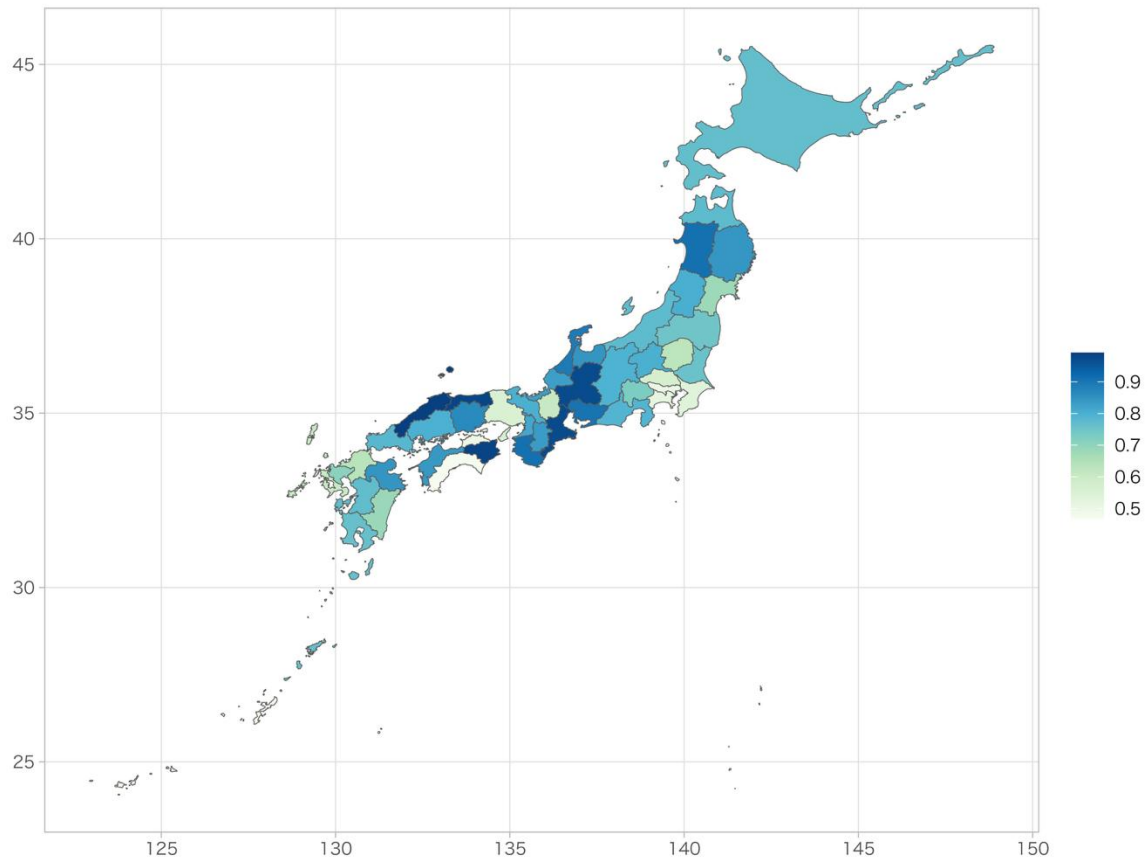


Figure 6. Gender gap in university application selectivity after accounting for summer application preferences

Appendix materials



Note: The distribution is calculated by dividing the proportion of samples in the dataset by the number of nationwide exam applicants across prefectures.

Appendix Figure 1. Distribution of respondents across prefectures

Appendix Table 1. Gender gap in selectivity in ranked preferences

Preference rank	Estimate	95% confidence interval	
		Lower	Upper
1	4.550	4.391	4.708
2	4.179	3.992	4.365
3	3.919	3.741	4.098
4	3.800	3.604	3.997
5	3.735	3.522	3.949
6	4.844	4.592	5.097
7	4.167	3.894	4.440
8	3.438	3.154	3.723
9	2.530	2.165	2.895

Notes: Estimates are male minus female, in percentile-rank points.
Positive values indicate higher selectivity among men.

Appendix Table 2. Gender gap in lower ranked preferences with and without considering the first-choice

Preference rank	Baseline controls			Net of first choice		
	Estimate	95% confidence interval		Estimate	95% confidence interval	
		Lower	Upper		Lower	Upper
2	4.179	3.992	4.365	1.748	1.596	1.899
3	3.919	3.741	4.098	1.796	1.623	1.969
4	3.800	3.604	3.997	1.928	1.748	2.109
5	3.735	3.522	3.949	2.051	1.848	2.253
6	4.844	4.592	5.097	2.960	2.710	3.210
7	4.167	3.894	4.440	2.453	2.190	2.717
8	3.438	3.154	3.723	2.080	1.781	2.379
9	2.530	2.165	2.895	1.568	1.194	1.941

Notes: Estimates are male minus female, in percentile-rank points. Positive values indicate higher selectivity among men.

Appendix Table 3. Eighteen first-choice fields and lower-ranked same-field preferences by gender

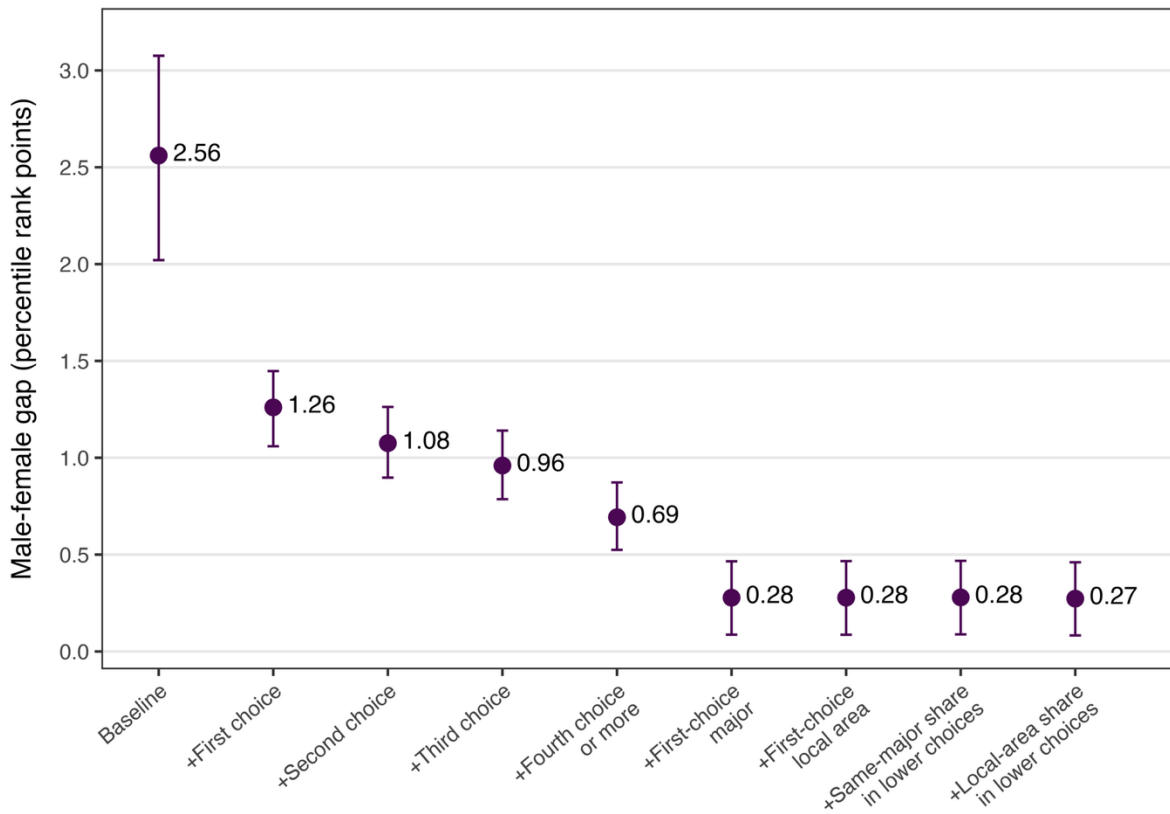
First-choice field	First-choice share (%)		Same-field share (%)		Mean program selectivity (percentile rank)
	Men	Women	Men	Women	
Literature and humanities	9.1	19.6	62.5	67.5	85.1
Social and international studies	4.8	10.0	34.4	44.4	81.1
Law and politics	6.9	5.9	62.1	64.4	87.2
Economics, business and commerce	17.7	10.6	77.5	71.9	79.8
Education (teacher training)	5.1	7.9	40.8	39.9	67.6
Education (comprehensive sciences)	0.5	0.6	5.2	5.9	77.4
Science	6.6	3.0	58.3	53.8	81.0
Engineering	30.3	7.7	82.1	70.5	78.3
Agriculture	4.0	4.7	58.1	58.7	73.5
Human life sciences and home economics	0.3	2.9	38.3	66.1	55.4
Arts and sports sciences	1.8	2.5	55.9	59.9	56.9
Interdisciplinary, environmental, information and human studies	4.2	3.7	18.8	19.8	76.3
Medicine	3.5	3.2	64.3	64.5	96.3
Dentistry	0.2	0.3	51.6	53.0	78.3
Pharmacy	2.0	4.0	62.2	71.8	81.1
Nursing	0.6	9.1	80.6	92.2	53.6
Medical technology	2.4	4.0	73.3	75.5	60.0
Health, welfare and other	0.1	0.3	2.5	15.6	63.7

Notes: First-choice shares use all students of the same gender as the denominator. Rounded shares may not sum to 100%. The overall mean of the field-specific program selectivity scores is 77.57 percentile-rank points. Gray-shaded areas indicate that the share is 2% larger than that of the opposite gender.

Appendix Table 4. Program choices within the school-based commuting area by gender

Preference rank	Men (%)	Women (%)
Choice 1	33.2	34.0
Choice 2	29.9	30.8
Choice 3	27.9	29.0
Choice 4	29.3	30.8
Choice 5	29.7	31.0
Choice 6	34.9	37.4
Choice 7	33.9	35.8
Choice 8	33.7	34.9
Choice 9	34.6	36.2

Notes: Values are percentages. The commuting area includes the school municipality and commuting-connected municipalities under the 2015 1% criterion.



Appendix Figure 2. Gender gap in university application selectivity after accounting for summer application preferences, excluding cases with an absolute gap greater than 3 SD between the most selective program applied to and the first-choice school in the summer mock examination