Gender Dynamics in Entry into Competitive Careers: Evidence from Indian Civil Services*

Kunal Mangal
Niharika Singh

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Abstract

We examine gender dynamics in entry into the Indian civil services, where depends on one of the most highly competitive exams in the world. Using unique administrative data covering the universe of applicants to civil service jobs in Tamil Nadu from 2012–19, we track a cohort of first-time applicants over multiple exam cycles to track gender gaps in participation and performance. Women constitute a majority of first-time applicants and outperform men on average, but men are more likely to become top-scorers. Since success is rare in the first attempt, we examine reapplication behavior and performance over a five-year horizon. Women are more likely to reapply at least once, but less likely to persist through consecutive exam cycles. Conditional on reapplying, women perform as well as or better than men on average, though their probability of becoming top-scorers varies across attempts, reflecting a combination of selection, score improvements, and luck. To understand these patterns, we supplement administrative data with candidate surveys and an information experiment. We show that marriage market pressures and limited household support reduce women's ability to sustain effort and repeated attempts. These findings show how gender gaps can arise in access to elite careers—even in standardized, meritocratic systems designed to ensure fairness.

*Mangal: Independent Researcher, kmangal@alumni.harvard.edu; Singh: University of Notre Dame, nsingh6@nd.edu. We thank Emily Breza, Taryn Dinkelman, Rachel Heath, Asim Khwaja, Suresh Naidu, Rohini Pande, Barbara Petrongolo, Heather Sarsons, Simone Schaner, Mahvish Shaukat, and Basit Zafar for helpful comments. This work would not have been possible without the support of K. Nanthakumar, R. Sudhan, and S. Nagarajan of the Tamil Nadu Government and the patience of the R&D Section of the Tamil Nadu Public Service Commission. We thank Manchit Jasrotia and S. Manohar for exceptional research assistance. The information experiment was approved by IRBs at Azim Premji University and Columbia University and is registered in the AEA RCT Registry (AEARCTR-0009487). We are grateful for funding support from INCITE @ Columbia University and the Weiss Fund for Research in Development Economics. All errors are our own.

Women around the world remain underrepresented in high-wage, elite occupations, where entry often requires sustained investment and a willingness to compete (Bertrand, 2018; Goldin, 2021). Persistent gender gaps in the labor market are typically attributed either to unequal constraints and opportunities or to intrinsic differences between men and women, with distinct implications for policies aimed at improving talent allocation (Olivetti et al., 2024; Heath et al., 2024). Yet identifying the sources of these gaps in elite occupations remains challenging: recruitment processes are often opaque and decentralized, making it difficult to observe the pipeline into such careers, and supply-side choices are also hard to disentangle from demand-side factors that shape gendered participation and performance.

We examine how men and women compete for administrative civil service jobs—among the most sought-after careers in the Indian labor market. Hiring for these positions occurs through centralized, merit-based examinations, offering a rare opportunity to observe the entry pipeline into elite jobs and to study gendered behavior in a setting with limited employer discretion. Improving women's representation in these jobs is widely recognized as an important policy objective, given the bureaucracy's role in governance and public service delivery. In the Indian central bureaucracy, where data are readily available, women's representation has increased over time, but as of 2022, women still accounted for only 30% of successful entrants (UPSC, 2024). This under-representation is particularly striking given women's rising academic achievement and the fact that competitive exams largely test material covered in high school and college curricula.[1] The entry margin is also especially important in this context: since voluntary exits are rare, the gender composition of the bureaucracy is largely determined at the point of entry.

To shed light on how gender disparities arise in the competition for elite public sector jobs, we combine unique administrative data from state-level civil service recruitments in Tamil Nadu with an original survey and information experiment among applicants. Our analysis proceeds in two parts. First, we access anonymized data on applications, test scores, and placements over an eight-year period and adopt a pipeline approach to analyzing gender differences in participation and performance in these high-stakes entry examinations. These data allow us to trace who selects into competition, how they perform, who persists over time, and, ultimately, who secures a civil service job. Our main finding is that although women are highly motivated to apply and outperform men on average in their first attempt, they are less likely to persist in exam-taking over time and are underrepresented among top scorers. Second, we explore mechanisms underlying these patterns, drawing on administrative, survey, and experimental data. While multiple factors are likely at play, we present evidence that differential marriage market pressures and household support meaningfully limit women's persistence in exam-taking and their likelihood of becoming top scorers.

Successful entry into the Indian civil services is highly competitive, with vacancy-to-applicant ratios often reaching several hundred or even thousands to one. As a result, many candidates invest years preparing for and taking and re-taking exams in hopes of securing one of these coveted positions—despite the potential for significant long-run costs (Mangal, 2024). In our data, just 7% of successful candidates passed the exam on their first attempt, while nearly 60%

[1] Women consistently outperform men in standardized school-leaving exams, and they are well represented among top scorers. For example, 64% of the highest scorers in standardized Class 10 exams were female (Central Board of Secondary Education, 2019). Women also have similar enrollment and graduation rates in college (AISHE, 2022).

succeeded only after four or more years. Understanding barriers to success, therefore, requires tracking candidates over time.

We use administrative data on all recruitments between 2012-19 conducted by the Tamil Nadu Public Service Commission (TNPSC) for general administrative civil service positions, collectively referred to as "Group exams."[2] We construct a cohort of first-time applicants by matching candidates across exams using an anonymized proxy identifier based on individuals' names, parents' names, and dates of birth. We define first-time applicants as those who appeared for a Group exam in 2014, but not in the two preceding years. Our preferred sample restricts attention to college graduates under the age of 30.

Tracking this cohort over time, we report three main findings. First, women comprise nearly 60% of first-time applicants and outperform men on average in their first exam attempt, but are underrepresented among top-scorers. The high share of female applicants suggests that women are willing to enter into high-stakes, competitive contests. In terms of baseline exam performance—measured as the percentile rank in the first exam—women score 2.4 points higher than men, even after controlling for observable characteristics.[3] This indicates that the pool includes many high-performing female candidates. Nevertheless, women are less likely to be in the top 1% of scorers or to qualify as a "top-scorer."[4] Success, however, is rare on the first attempt, in part because first-time applicants compete with repeat applicants from earlier cohorts who are increasingly positively selected.

Second, among unsuccessful candidates from the first year, women are *more* likely than men to reapply at least once over the five-year follow-up period, but *less* likely to reapply consistently across all five years. We examine two distinct measures of reapplication behavior, controlling for baseline exam performance. First, we measure whether individuals reapply in at least x out of five years, which allows for interruptions between attempts. Women are 2.9 percentage points (p.p.) more likely to reapply at least once, relative to 46.7% of men. However, this advantage disappears with additional attempts: women are 1 p.p. less likely to reapply in at least four out of five years, compared to 10.4% of men. Next, we assess whether individuals reapply in each of the five years following their first attempt, a stricter definition that captures sustained effort without interruptions. Women are 14–25% less likely than men to reapply continuously for five years. These patterns remain similar when we restrict to the top-quartile of baseline scorers—i.e. those most likely to succeed—and control for their observable characteristics.

Third, conditional on reapplication, women perform as well as or better than men on average across exam attempts, but their likelihood of becoming top-scorers varies across attempts. Using five years of follow-up data on exam-taking after the first attempt in 2014, we estimate gender differences in both maximum percentile rank and top-scorer status across each year of attempt, conditional on baseline exam performance and the sequence of exams taken. Women exhibit higher average percentile ranks than men across all subsequent attempts, but these gains do not consistently translate into higher rates of becoming top-scorers. Women are significantly

[2]Each recruitment pools vacancies across departments by educational qualification and pay grade; candidates apply to the exam rather than to specific posts.

[3]We control for: age, caste, marital status, type of undergraduate degree, whether they completed their high school and undergraduate education in Tamil, and birth district fixed effects.

[4]A top-scorer is an individual achieving a rank higher or equal to the number of vacancies in the recruitment.

more likely to become top-scorers in the second year of attempts. As women are more likely to reapply at least once, this early advantage likely reflects a combination of positive selection and learning. However, in subsequent years of attempts, women's likelihood of reaching the top declines relative to men, even as their average ranks are better. This pattern holds even among applicants who were in the top-quartile of baseline scorers. In fact, we find that among the top decile of baseline scorers, the median within-person deviation in percentile rank is about 3 points, suggesting that luck may in general be an important factor determining success at the very top. Alongside luck, the growing gender gap in top-scorers may reflect declining positive selection—as gender gaps in reapplication emerge in later years—or differences in sustained effort over time.

Ultimately, while women make up 60% of first-time applicants, they account for only 40% of top-scorers by the end of the six-year follow-up period. Notably, three-fourths of the gender gap in top-scorers emerges after the first year, highlighting the importance of understanding reapplication and investment behavior over time in shaping access to elite public sector careers.

While several factors could plausibly explain the gender gaps documented in our pipeline analysis, we provide descriptive, observational, and experimental evidence pointing to the central role of marriage market timing and household support. Three groups dominate the applicant pool: single men, single women, and married women.[5] Based on our fieldwork and the existing literature, we provide a conceptual discussion that illustrates how, despite the appeal of civil service jobs for all three groups, they face different decision-making environments and tradeoffs in pursuing these jobs. For women, these constraints vary by marital status: single women often experience early marriage pressure limiting their time horizons for exam attempts, while married women—though positively selected—receive limited support for sustained exam preparation. In contrast, single men benefit from longer windows to pursue exams as they can marry later and from greater household support, making it easier to persist through repeated attempts. That is, prevailing gender norms regarding work and household obligations have opposite effects by gender: encouraging persistence among men while discouraging it among women.

To quantitatively assess the role of marriage and household constraints—as well as alternative explanations—we supplement the administrative data with an original survey of candidates actively preparing for exams. The survey collects information on personal and family background, exam preparation, and marriage and labor market expectations. While we cannot directly link administrative and survey records, we collect self-reported 10th-grade standardized exam scores and use them as a proxy for ability in our survey-based analyses.

Survey responses reveal stark gender differences in marriage market exposure and household support. Women receive marriage proposals at significantly younger ages than men (21 vs. 24 years), consistent with differences in marriage rates by age in representative data. Among single respondents, high-scoring women (based on 10th-grade exam scores) are more likely to have received a proposal than both low-scoring women and similarly high-scoring men, even after controlling for age. Single women also report greater disagreement with parents over ideal marriage timing. Turning to direct measures of exam support, single men receive 30–50% more monetary assistance from family and social networks than both groups of women, with especially

[5]Married men make up less than 5% of applicants and are excluded from this part of the analysis.

large gaps for married women—even among high scorers. This difference is notable because men are more likely to have independent income or savings and thus require less external support to finance exam preparation.

Motivated by these descriptive patterns, we examine heterogeneity in reapplication behavior by *baseline* marital status among first-time applicants from the administrative data. We document two key patterns consistent with women internalizing marriage or household constraints and strategically adjusting their efforts. First, conditional on baseline exam performance and other characteristics, both single and married women are more likely than single men to reapply at least once. However, married women are significantly less likely to reapply to multi-stage exams, which require greater time and preparation. Instead, they are more likely to target single-stage exams that demand lower investments. In contrast, single women are just as likely as single men to reapply at least once to multi-stage exams. Second, single women begin taking exams at younger ages than single men, consistent with anticipating a shorter time window for pursuing a civil service career. Despite these strategic adjustments however, both married and single women are still less likely to reapply continuously for five years compared to single men.

Finally, we complement the descriptive and observational evidence with results from an experiment embedded within the candidate survey. A random subset of respondents received information about the distribution of total attempts made by successful candidates in a recent Group exam. At least two-thirds of respondents underestimate the share of successful candidates who had made three or more attempts. This approach allows us to assess how responsiveness to the *same* signal varies across single men, single women, and married women. We find that single women significantly reduce their desired number of attempts in response to the treatment, whereas there is no significant change for single men or married women.

In the experiment, we also cross-randomized a prime to increase the salience of household obligations in married life.[6] Among married women, the combination of the prime and the information reduces the number of desired attempts, suggesting greater sensitivity to household constraints. In contrast, the marginal effect of the prime is positive for single women, indicating that reminders of post-marriage obligations attenuate the negative effect of the information.

We also consider a range of alternative explanations for the gender gaps we observe, including differences in behavioral traits, private labor market options, access to networks and information, and top-end STEM ability. While we cannot conclusively rule out all of these mechanisms, our evidence suggests they are unlikely to be the *primary* drivers in this setting. Where gender differences do exist, they tend to be modest and typically arise for either single or married women, but not both. In contrast, marriage and household constraints emerge as consistently salient for both groups of women across descriptive, observational, and experimental analyses.

This paper contributes to an extensive literature on gender inequality in job search and hiring.[7] Existing research has emphasized both supply-side and demand-side factors in explaining sorting into occupations and jobs.[8] However, many of these studies cannot observe the full re-

[6]The prime was delivered prior to the information treatments for respondents assigned to both treatments.

[7]See Olivetti et al. (2024) and Heath et al. (2024) for reviews of evidence from high-income and low-income countries, respectively.

[8]On the supply side, researchers have studied commuting preferences (e.g., Le Barbanchon et al., 2021), the language and framing of job postings (e.g., Abraham et al., 2024), and concerns about safety (e.g., Folke and Rickne,

cruitment pipeline for a single profession. We address this gap by tracing gender differences in participation, performance, and success into one of India's most sought-after careers. In doing so, we document how gender gaps can persist—even in a context with high female representation among applicants and limited employer discretion due to merit-based recruitment.

Relatedly, our work sheds light on how marriage markets influence women's labor market choices in lower-income countries. In a context marked by large gender gaps in employment and conservative gender norms, marriage-related pressures may shape how women navigate career opportunities. Prior work has shown that marriage markets affect women's educational investments (e.g., Ashraf et al., 2020; Andrew and Adams, 2022), and that women in India face marriage market penalties for working outside the home (Dhar, 2021; Afridi et al., 2023). We extend this literature by documenting how marriage pressures influence the occupational choices of young women.[9]

Second, we contribute to the literature on gender differences in competitive behavior and reactions to failure. Prior evidence typically comes from lab experiments (e.g., Niederle and Vesterlund, 2007), sports tournaments (e.g., Buser and Yuan, 2019), educational settings (e.g., Cai et al., 2019; Kang et al., 2024), and politics (Wasserman, 2023). This evidence often suggests that women are less willing to enter tournaments and respond more negatively to failure than men, lowering their persistence in competitive environments. We provide new evidence from a high-stakes labor market context, showing that women are willing to enter—and even re-enter—a highly competitive tournament. However, women are less likely to sustain participation over several years, a dynamic that proves critical to eventual success in this setting.

Third, our work contributes to literature on the personnel economics of the state. Prior studies have focused on how monetary and non-monetary incentives or screening practices shape the composition and quality of public sector workers (Finan et al., 2017). A defining feature of the labor market in lower-income countries is the intense competition for public sector jobs, which are widely viewed as stable, prestigious, and socially acceptable, especially for women. We show that in the presence of gendered norms, this prolonged and highly competitive selection process can disadvantage even highly qualified and motivated women, ultimately shaping the gender composition of hires. These findings highlight how sustained competition can dampen the meritocratic promise of exam-based recruitment. Our results complement the findings of Moreira and Pérez (2022), who document the representation tradeoffs associated with a move towards meritocratic hiring. To the extent that diversity improves public service delivery (Rasul and Rogger, 2015; Xu, 2020), or is valued as a policy goal, our results suggest that gender quotas may be necessary to ensure women's equal representation in bureaucracies, particularly in settings with conservative norms and intense job competition.

The rest of the paper proceeds as follows. Section 1 provides details on civil service recruitment in Tamil Nadu and the data that we use to study it. Section 2 follows applicants through the recruitment pipeline and establishes key facts regarding gender differences in participation and performance. Section 3 presents evidence on the drivers of gender differences in our context

2022). On the demand side, recent work highlights the prevalence of explicit gender preferences in job postings (Gentile et al., 2023; Kuhn et al., 2020) and the use of discretionary screening practices (Mocanu, 2022).

[9]Our findings echo evidence from the U.S. that single women adjust behavior in response to marriage market incentives (e.g., Bursztyn et al., 2017).

using surveys and an information experiment. Section 4 discusses the implications of our results and concludes.

1 Context and Data

1.1 Civil service recruitment in Tamil Nadu

The Tamil Nadu Public Service Commission (TNPSC) conducts direct recruitment for state-level civil service positions in the state of Tamil Nadu.[10] As elsewhere in India, this recruitment occurs through competitive exams. The TNPSC conducts exams for administrative civil service posts by combining groups of vacancies across government departments that have similar rank and educational requirements. These exams are collectively referred to as "Group exams" and are the focus of this paper. Group exams are extremely popular, inviting hundreds to thousands of applicants per vacancy.[11] We now describe the types of jobs covered by the Group exams, their eligibility criteria, and the accompanying recruitment process in greater detail below (see Appendix A.1 for a summary).

1.1.1 Type and eligibility of jobs

Civil services jobs in Tamil Nadu fall into four broad categories: Group 1, Group 2, Group 2A, and Group 4. Group 1 posts correspond to the highest ranking posts in the state bureaucracy, followed by Group 2, Group 2A, and then Group 4. For example, job titles for Group 1 posts include Deputy Collector or Assistant Commissioner, and for Group 4 include Junior Assistant or Village Administrative Officer (see Appendix A.1 for more examples).

Each group exam has eligibility criteria based on educational qualifications and age.[12] A college degree is required to participate in Group 1, 2 and 2A exams, while Group 4 exams require only secondary school (10th grade) completion. Some posts may additionally require specific qualifications, such as a Typewriting certificate. The minimum age is typically 21 years for college-level posts and 18 years for secondary-level posts. Maximum age limits vary by post, caste, and reservation category, but are consistently higher for reserved groups, ranging from 35 years to no upper limit.[13] There are no formal restrictions on the number of attempts over time.

1.1.2 Recruitment process

The recruitment process for Group exams has four distinct stages. **Stage I** begins with a public notification for an upcoming Group exam. This notification serves as the official document and

[10] The TNPSC is the oldest state-level Public Service Commission in India, established in 1929 as the Madras Public Service Commission.

[11] The TNPSC also handles recruiting for specialized and technical positions in the state government. In contrast to Group exams, these positions constitute a minority of vacancies and face much less competition.

[12] While TNPSC jobs are officially open to all Indian citizens, the inclusion of Tamil-language questions results in a very low share of applicants from other states (less than 0.1%).

[13] Over the sample period, the share of applicants from non-reserved categories is approximately 2%. As a result, the vast majority of applicants in our data face a 15–20 year eligibility window.

contains information on the exam type, number of vacancies, the eligibility criteria, and the tentative exam date.

Stage II involves a registration period of approximately one month, during which candidates must complete an online application form. The information provided in this form is considered official; discrepancies between the form and supporting documents can jeopardize a candidate's eligibility for eventual employment. TNPSC also uses this information to verify exam eligibility based on the criteria outlined above.

Stage III involves the administration of competitive exams. All registrants deemed eligible may choose to appear for the exam.[14] The exam structure varies by Group category. Group 1 and Group 2 recruitments follow a multi-stage selection process, whereas Group 2A and Group 4 involve single-stage selection. The first stage—or the only stage in single-stage recruitments—consists of multiple-choice questions. Group 1 and 2 recruitments additionally include a written essay exam and an interview stage. Progression to each subsequent stage is limited to the highest-performing candidates from the previous round.[15]

Candidates are evaluated primarily on their exam performance. In single-stage exams, final rankings are determined by scores on the multiple-choice exam. In multi-stage exams (Group 1 and 2), only performance in the final two rounds—the essay exam and the interview—contributes to the final ranking. The scoring is weighted heavily towards the essay exam, with the interview accounting for about 12% of the final score.

Stage IV is the final step in the recruitment process: job placement. After the final ranks are determined, TNPSC allocates candidates to vacancies through an in-person "counselling" process held in Chennai. Candidates are invited in rank order to choose from the pool of available vacancies, subject to their reservation category and qualifications. To ensure compliance with reservation policies and job eligibility criteria, TNPSC typically invites top-ranking candidates at a ratio of 2–3 times the number of available vacancies. The full recruitment process—from stage I to IV—can take up to a year for single-stage recruitments and about two years for multi-stage recruitments. Given these timelines, single-stage recruitments demand lower time investments and commitment compared to multi-stage recruitments.

1.1.3 Reservation policy

Tamil Nadu has an extensive reservation policy that covers specific caste categories, women, persons who studied in Tamil, destitute widows, persons with benchmark disabilities, transgender persons, and ex-service personnel. Established in 1989, the official quota for women is 30% and applies to all Group exams. This quota sets a floor for representation as women are also eligible to compete for seats in the unreserved "general" category. Vacancies are allocated to reservation categories before applications are received and are either included in the initial notification for

[14] TNPSC typically establishes several hundred exam centers across the state, depending on the number of registered candidates. Each district will generally have multiple centers distributed across urban and rural areas.

[15] TNPSC uses a fixed ratio to determine the number of candidates advancing to subsequent stages. The number of candidates invited to the essay stage is 10–20 times the number of vacancies, depending on the Group exam. For the interview stage, the ratio of candidates invited is 2–3 times the number of vacancies, depending on the number of posts available by reservation status.

the exam or published shortly thereafter.

1.2 Administrative data on civil service recruitment

We observe anonymized administrative data from the TNPSC that spans the recruitment process for all Group exams announced and conducted between 2012 to 2019. We describe these data below. A summary of data coverage over the years is available in Appendix A.2.

Registration: These data include registration information filled by candidates. We observe variables such as date of birth, gender, education, reservation status, and marital status.

Exam scores: These data record test scores at each stage of the recruitment process. This data is available for Group exams conducted between 2012 to 2019.[16] We use these data to construct who actually appeared for the exams, referring to these individuals as "applicants." For comparability across exams, we compute exam-level performance as a percentile rank, which varies from 100 (for the highest-scoring candidate) to 0 (for the lowest-scoring candidate).[17]

Placement: These data record the final placement/hiring outcomes for Group exams between 2013 to 2019. We can observe the specific posts that applicants obtained and under which quota (if any).

Matching across datasets and exams: The anonymized data includes unique identifiers that allow us to match individuals (i) across the above mentioned datasets for each exam and (ii) across different exams over time. For a given exam, a unique identifier links registration data to exam scores to placement.[18] Since TNPSC does not officially track attempts over time, we use another unique identifier constructed using applicant details provided at registration to match across exams. This identifier is based on a combination of candidate's name, their parents' name, and their date of birth.[19]

In addition to these administrative data, we also use publicly available information regarding vacancies and eligibility criteria for the Group exams from 2012 to 2019. These data are compiled and coded from official notifications released by the TNPSC.

1.3 Key facts about civil service recruitment

Using the data discussed above, we highlight several facts about the context that guide our empirical analysis.

[16] There are two exceptions: (i) We do not observe test scores from the 2012 Group 1 exam, and (ii) we do not observe scores from the first stage of the 2016 Group 1 exam, though we do observe who appeared for the exam.

[17] For multi-stage exams, we construct the percentile rank in two steps. First, we assign those who do not qualify past the first stage to have a score of zero for the subsequent rounds. Second, since the first stage score does not matter for those who qualify for subsequent rounds (see section 1.1.2), we compute their total score by summing across the essay and the interview stages and adding a fixed value to account for their qualification past the first stage. These steps allow us to generate a final score for all applicants, which we then use to construct percentile ranks. We assign ties in final score to have the same percentile rank.

[18] We are unable to match 117 observations (out of over 13.6 million) and drop these from our analysis.

[19] Naming conventions in Tamil Nadu use initials that may differentially change for women upon marriage. The unique identifier we use avoids this concern by only using first names for candidates and their parents (father and mother). For applicants in a given exam, duplicates based on this identifier are extremely rare (less than 0.01% of the registrations). We drop all observations for those individuals tagged as duplicates in any given exam (322 out of over 13.6 million observations).

Fact 1. There is severe competition for civil service jobs.

Table 1 summarizes the level of competition and placement outcomes in Group recruitments conducted between 2013 and 2019. Across all exams, there are on average 540 applicants per vacancy. The overall placement rate—defined as the share of applicants who ultimately secure a job—is just 0.33%. Disaggregating by exam category, Group 1 is the most competitive, with a placement rate of only 0.09%, followed by Group 2 at 0.25%. Group 2A and Group 4 exams are slightly less competitive, with placement rates of 0.47% and 0.45%, respectively. Notably, in every exam category, the placement rate remains below 1%, underscoring the extreme competitiveness of these civil service exams.

Fact 2. Success requires multiple attempts over time.

Using data on 9,865 candidates who succeeded in the 2019 Group exams, we calculate the number of years in which these individuals attempted any Group exam.[20] Figure 1 plots the resulting distribution. Only 7% of successful candidates succeeded in their first year—i.e., in 2019—while the remaining 93% had attempted a Group exam in at least one previous year. Notably, 42% had attempted exams in a total of five or more years, including 2019.

In addition, most successful candidates from 2019 exhibit continuity in attempts. We compute the maximum break (in years) in exam participation for each successful candidate over the 2012–19 period and plot the distribution in Figure 2. Nearly 63% took no breaks at all, and another 30% had at most a one-year gap. This pattern of persistent—and often uninterrupted—reapplication underscores the central role of sustained, continuous investment in exam preparation in achieving success.

Fact 3. Successful candidates are college educated and perform well in their first attempt.

We compare successful applicants to the overall applicant pool in 2019 across key demographic, participation, and performance characteristics (see Appendix C.1). Consistent with reapplication patterns discussed above, successful candidates tend to be older (27.5 vs. 26.0 years) and have a longer history of exam-taking (3.2 vs. 1.7 years on average). Most make their first attempt early: the average age at first attempt is 23.7 years, and nearly 90% of individuals take their first exam before age 30. Notably, women make up a majority (56%) of the overall applicant pool.

Turning to education, 89.4% of successful candidates in 2019 held a college degree, compared to just 56.5% of all applicants.[21] This is striking given that nearly 80% of vacancies come from Group 4 recruitments, which only require passing the 10th-grade exam.

We also examine performance on individuals' earliest exam attempt visible in our data. While the average baseline percentile rank is 45.8 among all applicants, it rises to 74.3 among successful candidates. As shown in Figure 3, over 75% of successful candidates scored within the top 40% in their first attempt. This indicates that initial performance is strongly predictive of

[20] We focus on the 2019 cohort to maximize the window for observing prior exam-taking behavior.
[21] This pattern holds across years: between 2013 and 2019, 88% of successful candidates had a college degree.

eventual success and reflects dynamic selection into repeated attempts based on early outcomes, which we explore further in section 2.5. Still, a sizable share of successful candidates come from outside the top 5% of baseline scorers. This underscores the potential for improvement over time and the value of tracking a broader set of high-potential applicants, rather than focusing solely on top initial performers.

Together, these patterns reveal significant heterogeneity in success rates across applicants. Since selection into success depends on both strong initial performance and sustained participation, these results underscore the importance of following the trajectories of college-educated and high-performing first-time applicants over time.

1.4 How successful are women in entering the civil services?

Table 1 presents two measures of women's success in the TNPSC Group exams from 2013 to 2019. The first is the female share of hires across all Group recruitments during this period. The second is the female share of top-scorers, defined as candidates who secured a rank equal to or higher than the number of notified vacancies in a given exam. Given the 30% gender quota in Tamil Nadu, the second measure focuses exclusively on performance, offering a cleaner proxy for merit-based selection.[22] Comparing the female share of hires to that of top-scorers provides a way to estimate the extent to which the gender quota contributes to women's representation, holding constant the selection of participants.

Women constitute 49% of all hires, but only 39% of top-scorers—suggesting that near gender parity in overall hiring masks a performance gap. Disaggregating by exam category, women outperform men in Group 1 exams and perform comparably in Group 2 exams, but lag behind in Groups 2A and 4. However, Groups 2A and 4 account for 92% of all vacancies during this period, which helps explain the lower overall female share among top-scorers. This is a striking pattern: Women are more likely to succeed in securing the most prestigious roles in the state bureaucracy but face greater challenges in obtaining the more numerous, though still highly competitive, jobs without quotas. To understand why women's overall performance lags that of men, we next examine dynamics along the recruitment pipeline.

2 Gender Dynamics in the Recruitment Process

In this section, we construct and follow a cohort of first-time applicants to understand how men and women behave differently throughout the civil service recruitment process. Along the pipeline, we consider initial selection, baseline performance, reapplication behavior, performance gains over time, and, ultimately, job placement.

[22] For the remainder of the paper, we use this top-scorer measure as a proxy for placement, as it abstracts away from administrative selection mechanisms such as reservation policies.

2.1 Sample construction

Using the administrative data described in section 1.2, we construct an applicant-level dataset that tracks annual participation and performance in Group exams. We consider an applicant to have participated in a given year if they appeared in *any* Group exam conducted by the TNPSC during that year.[23] Across 2012-19, the TNPSC held 2-4 separate Group recruitments each year.

Definition of first-time applicant: Using the anonymized identifier from the administrative data, we classify an individual as a first-time applicant if they appear for a Group exam in a given year but did not appear in any Group exams in the previous two years. The key trade-off in using longer look-back periods to define first-time applicant status is that we are restricted to considering shorter windows of future participation.

Preferred sample: We use the above definition to construct a cohort of first-time applicants in 2014—that is, individuals who appeared for a Group exam in 2014 but had not taken any Group exam in 2012 or 2013. This yields an initial sample of 836,144 individuals, whose exam participation and performance we track over a six-year period.

We apply three restrictions to the initial sample to define our core analytical sample. First, we exclude applicants already employed in a government job as reported in the registration data, (1% of the initial sample). These individuals are likely seeking better positions within the bureaucracy and their behavior may differ from those attempting to enter for the first time. Second, we exclude individuals without a college degree, since successful placement is dominated by college graduates (see Fact 3 in section 1.3). Finally, we exclude applicants aged 30 or older.[24] After applying these restrictions, our main analytical sample includes 272,432 individuals.[25]

2.2 Summary statistics

We begin by examining gender differences in observed characteristics among first-time applicants. Notably, women constitute a *majority* (59%) of these applicants. Given the widely recognized competitive of Group exams, this high rate of initial participation suggests that women are, on average, interested in pursuing these careers and are not avoiding competition at the outset.

Table 2 summarizes gender differences across a range of demographic and educational variables. The average age of male and female applicants is similar, about 24 years old, though women are slightly younger by 0.3 years. While the majority of applicants are unmarried, women are substantially more likely to be married than men (37.6% vs 9.2%).[26] Since marriage (and children) may limit women's ability to invest in exam preparation—due to gendered

[23] In multiple stage exams (Group 1 and 2), this refers to appearing for the prelim/first stage exam. Subsequent stages are not considered in this definition.

[24] Among college-educated first-time applicants, 77% are under the age of 30. Mangal (2024) also shows that participation among college graduates, relative to their population share, peaks in this age range. We therefor use this age cutoff to enable more meaningful—less selected—comparisons across demographic subgroups.

[25] We present and discuss robustness of the results to alternate sample restrictions and first-time applicant definitions in section 2.7.

[26] Women tend to marry earlier than men of similar ages across India, with a median age gap at marriage of about 4 years (IIPS, 2021).

norms around care responsibilities and household obligations—this represents a potential constraint on women's success.[27] In terms of location, most applicants are born outside Chennai district, where the largest city in the state is located, and men and women are equally likely to be born in Chennai.

We also observe applicants' educational background in terms of the linguistic medium of instruction and the type of undergraduate degree. Women are 2.8-4.4 p.p. more likely to have completed their high school and undergraduate education in Tamil. Within Tamil Nadu, educational instruction in Tamil is generally viewed as a marker of disadvantage in the labor market.[28] The higher prevalence of Tamil-medium education among women may reflect differences in household wealth, parental investment in education, or other constraints correlated with lower resources or opportunities for exam preparation.

With respect to undergraduate degrees, we find no consistent gender differences in the relative prestige of degree programs. In India, degree choice is largely determined by performance on school-leaving exams: Students with higher scores typically enter more technical programs such as B.Sc. or B.Engineering, while those with lower scores tend to enroll in B.A. programs. Although women are less likely than men to hold engineering degrees, they are more likely to hold degrees in science. On balance, both male and female applicants span a wide range of academic backgrounds, suggesting that gender differences in applicant quality at this initial stage are not systematically large.

2.3 Empirical approach

For the pipeline analysis, we estimate the following regression specification to capture average differences by gender:

$$Y_i = \beta Female_i + \delta_e + \epsilon_i \tag{1}$$

where Y_i denotes the outcome of interest for applicant i, and $Female$ is a binary variable equal to one if the applicant is female. δ_e represents fixed effects for the Group exam category of the applicant's first exam, which we refer to as their "baseline" exam throughout the analysis.

To examine gender differences conditional on exam performance, we extend this specification by including the applicant's baseline percentile rank:

$$Y_i = \beta Female_i + rank_i + \delta_e + \epsilon_i \tag{2}$$

where $rank_i$ is the percentile rank achieved by applicant i in their baseline exam. This modification allows us to compare men and women with similar initial performance. We also present results after controlling for additional baseline characteristics observed in the administrative data, including caste, marital status, age, type of undergraduate degree, medium of educational instruction in both high school and college, and birth district fixed effects.

[27] While we do not observe the presence of children in the administrative data, marriage and childbirth are closely linked in India, with the median married women having a first child within about 2 years of marriage (Nagdeve and Pradhan, 2023). Candidate surveys discusssed in section 3.2 also show that 72% of married women interested in applying for TNPSC jobs have children.

[28] Reflecting this disadvantage, the TNPSC has a quota for candidates who studied in Tamil.

2.4 Baseline exam performance

We document how men and women perform in their baseline exam attempt in Table 3. Women obtain an average percentile rank that is 2.4 points higher than men (column 1), and this advantage persists after after controlling for baseline covariates (column 2).

Next, given an average placement rate of 0.33%, we examine gender gaps at the top of the distribution using two measures: (i) being in the top 1% of scorers (columns 3–4), and (ii) being a "top-scorer"—our placement proxy, defined as achieving a rank equal to or better than the number of available vacancies (columns 5–6). Across both measures, women are significantly less likely than men to reach the top. To pinpoint where the reversal occurs, Figure 4 plots the full distribution of baseline exam performance separately by sex. The decline in women's relative performance emerges near the top of the distribution, around the 95th percentile.

While women are less likely than men to reach the top of the score distribution in their first attempt, recall that successful entry into the civil services usually requires multiple attempts (see Figure 1). We therefore next examine patterns of re-application.

2.5 Reapplication behavior

Since first-time applicants take their initial exam in 2014, our data allow us to assess reapplication behavior over a five-year period from 2015 to 2019. Before examining gender differences, Appendix C.3 plots non-parametric estimates of the fraction of first-time applicants that reapplied to exams conducted in 2015, restricting the sample to those who were unsuccessful in 2014. Reapplication rates increase with applicants' baseline percentile rank—and rise particularly sharply in the top quartile—suggesting that candidates learn about potential future success from their initial exam performance. This pattern of dynamic selection also highlights why first-time applicants may find it especially difficult to succeed: they are competing against positively selected applicants from previous cohorts with greater familiarity with the exam process.

With this context in mind, we now examine gender differences in the propensity to reapply, again restricting the sample to those who were unsuccessful in 2014. We consider two definitions of reapplication over the five-year follow-up period: (i) whether an applicant reapplies in at least x out of five years, and (ii) whether they reapply continuously—that is, in every year—following their initial attempt. The first measure allows for interruptions in reapplication, while the second captures sustained engagement with the exam process. Table 4 reports these results.

Strikingly, women are *more* likely to reapply at least once in five years (Panel A, column 1). This pattern holds among the top-quartile of scorers, both with and without baseline controls: while 55.3% of male applicants reapply at once, the corresponding rate for female applicants is 57.3–58.7% (Panel B and C). Figure 5, panel (a), confirms that the consistency of this pattern across the baseline score distribution, highlighting strong interest from women in pursuing civil service jobs. However, this advantage reverses when we consider more persistent forms of reapplication. Women are *less* likely to have reapplied in at least four out of five years (column 2). This pattern is even more pronounced when examining continuous reapplication: among top-quartile scorers, women are significantly less likely—by 1.3 p.p. 14.4% relative to men—to reapply every year for

five years (column 4, Panel C). Figure 5, panel (b), shows this pattern across the baseline score distribution.

Given that successful candidates tend to reapplying continuously with limited interruptions (see Figure 2), these results suggest that while women are *more* willing to re-enter competition in general, they are less able or willing to persist in doing so over longer time horizons. Notably, these gaps are larger among top-quartile scorers, where the probability of success and eventual placement is highest (see section 1.3).

2.6 Exam performance across attempts

We now examine how gender differences in exam performance vary over time, conditional on reapplication. We estimate a regression of the following form:

$$y_{ia} = \sum_{a=2}^{6} \left[\beta_a female_i \times 1(attempt_i = a) + \gamma_a 1(attempt_i = a) \right] + \alpha_g + rank_i + \epsilon_{ia} \tag{3}$$

y_{ia} denotes our outcome of interest in the a-th year of attempts by applicant i. For each year of attempt, we compute either the maximum percentile rank achieved across all exams taken in that year or whether the applicant became a top-scorer in any exam. Under this construction, if a first-time candidate from 2014 next applied in 2016, the attempt in 2016 would be counted as their second year of attempt. We observe at most five years of reapplication attempts—from 2015 to 2019—for our sample of first-time applicants. The β_a coefficients capture how women's performance in a given attempt-year compares to that of men. α_g denotes fixed effects for the sequence g of Group exams candidates applied for from 2014 to 2019, controlling for the path of exam-taking behavior by applicants. We again control for $rank_i$, which is applicants' baseline percentile rank. Standard errors are clustered by applicant to account for serially correlated errors in exam performance.

Table 5 shows these results for all individuals in our first-time applicant sample as well as the top quartile of baseline scorers. For the full sample, across the five year follow-up period, women obtain higher percentile ranks on average than men (column 1–2). Restricting the sample to those who were in the top quartile of scorers in their first exam, the pattern remains similar (columns 3–4).

While women perform better on average than men upon reapplication, the likelihood of becoming a top-scorer—our proxy for placement in the absence of quotas—varies across attempts (columns 5–8). In the second year of attempts, women are *more* likely to be top-scorers. As women are more likely to reapply once across the baseline score distribution (see 5, panel a), this result suggests that women are either positively selected or show learning gains. Over subsequent years however, this advantage reverses and women are less likely to become top-scorers. Part of this pattern is likely explained by women's declining positive selection over time, given the reapplication patterns documented above. If there are gains (however small) to continuously preparing for exam without breaks, then this could also explain why women fail to become top-scorers even as they perform better than men on average. A third consideration may be luck: among applicants in the top decile of baseline scorers, the median within-person

standard deviation in percentile rank across attempts is approximately 3 points. This suggests that at the very top, performance is not very stable, consistent with evidence that these exams may not be designed to meaningfully discriminate among the top candidates (Mangal, 2023).

2.7 Robustness to alternative samples

We now consider the sensitivity of the pipeline results—focusing on initial performance and reapplication behavior—to alternative sample definitions. We either vary the severity of the sample restrictions based on age and education or the length of the look-back period.

Age restricted to under 24 years: In India, college completion typically occurs between the ages of 20 and 22, depending on the length of the bachelor's degree. We use a two-year look-back period of non-participation in Group exams to define first-time applicant status. If we further restrict the sample to individuals under age 24, the likelihood of misclassifying repeat applicants as first-timers is minimal. Appendix C.8 reports these results and finds a similar pattern to the preferred sample.

No age or education restrictions: Our main sample restricts to college graduates under age 30. Appendix C.9 shows that our core results remain similar without these restrictions.

One-year look-back period: We now consider a modified definition of first-time applicants using a one-year (rather than two-year) look-back period. Specifically, we classify as first-time applicants those who applied to either the Group 2 or Group 4 exams in 2013, but not to any of the three exams notified in 2012. While this approach may increase the risk of misclassifying applicant status relative to our preferred two-year definition, it enables us to track exam attempts over a longer, seven-year period from 2013 to 2019. Results presented in Appendix C.10 are qualitatively similar: reapplication rates over time remain lower for women among the top-quartile of baseline scorers, even in the additional sixth year. One difference is worth noting: within this high-performing subgroup, women are equally—rather than more—likely than men to reapply at least once over the six-year follow-up period, conditional on baseline performance and other characteristics.

2.8 Summary

Our pipeline results indicate that initial differences in application and performance contribute a small share of the observed gender gap in top-scorers. Instead, two factors are central to understanding women's lower success. First, women are less likely to reapply continuously and persist in the recruitment process over longer time horizons, particularly beyond four years of attempts. This matters because a substantial share of successful candidates—42% in 2019—were selected only after more than four years of attempts. Second, although women have better average exam ranks across attempts, they are less likely to reach the top of the distribution in

later years. This combination of lower long-term reapplication rates and lower likelihood of top-end performance contributes most significantly to the observed gender gap in top-scorers.

3 Drivers of Gender Differences in Persistence and Performance

In this section, we investigate the potential drivers of gender differences in exam persistence and performance that determine entry into these highly desirable civil service careers. Drawing on our own qualitative fieldwork and existing literature on gendered norms surrounding marriage and employment in the Indian context (see e.g., Jayachandran, 2015, for a review), we focus on the role of marriage market and household pressures as primary influences shaping men's and women's attachment with the recruitment process. We provide empirical support for these mechanisms using a combination of administrative data, an original survey of active applicants, and an information experiment embedded within the survey.

We begin by outlining a simple conceptual framework in section 3.1 that characterizes the decision-making environment and trade-offs facing male and female candidates. We then describe our survey and experimental design in section 3.2. Section 3.3 presents empirical evidence for our preferred explanation, while section 3.4 considers a range of alternative explanations, including gender differences in behavioral factors such as risk preferences and aversion to negative feedback.

3.1 Framework

Nearly 75% of our college-educated first-time applicant sample is single. For these individuals, the decision to pursue civil service careers coincides with critical life decisions regarding marriage and private labor market entry. Men and women face distinct marriage and labor market pressures during this time. Women are expected to marry earlier than men: 70% of college-educated women in Tamil Nadu aged 25–29 are married compared to just 30% of men (NSS, 2013). On the flip side, men are expected to work, and employment rates among college-educated men are twice as high as among women above age 25 in the 2011 Census (see Appendix A.3). These differences shape the time horizon over which men and women can realistically pursue exam attempts and the costs they incur for delaying other life events.

We outline a simple two-period model below to emphasize how gendered constraints shape trade-offs around civil service exam participation, marriage, and labor market entry differently for men and women.

Setup: In period 1, individuals choose whether to prepare for the civil service exam or pursue an outside option: private employment for men, marriage for women.[29] In period 2, outcomes depend on the success or failure of the exam attempt. If successful, with probability p, the

[29]For simplicity, we assume that women do not have the option to work in the private sector. This assumption is motivated by two factors: (i) female employment rates are substantially lower than male employment rates, and (ii) women and their families strongly prefer public sector employment due to its perceived advantages in status, job security, physical safety, and compatibility with domestic responsibilities (see Appendix A.4, part C).

individual receives a government job with wage w_g and marriage quality q_g. If unsuccessful, with probability 1-p, men fall back on private sector work (w) while women remain out of the labor force, and both receive marriage quality q. We assume $w_g > w$ and $q_g > q$: civil service jobs are both economically and socially desirable, offering job stability, status, and improved marriage market prospects and greater intrahousehold bargaining power.

To account for variation in women's willingness to delay marriage in pursuit of a civil service job, we introduce a parameter γ_i, which captures heterogeneity in work preference or, alternatively, distaste for home production. Women with higher γ_i derive greater utility from wage work and are more willing to forgo early marriage, with quality q_m, in exchange for the uncertain but potentially higher returns associated with civil service employment. In contrast, women with low γ_i place greater value on early household formation and are more likely to marry immediately, exiting the competition. We assume $q_m > q$, given social norms that suggest lower spousal quality for older women (Vogl, 2013; Anukriti and Dasgupta, 2017; Andrew and Adams, 2022), but do not assume a ranking between q_m and q_g.

We begin by analyzing the trade-offs faced by single men and women, and then consider the implications for participation of married women.[30]

Single men: In the first period, single men choose between preparing for the civil service exam or entering the private sector; that is, marriage is only possible in the second period. Their first-period decision therefore depends on the expected benefits of public employment—both higher wages and higher marriage quality—relative to guaranteed private sector earnings. Given the low probability of obtaining a civil service job (p), the high rates of male participation we observe suggest that men perceive the combined labor and marriage market returns to civil service employment to be substantial. Because men face no penalty for delaying marriage, they can invest in exam-taking without incurring a loss in marriage quality in the first period. As a result, even in the face of long odds, single men are willing to enter—and, if we extend the model to multiple periods, persist in—the competition rather than opt for immediate private sector entry.

Single women: In contrast, single women must decide whether to marry in the first period—receiving marriage q_m—or to delay marriage and invest in the civil service exam process. This decision involves trading off a guaranteed match against the uncertain benefits of public employment, which include both wage income and (potentially) improved marriage outcomes.[31] Given the low probability of success and the absence of a private sector option, the cost of failure is especially high: women remain out of the labor force and receive marriage quality q, reflecting both the loss of early marriage prospects and limited economic alternatives.[32]

[30] We omit married men from this discussion and subsequent analysis, as they constitute a small share (3%) of first-time applicants. While this suggests that marriage may also limit men's participation, consistent with a male breadwinner norm, single men face less social pressure around marriage timing and therefore do not face the same constraints as single women.

[31] While delaying may reduce the quality of matches available, obtaining a public sector job may improve autonomy, status, and bargaining power within marriage. Given near-universal marriage in our setting, we do not consider the possibility that women risk remaining unmarried altogether.

[32] These high costs are consistent with news reports and our fieldwork, which suggest that women have shorter windows in which to succeed than men and receive less support from their families. For example, one female aspirant

This structure implies that women with higher γ_i are more likely to pursue exam attempts. If γ_i is positively correlated with ability, this mechanism predicts that single women who apply will be stronger performers, on average, than their male counterparts. Moreover, if the model were extended to multiple periods, these dynamics would become even sharper: because marriage quality declines with age, the cost of delaying marriage would increase more steeply for women than for men, further constraining their ability to persist in the competition. Furthermore, if ability is rewarded in the marriage market, then women with higher ability will face greater pressure to drop out of exam process.

Married women: The bulk of the remaining first-time applicants are married women (22%). Qualitative accounts suggest that most women are encouraged—or expected—to exit the competition upon marriage due to their expanded household obligations.[33] Women who therefore apply after marriage therefore must either be unusually motivated or receive exceptional support from spouses or in-laws. In our framework, these women must overcome not only the uncertainty of the exam process but also the additional time and effort required to prepare while managing domestic responsibilities. As a result, we expect married women in the applicant pool to be positively selected—i.e., have high γ_i and likely high-ability.

Yet, household obligations may constrain their ability to persist. Preparing for exams while married can introduce additional stress or conflict with traditional gender roles, lowering marriage quality in the event of failure.[34] While married women who apply may perform well on their first attempt, they may be more likely to exit the competition after a failed attempt due to the high personal and household costs of continued participation.

Summary: The model highlights how a seemingly gender-neutral competition—based largely on exam performance—interacts with life-cycle constraints and gender norms to shape who participates and persists. While a public sector job may be transformative for all individuals, the costs and returns to sustained investment in the exam process differ sharply by gender.

3.2 Candidate survey and information experiment

To better understand the background and experiences of applicants, we conducted surveys with men and women who were actively preparing to take Group exams in 2022. As part of the survey, we embedded an information experiment to provide new, truthful information about the difficulty of success to respondents and to track how this affected subsequent behavior. While the survey provides rich descriptive data on candidate characteristics and motivations, we are unfortunately unable to link individual survey responses to the administrative data used in the rest of the analysis.

observed: "After a few attempts, women are forced to get married and there end their dreams" (Shantha, 2021). See Appendix A.4 for additional quotes.

[33] Among first-time applicants, we observe less than 1% of single women reapplying with a changed marital status. This suggests that most women exit the exam process upon marriage.

[34] Given norms of patrilocal residence, married women are often expected to care for their husbands, children, and in-laws. Even women in supportive households report studying only after completing domestic responsibilities (see Appendix A.4, part B).

Sampling and recruitment: To ensure that survey responses captured candidates at a time when exam preparation was salient, we launched our survey around the announcement of a major TNPSC Group exam. In late March 2022, the TNPSC announced a Group 4 exam, with the registration period open through late April and the exam scheduled for late July.[35] We fielded the survey between mid-May and mid-July.

Individuals interested in taking the upcoming Group exams were recruited primarily through targeted Facebook advertisements across Tamil Nadu. Respondents who clicked on the ads were redirected to an external website where they could complete the survey in either Tamil or English. The survey collected information on candidates' personal and family backgrounds, labor market experiences, and beliefs and attitudes related to competitive exams, jobs, marriage, and gender. A total of 3,510 individuals successfully completed the survey.

Information experiment: As part of the applicant survey, we randomly provided respondents with truthful information about TNPSC Group exams and then gathered data on their subsequent attachment to the process. Respondents in the control group were shown the number of participants in the most recent Group exam. Those in the treatment group were shown this information along with the distribution of prior attempts among successful candidates in the same exam.[36] See Appendix B.1 for visuals used in the experiment.

While the number of applicants is often reported in public sources, data on the number of attempts made by successful TNPSC candidates is, to our knowledge, not publicly available. Consistent with this, over two-thirds of respondents underestimated the share of successful candidates who had made at least 3 exam attempts (see Appendix C.3.2).[37] This suggests that respondents, on average, underestimate the sustained investment required for success. This is true across subgroups of single men, single women, and married women, with minimal differences between groups as well.

We also cross-randomized whether respondents were shown a module of five questions about marriage, household responsibilities, and their potential effects on exam preparation *before* the information treatment (see Appendix B.2 for the module). We refer to this variation as the "Household (HH) prime." The purpose of this prime was to increase the salience of household constraints and assess whether such considerations would influence how individuals responded to the information treatment.

This design resulted in four experimental groups: Information, HH prime, Information $\times$ HH prime, Control. Our central aim was to shift respondents' beliefs about what success in Group exams requires, and to assess whether responses to this information varied by gender and marital status.

[35] Due to COVID-related delays, it was also widely expected that Group 1 vacancies would be announced soon, which ultimately occurred in late July 2022.

[36] Candidates were first asked whether they planned to take the Group 1 or Group 4 exam in the upcoming year. Based on their response and random assignment, they were then shown information pertaining to the most recent Group 1 or Group 4 exam. If a respondent selected both exams, we defaulted to Group 4, since it had already been scheduled and the information was more immediately relevant. Roughly 90% of respondents were assigned to receive Group 4 information.

[37] Prior to treatment, we asked: "Out of X successful candidates, how many do you think were selected only after three or more attempts?"

Summary statistics: In Table 6, Panel A, we provide summary statistics on the personal and household background of survey respondents, disaggregated by gender and marital status to reflect the distinctions emphasized in the framework above. We focus on three groups of respondents: single men, single women, and married women.[38]

Single men are, on average, 1.2 years older than single women, but 2.6 years younger than married women. A majority of married women (72%) have children, compared to just 3% of single women; 1 out of 1,398 single men report having children. Household income is broadly comparable across groups, with 83–84% of respondents living in households earning less than Rs.20,000 per month. While a majority of all candidates have parents with less than a 10th-grade education, single men have less educated parents than either groups of women. Single men are also more likely to belong to a lower-caste background.

Both groups of women are more likely to have a college degree and to perform better in 10th-grade standardized exams compared to single men. Because we lack TNPSC exam scores for survey respondents, we use these standardized exam scores as a proxy for ability in our survey-based analyses.[39]

To assess selection into the survey, we compare survey respondents to all 2019 applicants, the closest comparable year available in the administrative data (see Appendix C.2, Panel A). Single men and women are of similar ages, but we observe younger married women in the survey relative to the administrative data. Across all three subgroups, survey respondents are more likely to be college graduates, but less likely to be from the SC/ST caste.[40]

3.3 The role of marriage and household pressures

We now turn to empirically examine whether marriage and household pressures are a key driver of gender differences in participation and performance. We present three complementary pieces of evidence. First, we use detailed survey data on marriage norms, family expectations, and household support to establish the relevance of the trade-offs outlined in the framework for TNPSC applicants. Second, we return to the administrative data and examine participation and reapplication behavior by baseline marital status—comparing single men, single women, and married women. Finally, we present experimental evidence on how these groups respond to information about difficulty of success in TNPSC exams.

3.3.1 Survey evidence

In Table 6, Panel B, we document that women's exposure to the marriage market begins earlier than men's. Conditional on ever receiving a marriage proposal, both single and married women reported a first proposal around age 21, compared to age 24 for single men. This difference

[38] Only 5.6% of survey respondents were married men, consistent with their low share in the administrative data. We exclude them from our analysis.

[39] To the extent that ability is correlated over time and 10th-grade exam performance is predictive of TNPSC outcomes, these scores serve as informative proxies for underlying ability—allowing us to examine behavioral differences between higher- and lower-ability individuals.

[40] Unfortunately, we did not collect information on the type of college degree or the language of high-school instruction in the survey.

partly reflects parental expectations: on average, single women would prefer to delay marriage by 1.5 years relative to their parents' ideal marriage age for them, compared to a gap of just 0.6 years for men.[41] Among single respondents, we also find that higher-ability women, as proxied by 10th-grade exam scores, are more likely to have received a marriage proposal than lower-ability women or similarly-performing men (see Appendix A.7.1). This pattern suggests high-performing women likely face *greater* pressure to marry early, consistent with recent evidence documenting returns to education in the marriage market (e.g., Andrew and Adams, 2022).

To assess household support for exam preparation, we collected data on candidates' exam investments and the sources of this funding. A majority of candidates report having spent money on exam-related expenses—such as coaching classes, study materials, or accommodation for studying outside the home—financed either through personal savings/income or support from their family and friends. Women, especially married women, are more reliant on external support due to limited access to personal income.[42] Yet, single men receive significantly more network-based support than either single or married women (Rs.4,794 vs. 3,491 and 2,793, respectively).[43] Men are also about 10 p.p. more likely than women to have stayed outside the home to prepare for the exam, which may allow greater focus on preparation.

Importantly, across the 10th-grade score distribution, single men receive more household support than either group of women (see Appendix A.7.2). The gap between single women and men narrows as exam scores increase; however, married women receive substantially less support at all levels of ability. This suggests that women receive greater support from their own parents than from their in-laws, consistent with anecdotal reports from our fieldwork (see Appendix A.4, part B).

3.3.2 Heterogeneity in participation and reapplication by baseline marital status

To directly examine how marriage and household pressures shape exam-taking behavior, we turn to the administrative data to analyze how *baseline* marital status affects both initial participation and reapplication patterns. This analysis uses our preferred sample of first-time applicants: college graduates under the age of 30.[44]

Initial participation and performance: Figure 6 shows the cumulative age distribution at first exam attempt for single men, single women, and married women. Single women begin taking the exam at younger ages than single men, consistent with the idea that women anticipate mounting marriage pressures as they grow older.

Turning to baseline exam performance, we find that married women score significantly higher on their first attempt than both single women and men (see Table 7, columns 1–2). Given the household constraints they face, this likely reflects positive selection into participation among

[41] To measure parental preference, we asked single respondents: "What is your parents' ideal age of marriage for you?"

[42] This is consistent with broader labor market patterns: if women are less likely to work, they have fewer opportunities to self-finance exam preparation.

[43] Conditioning on those who receive any support from their networks reveals even starker figures: Rs.18,413 for men vs Rs.11,805 for single women and Rs.8,042 for married women.

[44] See Appendix C.2, Panel B for summary statistics for this sample separeted by marital status.

married women—consistent with the implications of our conceptual framework. However, despite their stronger average performance, both single and married women are less likely to reach the top of the score distribution (columns 3–6).

Reapplication: Table 8 examines reapplication over the five-year follow-up period for unsuccessful candidates in 2014. We again consider whether individuals ever reapplied (columns 1–3) and whether they reapplied continuously (columns 4–6), presenting estimates without and with baseline controls (Panels A and B). Because applicants can choose between exams with different levels of investment, we separately analyze reapplication patterns for multi-stage and single-stage exams to assess how preferences vary across subgroups.

Compared to single men, married and single women are *more* likely to ever reapply (column 1), but *less* likely to reapply continuously (column 4).[45] Disaggregating by exam type reveals distinct patterns. Married women are significantly less likely to ever reapply to a multi-stage exam compared to both single men and single women (column 2), while no significant difference is observed between single women and men. In contrast, both groups of women are more likely to reapply to single-stage exams than single men (column 3). Since single-stage recruitments typically require lower investments of time and resources, these patterns are consistent with household constraints shaping women's application strategies—especially for married women.

Yet even though women adapt their strategies by targeting lower-investment opportunities, sustained participation remains difficult. Both married and single women are significantly less likely to keep reapplying to multi-stage exams than single men (column 4). For single-stage exams, single women are significantly less likely than single men to reapply continuously; the coefficient for married women is negative but not statistically significant (column 5). One possible explanation is that married women may have more time to devote to lower-investment opportunities if they are less likely to be employed outside the home.

Finally, we examine whether younger women—who begin the exam process earlier—are more likely to persist. We do not find this to be the case. Figure 7 shows a binned scatterplot of reapplication rates among the top-quartile of scorers by age at first attempt, controlling for baseline exam performance and exam type. Across the age distribution, a greater share of single men reapply continuously compared to both single and married women.

3.3.3 Experimental evidence

To complement the descriptive and observational evidence presented above, we now turn to the information experiment described in section 3.2. The main advantage of this design is that it allows us to manipulate the informational environment in a uniform way across gender and marital status. While differences observed in the previous sections may reflect variation in beliefs or access to information, the information treatment standardizes the signal, allowing us to assess how gender and marital status shape preferences over exam-taking.

We begin by documenting that the information treatment successfully shifted beliefs about

[45] The coefficient for married women is negative in Panel A, column 1, but becomes positive once we control for age and other variables; given this, we report Panel B estimates in the text.

the difficulty of success. Appendix C.3.3 shows that respondents with priors below the true value—a majority of the sample—revise upwards their expectations about the share of successful candidates who will have taken three or more attempts.[46]

Table 9 presents treatment effects for our main outcome of interest: the (hypothetical) number of attempts an individual is willing to make.[47] For simplicity, we estimate intent-to-treat effects, presenting estimates without and with baseline controls (Panels A and B, respectively).[48] Given the smaller sample sizes in the information experiment, we prefer to not impose age and education sample restrictions; however, our results are robust to restricting the survey sample to college graduates under the age of 30 (see Appendix C.11).

The information treatment has strikingly different impacts across the three subgroups. Among single women, it reduces the number of desired attempts by 12–14% (p <0.01, column 2, Panels A and B). In contrast, we find no significant effects for single men or married women. In Appendix C.3.4, we show that although respondents with lower priors exhibit stronger belief updating, the treatment effects on exam-taking preferences for single women are concentrated among those whose initial beliefs were closer to the truth.[49]

We next examine the effect of combining the information treatment with the household responsibility (HH) prime, which makes family obligations salient. Among married women, this combined treatment has a strong negative impact on the number of desired attempts, suggesting that reminders of household responsibilities—when paired with information about the difficulty of success—further discourage sustained participation (column 3). Interestingly, the HH prime on its own has no significant effect for single men or single women, but it increases the desired number of attempts among married women. This pattern is consistent with those married women selecting into the recruitment process who have a relatively high preference for paid work (γ).

To further explore the role of marriage pressure, we examine heterogeneity by whether the respondent has previously received a marriage proposal. Our hypothesis is that single women who have already received a proposal face greater pressure to marry—or may be more attuned to the costs of delaying marriage—than those who have not. Appendix C.12 presents these results. Among single women, the negative effect of the information treatment is nearly twice as large for those who have received a proposal compared to those who have not. In contrast, we find no

[46] After the treatment was delivered, we asked all respondents to estimate how many successful candidates in the upcoming exam would have taken three or more attempts.

[47] Specifically, after the information treatment was delivered, we asked respondents: "Knowing what you know now, what is the maximum number of attempts you would be willing to make in the Group [1/4] exam?", where Group 1/4 was shown as per the exam stratum assigned to the respondent.

[48] We implement the following specification:

$$Y_i = \beta_1 Info_i + \beta_2 Info_i \times HHprime_i + \beta_3 HHprime_i + \gamma_s + \epsilon_i \quad (4)$$

where Y_i is the outcome of interest for individual i. γ_s are fixed effects for the exam strata, i.e. whether the respondent was shown information about Group 1 or 4. $Info_i$ is an indicator for those who received information about the distribution of attempts made by successful candidates; $HHprime_i$ is an indicator for those who received the household prime module; and $Info_i \times HHprime_i$ is the interaction term. We also report effects after controlling for a range of respondent characteristics: age, caste, household income, parental education, number of siblings, 10th grade exam performance, and board exam type.

[49] This pattern is inconsistent with standard Bayesian updating, which predicts that individuals with the largest belief errors should exhibit the greatest movements. A lack of standard Bayesian learning has been documented in other studies from similar contexts (see e.g. Jones and Santos, 2022; Fernando and Singh, 2025).

such differential effect among single men. However, given the small sample sizes here, we view these results as merely suggestive.

3.3.4 Summary

The three types of evidence presented support the interpretation that marriage and household constraints play a more prominent role in shaping women's exam-related decisions than men's. Single women have a more supportive household environment, but they face increasing pressure to marry over time. Married women, while positively selected into the exam process, struggle to persist due to competing household obligations. Although much of our analysis focused on reapplication, these findings also suggest that even women who do reapply likely face more challenging preparation environments.

3.4 Alternative explanations

We now discuss several alternative explanations that may contribute to gender differences in participation and performance. Specifically, we examine: (i) differential access to information and networks; (ii) behavioral factors such as risk or feedback aversion; (iii) variation in outside labor market opportunities; and (iv) gender differences in technical ability at the upper end of the score distribution. Our goal in this section is not to definitively rule out these channels, but rather to assess their relative importance. The overall evidence suggests that while some of these factors play a role, they are likely less consequential than the marriage and household constraints discussed above.

3.4.1 Differential access to information and networks

Due to lower life-cycle investments in women and greater mobility constraints (see e.g. Bharadwaj et al., 2014; Uteng, 2012), women may have more limited access to credible information and peer support related to the recruitment process. For example, since there is minimal public information about successful candidates or their strategies, women who are less likely to know successful applicants or interact regularly with other aspirants may face greater informational barriers. Even in the absence of such barriers, a lack of support networks could reduce motivation and sustained engagement.

However, our survey and experimental data provide evidence against information access as a primary driver of observed gender differences. First, the distribution of prior beliefs about the difficulty of success is broadly similar across groups, with substantial overlap between single men, single women, and married women (Appendix C.3.1). Second, the experimental results indicate that improving the information environment actually reduces single women's willingness to reapply, while having no significant effect on single men or married women. These patterns are inconsistent with a story in which women's persistence is constrained by inaccurate beliefs alone.

To assess the role of peer networks, we asked respondents whether they personally knew

anyone selected for a TNPSC position. About one-third of all respondents did, with minimal differences across gender and marital status groups (Table 6, Panel C), including among high-ability candidates (Appendix A.7.3). Similarly, roughly 42–45% of respondents reported knowing other candidates they could rely on for exam-related support, such as sharing materials or encouragement. While high-ability married women do report weaker peer networks (Appendix A.7.4), we also show that they are also positively selected and more likely to reapply at least once than single men.

3.4.2 Behavioral factors

A large literature has explored gender differences in willingness to compete and their potential sources, such as risk-aversion, overconfidence, or feedback aversion (see Niederle and Vesterlund, 2011, for a review). In our context, women are willing to enter—and re-enter—a high-stakes competitive tournament at rates similar to or higher than men. This suggests that women do not have a latent distaste for competition relative to men. However, women are less likely to sustain participation over multiple years. This distinction raises the possibility that gender differences in behavioral traits may still shape persistence, even if they do not deter initial entry.

To explore this, we asked survey respondents about their preferences for competition and risk.[50] On average, single women report higher scores on the competition scale than single men and married women (Table 6, Panel D). Across the 10th grade score distribution, we find a positive relationship between competitiveness and exam scores for both groups of women, but a flat relationship for single men (Appendix A.7.5). Among high-performing applicants, single and, to a lesser extent, married women report being more competitive than single men.

Turning to risk preferences, we find that single men and women report similar willingness to take risks, both on average and across the 10th-grade score distribution (Table 6, Panel D; Appendix A.7.6). In contrast, married women exhibit significantly lower willingness to take risks across the ability distribution, with an average difference of approximately 0.2 standard deviations relative to single men and single women. This pattern could reflect either the effect of marriage in reducing women's risk tolerance or selection into marriage or survey participation. In either case, lower willingness to take risks may help explain married women's lower rates of continuous reapplication. However, this mechanism cannot explain the lower reapplication rates observed for single women (see Table 8, columns 4–6).

Another commonly cited behavioral channel is feedback aversion. Prior research suggests that women may respond more negatively to performance feedback or have lower confidence in their future ability relative to men (see e.g., Buser and Yuan, 2019). However, in our context, both high-scoring married and single women more likely to ever reapply than single men (Table 8), which is inconsistent with stronger feedback aversion or lower confidence among women. If anything, these patterns suggest that women respond constructively to performance signals in their early exam attempts.

[50] For competition, we asked how well this statement— "Competition brings out the best in me."— described the respondent on a scale of 1 (not at all like you) to 7 (exactly like you). For risk-taking, we asked respondents how willing they were to make a risky decision on a scale of 0 (completely unwilling) to 10 (very willing).

Taken together, we find limited evidence that gender differences in behavioral traits can fully account for the observed gaps in exam-taking behavior. The combination of administrative and survey data points away from competition preferences or feedback aversion as primary drivers. However, risk preferences may still play a role. While the absolute difference in risk-taking among high-scoring individuals is modest, even small differences can compound over time in high-stakes, repeated settings—potentially contributing to differential persistence.

3.4.3 Outside options in the labor market

Another potential explanation is that women may be less inclined to continue competing because they have better outside options in the labor market. However, this is difficult to reconcile with broader patterns of female employment in India (see Appendix A.3) and documented gender wage gaps even among salaried and highly educated workers (Deshpande et al., 2018).[51] Still, it is possible that the labor market options for high-performing, motivated individuals pursuing elite civil service jobs differ from those of the broader population.

Ideally, we would observe employment outcomes for male and female candidates who just missed the TNPSC selection cutoff, but such data are not available. Instead, we use the applicant survey to examine employment experiences and outside options for candidates actively pursuing Group exams. Even among this relatively educated and motivated group, we find a 20–25 p.p. gap in employment: single men are substantially more likely to have ever worked or to be currently employed compared to single or married women (Table 6, Panel E). These gaps persist across the ability distribution (Appendix A.7.7 and A.7.8): high-scoring women, regardless of marital status, are less likely than high-scoring men to be engaged in the labor market.

We also directly asked respondents about their labor market options if they were not studying. Strikingly, 44% of married women and 30% of single women said they would not be engaged in paid work, compared to only 14% of men (Table 6, Panel E). Among those who would be working, men reported higher potential earnings than either group of women, with differences of Rs. 2,150–3,950. These gaps also remain substantial when comparing high-scoring men and women (Appendix A.7.9 and A.7.10). Overall, these patterns are not consistent with higher-ability women having more attractive outside options than men.

3.4.4 Differences in STEM ability at the top

Could gender differences in reaching the top of the score distribution simply reflect differences in technical or STEM-related ability? Evidence from both high- and low-income countries around the world suggests this may be a common pattern in math achievement (Bharadwaj et al., 2012; Ellison and Swanson, 2023). While we are not able to fully rule out this explanation—particularly since success in highly competitive settings often hinges on small differences—several features of our context suggest that top-end technical ability is likely a less important factor.

First, the TNPSC exams are not heavily weighted toward advanced math or science content.

[51] Qualitative fieldwork suggests that women are especially drawn to public sector jobs because they (i) are more likely to be supported by in-laws relative to private-sector jobs, and (ii) are seen as better suited for balancing work and family responsibilities. See Appendix A.4 for quotations.

Quantitative and logical reasoning questions are restricted to the 10th-grade level and account for only about 15% of the total across different types of exams. Anecdotal evidence from the last decade consistently shows that women outperform men in standardized high school exams even at the top.[52] Though admittedly selected, our survey data also shows that women are well-represented in the top of the 10th-grade score distribution (Appendix C.5).

Second, 85% of successful candidates in our sample period hold undergraduate degrees in either Science or Engineering, with an equal split between the two. Women are more likely to have a B.Sc. degree, while men are more likely to hold a B.Eng. degree. Given the structure of the exam and the relative parity in subject backgrounds, there is little reason to believe women are systematically less capable of excelling at the relevant content.

Finally, the gender gap in top-scorers is most pronounced in the less elite Group 2A and Group 4 exams, rather than in the more selective Group 1 and Group 2 recruitments (Table 1). Consistent with this, separating baseline exam performance by exam type reveals that single and married women are less likely to be top-performers in Group 4 exams (Appendix C.13). If technical ability were the primary constraint, we would expect the opposite pattern: stronger gaps at the top for the most demanding exams.

4 Discussion & Conclusion

4.1 External validity

We use unique administrative data from the state of Tamil Nadu to examine how gender shapes access to elite public sector careers. Within India, Tamil Nadu likely represents a best-case scenario for women's access to high-wage, high-status jobs. Other major states report a lower share of female entrants to the bureaucracy—ranging from 20% to 34% in recent years.[53]

Tamil Nadu is one of India's richest and most socially progressive states. It was the first to implement gender quotas in public employment (in 1989) and has achieved near gender parity in college attainment among recent cohorts. Yet, significant gender gaps in marriage timing and labor force participation remain, underscoring that educational gains alone do not ensure equal labor market outcomes.

Our setting is also a favorable one to isolate supply-side drivers of gender inequality. Hiring is based on standardized exams with minimal employer discretion, and the jobs themselves are widely viewed as family-friendly and high-status, with limited social pressure on women to exit after marriage. If gender gaps in entry persist even in this environment, the barriers are likely to be even greater in discretionary or less accommodating competitive settings in the private sector. Indeed, women remain underrepresented in other prestigious professions, comprising just 29% of allopathic doctors and 15% of lawyers in India (Singh et al., 2024; Krishna, 2024).

[52] In the Tamil Nadu State Board 12th grade exams in 2018, among 231 students scoring above 1180 out of 1200 in Chennai district, 181 were girls and just 50 were boys (Indian Express, 2018). Across Tamil Nadu, 78% of girls and 65% of boys scored above 60% in secondary school exams in 2024 (Ministry of Education, 2025).

[53] Compiled from annual reports of state-level Public Service Commissions and news articles across five states: Assam, Odisha, Rajasthan, Maharashtra, and Uttar Pradesh.

Beyond India, many lower-income countries share similar institutional and cultural features: intense competition for public sector jobs, exam-based recruitment systems, and conservative gender norms. Our findings therefore offer broader insights into how supply-side constraints can limit women's advancement in high-stakes, competitive labor markets.

4.2 Policy implications and future work

Our findings show that intense competition for civil service jobs imposes differential burdens on men and women, ultimately shaping is able to sustain participation over the long-run and, by extension, the gender makeup of the bureaucracy. While our analysis focuses on gender, such competition may also limit diversity along other margins, such as caste or socioeconomic status. Given the resources and support required to remain in the recruitment process, the intended meritocratic nature of exam-based hiring may be undermined in settings with extreme competition. This cost to diversity is distinct from—but exists alongside—the *social* costs of extreme competition, which leads talented and motivated young individuals to spend critical years in exam preparation, often with limited long-term returns (Mangal, 2024).

A promising policy lever to blunt the diversity costs—or reduce the broader social costs—of prolonged preparation may be to limit the number of exam attempts, as done by the Union Public Service Commission. However, such restrictions may also lead candidates to delay entry or invest more intensively from the outset, potentially crowding out the learning and self-selection that early attempts facilitate. Moreover, if men are better positioned to make these early, front-loaded investments, attempt limits may unintentionally exacerbate gender disparities in performance and selection.

These challenges highlight the difficulty of designing recruitment systems that are both competitive and equitable. When constraints vary systematically across groups, preserving fairness in access may require explicit mechanisms to level the playing field. Our findings thus provide a revised rationale for the continued relevance of gender quotas in this context: quotas help offset the gendered barriers that even highly qualified and motivated women face in persisting through lengthy, high-investment selection processes.

An important area for future work is to understand the gendered value of public sector work. If civil service jobs are among the few "acceptable" employment options for women in certain contexts, success or failure in these exams may not only affect career prospects, but also shape marriage outcomes and long-term labor force participation. Understanding how labor market institutions interact with social norms in shaping women's life trajectories remains a key area for future inquiry.

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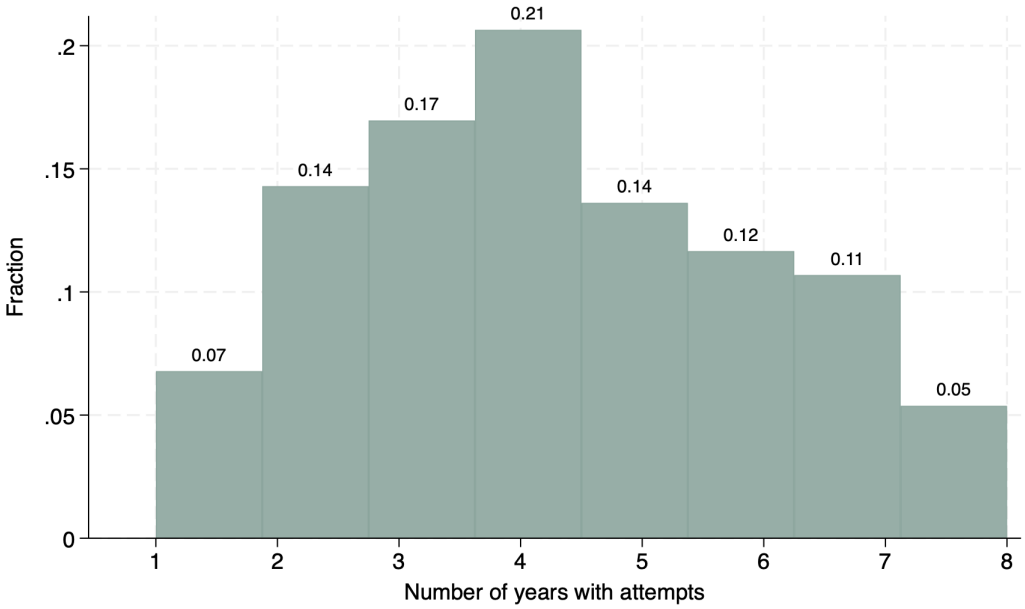
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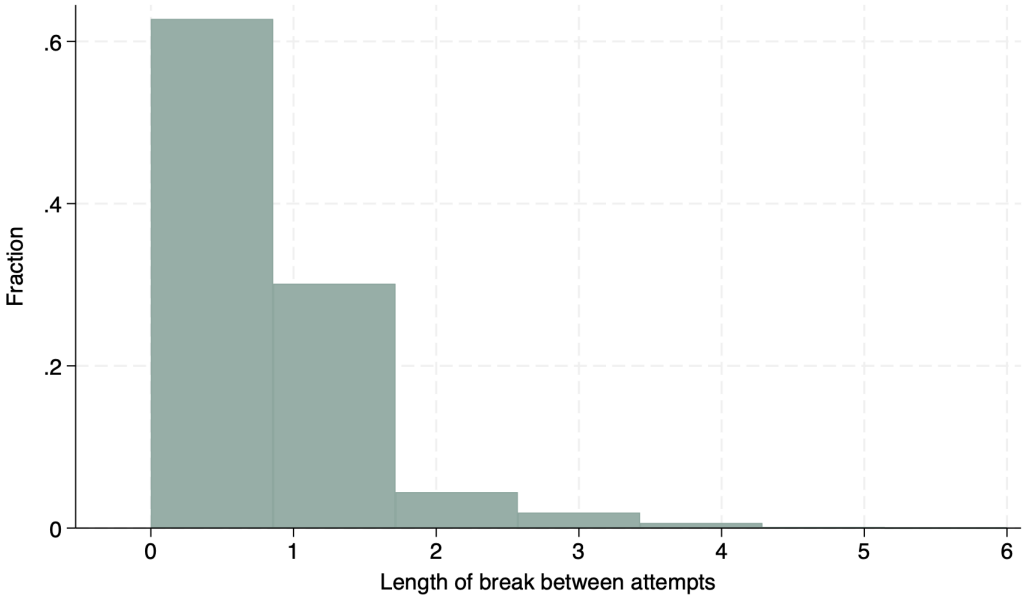
5 Figures

Figure 1: Number of years with any attempts by successful candidates



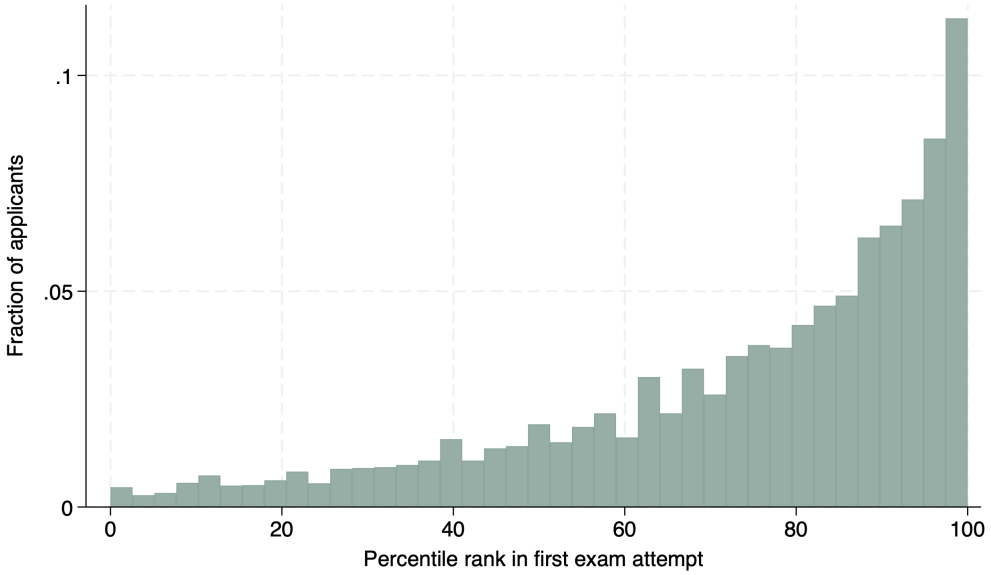
Notes: This figure shows the number of years in which successful candidates from 2019 attempted any Group exam between 2012 and 2019. The sample is restricted to the 9,865 candidates who succeeded in 2019 to maximize the observation window for prior participation.

Figure 2: Break length between Group exams by successful candidates



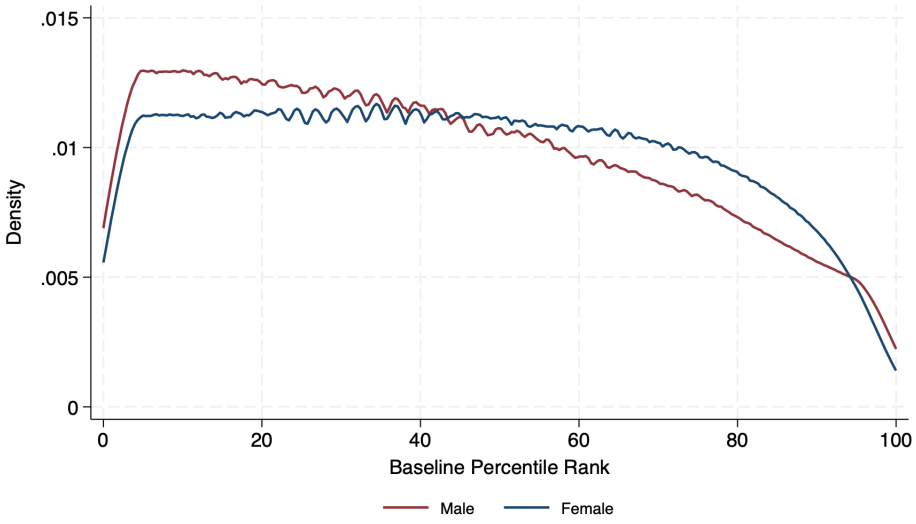
Notes: This figure shows the maximum length of any breaks, measured in years, in appearance for Group exams by successful candidates in 2019. A 'break' is defined as not appearing for the first or only stage of any Group exam in a calendar year. 0 means that the candidate did not take any breaks between attempts in our data.

Figure 3: Distribution of initial exam performance for successful candidates in 2019



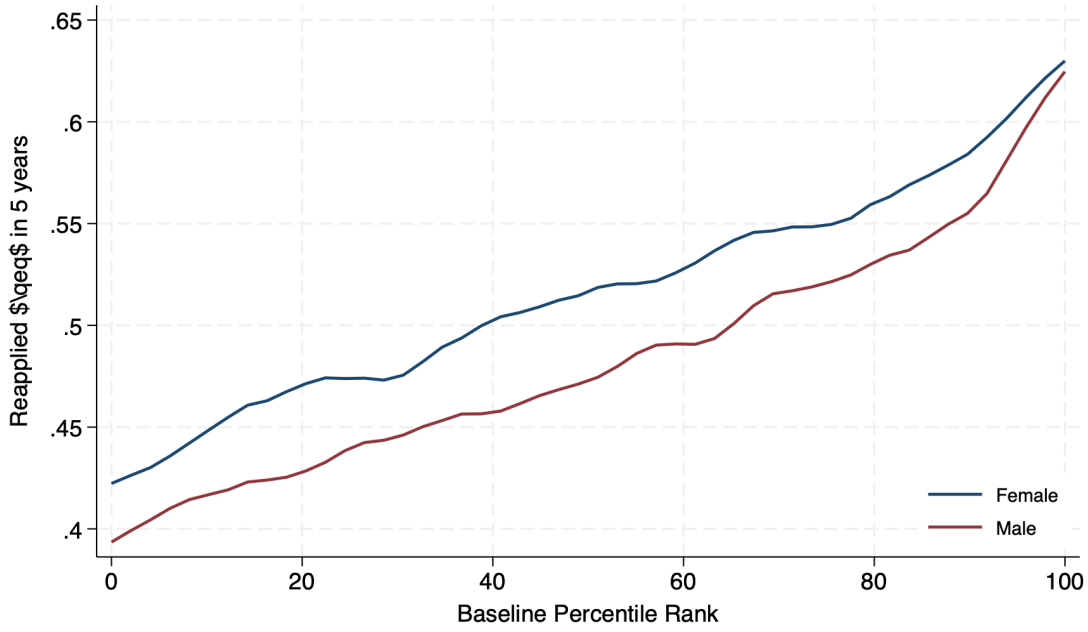
Notes: This figure shows the first recorded exam performance for successful candidates in 2019. The percentile rank reflects the earliest available exam attempt in the administrative data.

Figure 4: Distribution of baseline exam performance for first-time applicants in 2014

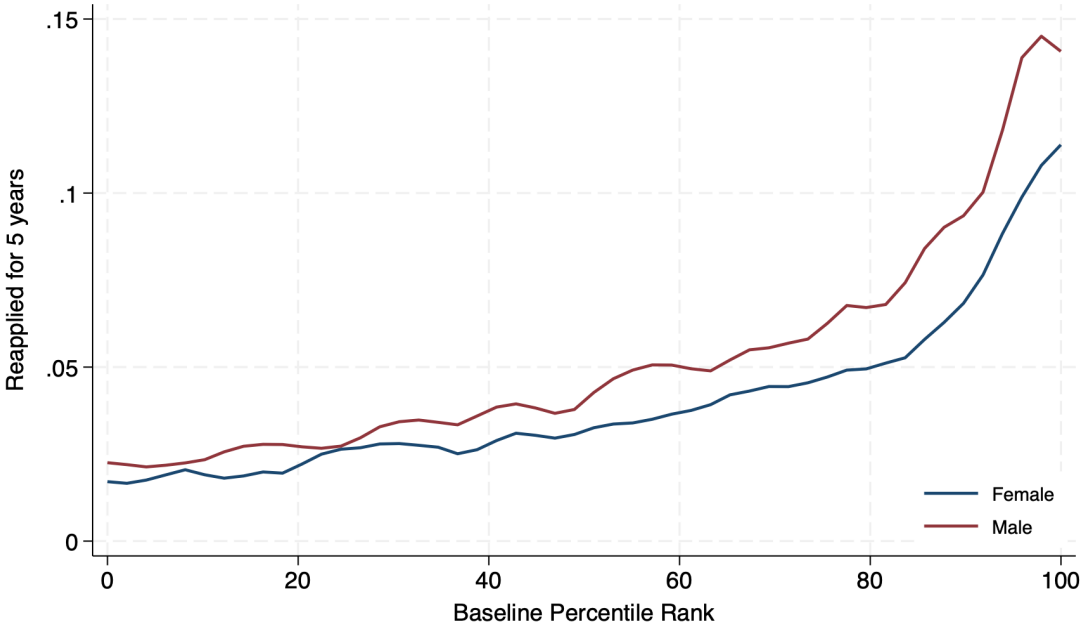


Notes: This figure shows gender differences in baseline exam performance for first-time applicants. A 'first-time' applicant is defined as an individual in 2014 who did not appear for any Group exams in the previous two years (2012 and 2013). We restrict to first-time applicants who are college graduates, under the age of 30, and do not already hold a government job. The "baseline" exam refers to candidates' first exam in 2014.

Figure 5: Reapplication behavior



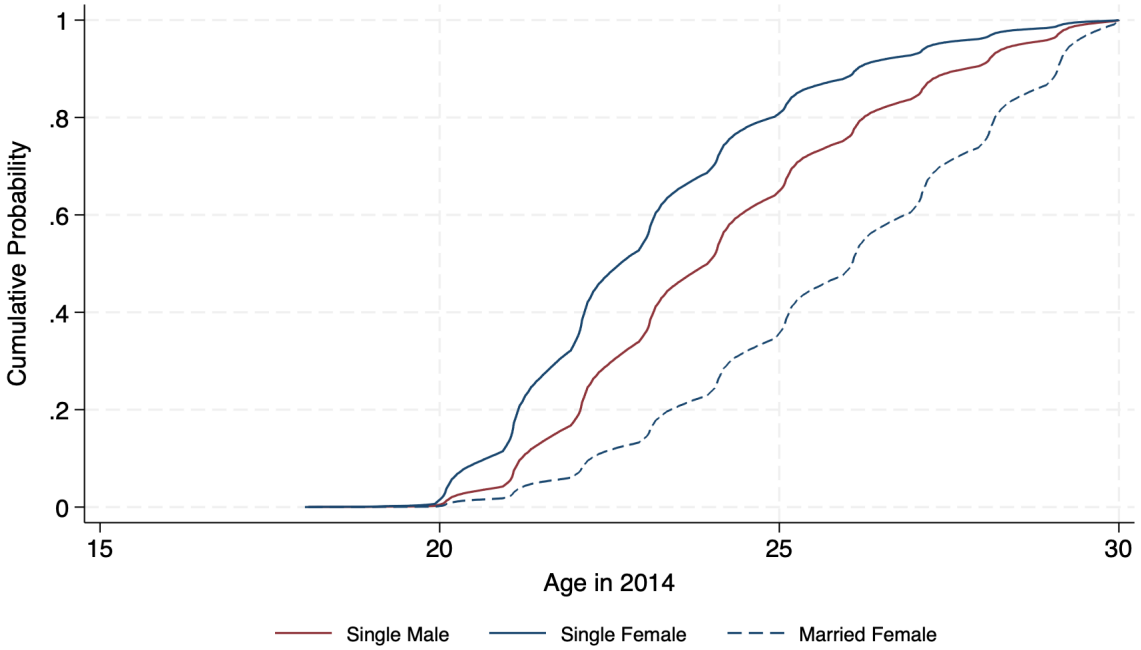
(a) Reapplied at least once in five years



(b) Reapplied continuously for five years

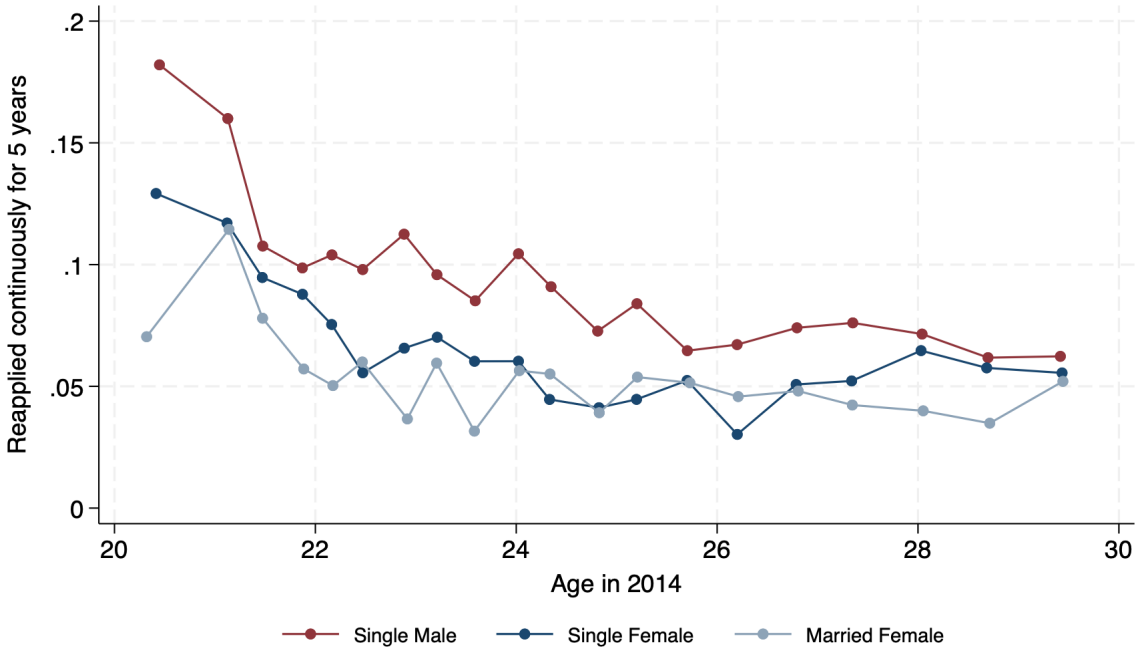
Notes: This figure reports non-parametric estimates of reapplication rates over a five-year follow-up period from 2015 to 2019. Sample is restricted to unsuccessful first-time applicants from 2014. Panel (a) shows the share of individuals who reapplied at least once during this period, while Panel (b) displays the share who reapplied continuously—that is, in every year from 2015 to 2019.

Figure 6: Age at first attempt by marital status



Notes: This figure shows the cumulative distribution of the age at first exam attempt for first-time applicants, separately for single men, single women, and married women.

Figure 7: Reapplication by age and marital status



Notes: This figure shows a binned scatterplot of reapplication rates by baseline age, controlling for baseline exam performance and exam type. The y-axis shows the probability of continuous reapplication over the five-year follow-up period. Sample is restricted unsuccessful applicants from 2014 in the top-quartile of scorers.

6 Tables

Table 1: Competition and female representation, 2013-19

	Vacancies	Competition		Female representation	
Exam	Share of total	Applicants per vacancy	Placement (%)	Share hired	Share top-scorer
Group 1	0.01	1259	0.09	0.61	0.62
Group 2	0.07	408	0.25	0.54	0.53
Group 2A	0.14	232	0.47	0.41	0.35
Group 4	0.79	317	0.45	0.50	0.39
Overall	1	540	0.33	0.49	0.39

Notes: This table shows measures of competition and female representation in civil service recruitment in Tamil Nadu. The data covers 17 Group recruitments conducted between 2013-19. Figures are compiled using publicly available annual reports and administrative data from the TNPSC.

Table 2: Gender differences in baseline characteristics of first-time applicants

	Male	Female	Difference (M-F)	N
	(1)	(2)	(3)	(4)
Panel A: Basic demographics				
Age	24.438	24.108	0.330***	272,432
Married	0.092	0.376	-0.284***	272,432
Caste is SC/ST	0.224	0.190	0.034***	272,432
Birth district is Chennai	0.044	0.042	0.002**	272,432
Panel B: Medium of instruction				
Completed 10th in Tamil	0.746	0.784	-0.038***	272,432
Completed 12th in Tamil	0.749	0.777	-0.028***	265,556
Completed college in Tamil	0.109	0.154	-0.044***	271,857
Panel C: Type of undergraduate degree				
Arts	0.125	0.217	-0.092***	272,432
Sciences	0.345	0.456	-0.111***	272,432
Commerce	0.227	0.201	0.026***	272,432
Engineering	0.286	0.113	0.173***	272,432
Other	0.017	0.013	0.004***	272,432

Notes: This table reports gender differences in baseline characteristics among first-time applicants. Columns 1 and 2 show means for men and women, respectively. Columns 3-reports the difference in means between the two groups. Column 4 is the number of observations. A first-time applicant is an individual who appeared for an exam in 2014, but did not appear in any Group in the previous two years (2012 and 2013). Sample is restricted to first-time applicants who are college graduates under the age of 30 and who do not already hold a government job. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table 3: Baseline exam performance

	Percentile rank		Top 1%		Top-scorer	
	(1)	(2)	(3)	(4)	(5)	(6)
Female	2.408***	2.388***	-0.002***	-0.001***	-0.001***	-0.001***
	(0.105)	(0.110)	(0.000)	(0.000)	(0.000)	(0.000)
Baseline Controls		Y		Y		Y
N	272432	272432	272432	272432	272432	272432
Male Depvar Mean	42.465	42.465	0.004	0.004	0.004	0.004

Notes: This table considers gender differences in baseline exam performance for first-time applicants. The dependent variables are as follows: percentile rank in the first exam taken by applicants (columns 1–2); whether an applicant reached the top 1% of scorers in their first exam (columns 3–4); and whether an applicant was a "top-scorer" in their first exam, defined as an applicant who achieved a rank higher or equal than the number of vacancies notified in the recruitment (columns 5–6). All regressions include baseline exam fixed effects, which controls for category of the Group exam. Even-numbered columns include additional baseline controls, including age, caste, marital status, type of undergraduate degree, whether they completed their high school and undergraduate education in Tamil, and birth district fixed effects. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table 4: Re-application behavior

	Reapplied in ≥ x of 5 years		Reapplied continuously	
	(1) x=1	(2) x=4	(3) 1 year	(4) 5 years
Panel A: All individuals				
Female	0.0293***	-0.0095***	-0.0101***	-0.0114***
	(0.002)	(0.001)	(0.002)	(0.001)
Baseline Rank	Y	Y	Y	Y
N	271936	271936	271936	271936
Male Depvar Mean	0.467	0.104	0.224	0.044
Panel B: Top-quartile of baseline scorers				
Female	0.0209***	-0.0256***	-0.0310***	-0.0276***
	(0.005)	(0.004)	(0.005)	(0.003)
Baseline Rank	Y	Y	Y	Y
N	44613	44613	44613	44613
Male Depvar Mean	0.553	0.182	0.345	0.090
Panel C: Top-quartile of baseline scorers with controls				
Female	0.0347***	-0.0070*	0.0071	-0.0132***
	(0.005)	(0.004)	(0.005)	(0.003)
Baseline Rank	Y	Y	Y	Y
Baseline Controls	Y	Y	Y	Y
N	44613	44613	44613	44613
Male Depvar Mean	0.553	0.182	0.345	0.090

Notes: This table reports gender differences in reapplication behavior among unsuccessful candidates in 2014. Reapplication is measured in two ways: columns 1–2 consider reapplication in *at least* 1 or 4 of 5 years respectively, allowing interruptions between years; columns 3–4 consider reapplication in every year after the initial attempt. Panel A considers all first-time applicants in our preferred sample; Panel B restricts the sample to the top-quartile of baseline scorers, i.e. those who achieved a percentile rank of 75 or higher in their first exam attempt; and Panel C re-runs Panel B including additional baseline controls. All regressions include baseline exam fixed effects. Robust standard errors are in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table 5: Performance gains over time

	Maximum Percentile Rank				Top-scorer			
	All applicants		Top-quartile		All applicants		Top-quartile	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female × Attempt 2	1.732***	1.670***	0.833***	0.507**	0.001***	0.002***	0.006***	0.006***
	(0.112)	(0.123)	(0.219)	(0.230)	(0.000)	(0.000)	(0.001)	(0.002)
Female × Attempt 3	0.640***	0.579***	0.705***	0.673**	-0.008***	-0.009***	-0.034***	-0.034***
	(0.157)	(0.157)	(0.263)	(0.263)	(0.001)	(0.001)	(0.003)	(0.003)
Female × Attempt 4	1.982***	1.901***	1.923***	1.849***	-0.005***	-0.006***	-0.015***	-0.016***
	(0.201)	(0.200)	(0.305)	(0.304)	(0.001)	(0.001)	(0.004)	(0.004)
Female × Attempt 5	1.816***	1.731***	2.036***	1.960***	-0.015***	-0.015***	-0.032***	-0.033***
	(0.263)	(0.260)	(0.329)	(0.329)	(0.002)	(0.002)	(0.007)	(0.007)
Female × Attempt 6	1.956***	1.902***	1.834***	1.845***	-0.001	-0.001	0.005	0.004
	(0.403)	(0.397)	(0.453)	(0.450)	(0.004)	(0.004)	(0.010)	(0.010)
Exam Sequence FE	Y	Y	Y	Y	Y	Y	Y	Y
Baseline Rank	Y	Y	Y	Y	Y	Y	Y	Y
Baseline Controls		Y		Y		Y		Y
N	303044	303044	64490	64490	306848	306848	65732	65732

Notes: This table considers gender differences in performance gains over time. As per equation 3, attempts are measured annually, e.g., attempt 2 considers performance in the second year of attempts by the applicant. Sample is restricted to unsuccessful first-time applicants from 2014. In columns 1–4, the dependent variable is the maximum percentile rank achieved by the applicant in the a-th year of attempts. In columns 5–8, the dependent variable is whether the applicant became a top-scorer in any exam in the a-th year of attempts, where "top-scorer" is defined as an applicant who achieved a rank higher or equal than the number of vacancies notified in the recruitment. Columns 1–2 and columns 5–6 focus on the full sample of our preferred first-time applicant sample, whereas columns 3–4 and 7–8 restrict to the top-quartile of baseline scorers. Regressions control for the baseline percentile rank and even-numbered columns include additional baseline controls. All regressions include fixed effects for the exact sequence of Group exams taken by applicants. Standard errors are clustered at the applicant level. * p<0.10, ** p<0.05, *** p<0.01

Table 6: Gender differences in pre-treatment characteristics of the survey sample

	Single Male (SM)	Single Female (SF)	Married Female (MF)	SM–SF	SM–MF	N
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Personal and household background						
Age	23.60	22.36	26.23	1.25***	-2.63***	3,307
Caste is SC/ST	0.24	0.19	0.16	0.05***	0.08***	3,313
Household income < Rs.20,000	0.84	0.83	0.84	0.02	0.01	3,313
Father's education, ≥10th pass	0.31	0.41	0.37	-0.10***	-0.06***	3,313
Mother's education, ≥10th pass	0.25	0.37	0.28	-0.13***	-0.04**	3,313
Has child	0.00	0.03	0.72	-0.03***	-0.72***	3,313
Has college degree	0.64	0.78	0.79	-0.15***	-0.15***	3,313
Completed 10th in Tamil Board	0.85	0.70	0.79	0.15***	0.06***	3,313
10th grade marks in Tamil Board	370.52	400.21	383.66	-29.69***	-13.14***	2,596
Completed college in Tamil	0.26	0.24	0.23	0.02	0.03	3,313
District: Chennai	0.05	0.09	0.09	-0.04***	-0.04***	3,313
Panel B: Marriage and household support						
Age at first proposal, if any	24.20	20.77	20.95	3.42***	3.24***	1,206
Ideal marriage age (own)	27.47	25.41		2.06***		2,463
Ideal marriage age (parents)	26.84	23.84		3.01***		2,464
Spent money on prep	0.55	0.50	0.58	0.05**	-0.03	3,313
Funding: Own income/savings	0.31	0.23	0.24	0.08***	0.07***	3,313
Funding: Networks	0.26	0.30	0.35	-0.04**	-0.09***	3,313
Network support (Rs.)	4,794.34	3,491.30	2,792.89	1,303.04*	2,001.45***	3,313
Network support, if any (Rs.)	18,413.43	11,805.41	8,042.30	6,608.02***	10,371.13***	971
Stayed outside home for prep	0.15	0.06	0.05	0.09***	0.10***	3,313
Panel C: Information and networks						
Share selected after 3+ attempts	0.54	0.52	0.54	0.02*	0.01	3,313
Knows successful applicant	0.33	0.32	0.35	0.02	-0.02	3,313
Has TNPSC peer support	0.45	0.42	0.43	0.03	0.01	3,313
Panel D: Behavioral factors						
Competition, scale 1-7	5.03	5.27	4.95	-0.24***	0.08	3,313
Risk, scale 0-10	6.29	6.37	5.72	-0.08	0.57***	3,313
Panel E: Employment and outside options						
Employed	0.48	0.24	0.22	0.23***	0.25***	3,313
Employed ever	0.73	0.45	0.60	0.29***	0.14***	3,313
Outside option: No paid work	0.14	0.30	0.44	-0.16***	-0.30***	3,313
Outside option: Income (Rs.)	16,294.42	14,139.05	12,341.80	2,155.37***	3,952.62***	2,430

Notes: This table reports gender differences across pre-treatment variables from the 2022 Candidate Survey. Columns 1–3 present means for single men, single women, and married women, respectively. Columns 4 and 5 show differences between single men and single women/married women. Column 6 reports the number of observations available for each variable across all three groups. Observation counts may vary due to item non-response or sample restrictions. Panel A describes personal and household characteristics. Panel B includes covariates related to marriage and household support. "Age at first proposal" was asked of respondents who were ever married or never married but had received a proposal. Questions on "ideal marriage age" were only asked of never married respondents. "Networks" include family, friends, and other well-wishers. We winsorize the top 1% of values for the amount of funding support received from networks. Panel C reports information and network measures related to TNPSC exams. Panel D contains behavioral indicators. Panel E presents employment and outside option data. For outside options, respondents were asked to report their employment and income if not actively preparing for Group exams. Income is monthly and only reported for those with paid work as their outside option. * p<0.10, ** p<0.05, *** p<0.01

Table 7: Baseline exam performance by baseline marital status

	Percentile rank		Top 1%		Top-scorer	
	(1)	(2)	(3)	(4)	(5)	(6)
Married Female (MF)	4.164***	3.569***	-0.002***	-0.002***	-0.001***	-0.001***
	(0.138)	(0.139)	(0.000)	(0.000)	(0.000)	(0.000)
Single Female (SF)	1.277***	2.029***	-0.002***	-0.001***	-0.001***	-0.001***
	(0.119)	(0.118)	(0.000)	(0.000)	(0.000)	(0.000)
p-value: MF=SF	0.000	0.000	0.203	0.000	0.912	0.478
Baseline Controls		Y		Y		Y
N	262270	262270	262270	262270	262270	262270
Depvar Mean, Single Male	42.491	42.491	0.005	0.005	0.005	0.005

Notes: This table examines gender differences in baseline exam performance across single men, single women, and married women. The sample is the preferred set of first-time applicants, i.e. college graduates under age 30 who do not already have a government job; we exclude married men from this analysis. The dependent variables are as follows: percentile rank in the first exam taken by applicants (columns 1–2); whether an applicant reached the top 1% of scorers in their first exam (columns 3–4); and whether an applicant was a "top-scorer" in their first exam, defined as an applicant who achieved a rank higher or equal than the number of vacancies notified in the recruitment (columns 5–6). All regressions include baseline exam fixed effects, which controls for category of the Group exam. Even-numbered columns include additional baseline controls, including age, caste, type of undergraduate degree, whether they completed their high school and undergraduate education in Tamil, and birth district fixed effects. * p<0.10, ** p<0.05, *** p<0.01

Table 8: Reapplication behavior among top-quartile of scorers by baseline marital status

	Reapplied at least once			Reapplied continuously		
	(1) Any	(2) Multi-stage	(3) Single-stage	(4) Any	(5) Multi-stage	(6) Single-stage
	Panel A: Without controls					
Married Female (MF)	-0.013**	-0.094***	0.014**	-0.047***	-0.018***	-0.005
	(0.006)	(0.006)	(0.006)	(0.003)	(0.002)	(0.004)
Single Female (SF)	0.032***	-0.000	0.039***	-0.020***	-0.020***	-0.008***
	(0.006)	(0.006)	(0.006)	(0.003)	(0.002)	(0.003)
p-value: MF=SF	0.000	0.000	0.000	0.000	0.223	0.300
Baseline Rank	Y	Y	Y	Y	Y	Y
N	43176	43176	43176	43176	43176	43176
Depvar Mean, Single Male	0.559	0.414	0.460	0.093	0.045	0.088
	Panel B: With controls					
Married Female (MF)	0.040***	-0.017***	0.057***	-0.018***	-0.018***	-0.005
	(0.007)	(0.006)	(0.007)	(0.003)	(0.002)	(0.004)
Single Female (SF)	0.030***	0.006	0.036***	-0.016***	-0.020***	-0.008***
	(0.006)	(0.006)	(0.006)	(0.003)	(0.002)	(0.003)
p-value: MF=SF	0.128	0.001	0.001	0.631	0.223	0.300
Baseline Rank	Y	Y	Y	Y	Y	Y
Baseline Controls	Y	Y	Y	Y	Y	Y
N	43176	43176	43176	43176	43176	43176
Depvar Mean, Single Male	0.559	0.414	0.460	0.093	0.045	0.088

Notes: This table reports differences in reapplication behavior by baseline marital status among the top-quartile of baseline scorers. The sample excludes married men and is restricted to unsuccessful applicants in 2014. Panel A controls only for baseline percentile rank, while Panel B includes additional baseline applicant characteristics. Columns 1–3 report whether individuals reapplied at least once during the five-year follow-up; columns 4–6 report whether they reapplied continuously during the same period. The dependent variables in columns 1 and 4 reflect reapplication to any exam; columns 2 and 5 focus on multi-stage exams; and columns 3 and 6 on single-stage exams. All regressions include baseline exam fixed effects. Robust standard errors are in parentheses.
* $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table 9: Treatment effects on number of exam attempts

	# Attempts		
	(1) Single Male	(2) Single Female	(3) Married Female
	Panel A: Without controls		
Info	-0.36	-0.99***	0.17
	(0.23)	(0.27)	(0.31)
Info × HH prime	-0.20	0.64*	-1.01**
	(0.34)	(0.38)	(0.45)
HH prime	0.22	-0.26	0.83***
	(0.25)	(0.26)	(0.32)
N	1398	1126	789
Control Mean	6.17	6.86	6.48
	Panel B: With controls		
Info	-0.29	-0.85***	0.17
	(0.23)	(0.27)	(0.32)
Info × HH prime	-0.26	0.45	-1.04**
	(0.34)	(0.38)	(0.45)
HH prime	0.26	-0.24	0.82***
	(0.25)	(0.26)	(0.32)
N	1395	1123	789
Control Mean	6.17	6.86	6.48

Notes: This table considers treatment effects on the (hypothetical) number of attempts candidates are willing to make. Columns 1–3 consider treatment effects on subgroups of single men, single women, and married women, respectively. Panel A reports effects without any controls, whereas Panel B controls for prior belief about difficulty of success, age, college completion, 10th grade exam performance, board exam type, caste, number of siblings, household income, and whether parents had less than a 10th grade education. The outcome is top-coded at a maximum of 10 attempts. Regressions include exam strata fixed effects. Robust standard errors are shown in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

ONLINE APPENDIX

Gender Dynamics in Entry into Competitive Careers: Evidence from Indian Civil Services

Kunal Mangal
Niharika Singh

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A Additional Details on Context

A.1 Variation in attributes of Group exams

The table below provides a summary of attributes by type of Group exam during our sample period from 2012 to 2019.

Attribute	Group 1	Group 2	Group 2A	Group 4
Minimum age required	21	21	21	18
Minimum education required	College	College	College	10th pass
Exam stages	Multiple	Multiple	Single	Single

The table below shows job titles listed in a sample of Group exam notifications from 2014-15.

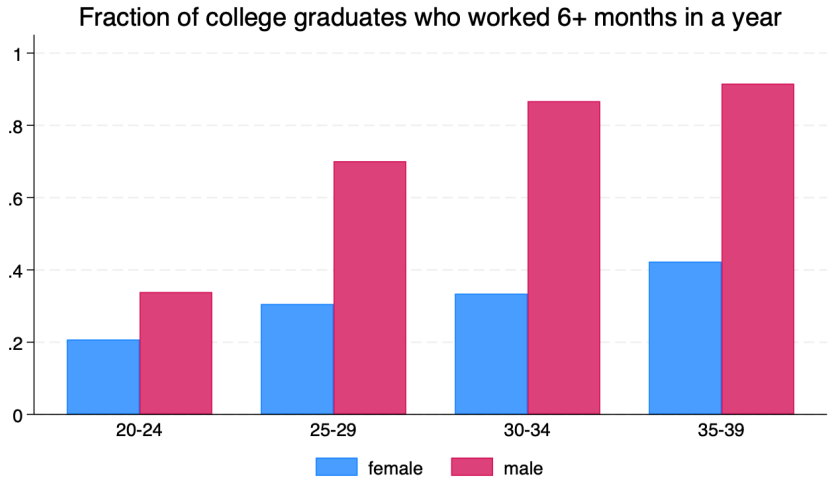
Group	Job titles
1	Deputy Collector
	Deputy Superintendent of Police
	Assistant Commissioner
	District Registrar
2	Deputy Commercial Tax Officer;
	Sub Registrar, Grade-II
	Probation Officer
	Assistant Inspector of Labor
	Junior Employment Officer
	Special Assistant
	Assistant Section Officer
	Special Branch Assistant
	Assistant Section Officer cum Programmer
	Assistant Inspector
	Audit Inspector
	Executive Officer, Grade-II
	Revenue Assistant
	Handloom Inspector
	"Supervisor / Junior Superintendent"
	Senior Inspector
	Supervisor of Industrial Co-operatives
2A	Personal Clerk
	Assistant
	Planning Junior Assistant
	Lower Division Clerk
	Junior Co-operative Auditor
4	Village Administrative Officer
	Junior Assistant
	Bill Collector, Grade-I
	Typist
	Steno-Typist, Grade - III
	Field Surveyor
	Draftsman

A.2 Administrative data coverage

notification no.	exam year	exam type	registration	exam scores	placement
2012-14	2012	G4	x	x	
2012-26	2012	G4V	x	x	
2012-49	2013	G1	x		
2013-09	2013	G4	x	x	x
2013-14	2013	G2	x	x	x
2013-17	2014	G1	x	x	x
2014-01	2014	G2A	x	x	x
2014-07	2014	G4V	x	x	x
2014-18	2014	G4	x	x	x
2015-07	2015	G2	x	x	x
2015-09	2015	G1	x	x	x
2015-17	2016	G2A	x	x	x
2015-19	2016	G4V	x	x	x
2016-15	2016	G4	x	x	x
2016-19	2017	G1	x	x†	x
2017-10	2017	G2A	x	x	x
2017-23	2018	G4/G4V	x	x	x
2018-15	2018	G2	x	x	x
2019-01	2019	G1	x	x	x
2019-19	2019	G4/G4V	x	x	x

Notes: This table documents what we observe in the administrative data for each of stage of the recruitment process for Group level exams notified from 2012 to 2019. "Exam year" denotes the year that the first stage (or the only stage) of the recruitment is conducted.
† For this recruitment, we do not observe the test score for the first stage of the exam, but know who appeared for the first stage exam.

A.3 Employment rates by age and sex for college graduates



Notes: This figure shows the fraction of college graduates in Tamil Nadu that worked for at least 6 months in the previous year by age bins and sex. Data come from the 2011 Census.

A.4 Selected quotes from qualitative sources

In this appendix, we provide selected quotes from (i) focus group interviews we conducted in February 2022 with female applicants to understand their participation in the TNPSC group exams and (ii) news reports and other internet sources. Our focus groups were conducted in Tamil and these quotes are translated and have been lightly edited for comprehension.

A) Marriage pressure:

Quotes 1-4 are from female focus group participants in Tamil Nadu. Quotes 5-6 are quotes from a Reddit thread from September 1, 2024 on the UPSC exams, showing that these pressures are not unique to TNPSC exams.[1]

(1) "One friend shared with me that in order to avoid marriage proposal, she shaved her head fully suddenly without informing anyone, and thus the marriage was postponed."

(2) "I told my family to wait for another 1 year [for my marriage], but they did not want to saying that only after my marriage my elder and younger brother can get married so you have to marry soon. So I accepted to get married."

(3) "The marriage proposals have started and I could not avoid them. . . I want to study, and will tell my parents.. I tell them once my career is settled then whoever you ask me to marry, I will marry."

(4) "I am 23 now. Even if parents are ok, relatives are asking about getting me married. In fact girls younger than me have already gotten married. [...] if I had been a guy maybe I would have gotten an extra 4 to 5 years time."

(5) "Shaadi [trans. Marriage] ka added pressure – Hello all, I am 28(F), I will be giving my 2nd attempt next year, I am studying of course. But I am damn scared about, what if I am not successful. To add to that, my parents keep telling me, I am late in marriage market and good guys won't be available."

(6) "I'm 24 and my parents are after my life to get some govt job [by] 2026 max because they won't delay my marriage after 26 at any damn cost!"

B) Household chores and familial expectations after marriage

(1) "In my in-laws house, they ask me to study after finishing all my work."

(2) "[At our in-laws,] we can not expect support like parents. If I study in my parents' house, they allow me to study fully, i.e., from morning to till evening I sit in a place and they do not disturb me. I cannot be like [that] in my in-laws house, they expect to do their work first. We can not sit in one place for hours together. They support but not like parents support us."

(3) "Generally in-laws never say that we should not study. But they are concerned about family work first then only support our studies. It is difficult to clear exams

[1] Link here: https://www.reddit.com/r/UPSC/comments/1f6gyjs/shaadi_ka_added_pressure/ (Retrived September 2, 2024).

with all these disturbances."

(4) "Even if we have a condition [before marriage] that the groom's family should be supportive of education and stress it repeatedly, after getting [married] it won't be the same. [...] it will be just words, like words written in water. They will say you first finish the cooking and other works and then you can do your work."

C) Labor market options: Public vs private sector jobs

(1) "If I continue my private job even after my marriage, it won't [make] much difference for my in-laws. But if I get a govt job, they can't force me to leave or quit my job; hopefully no one will say that."

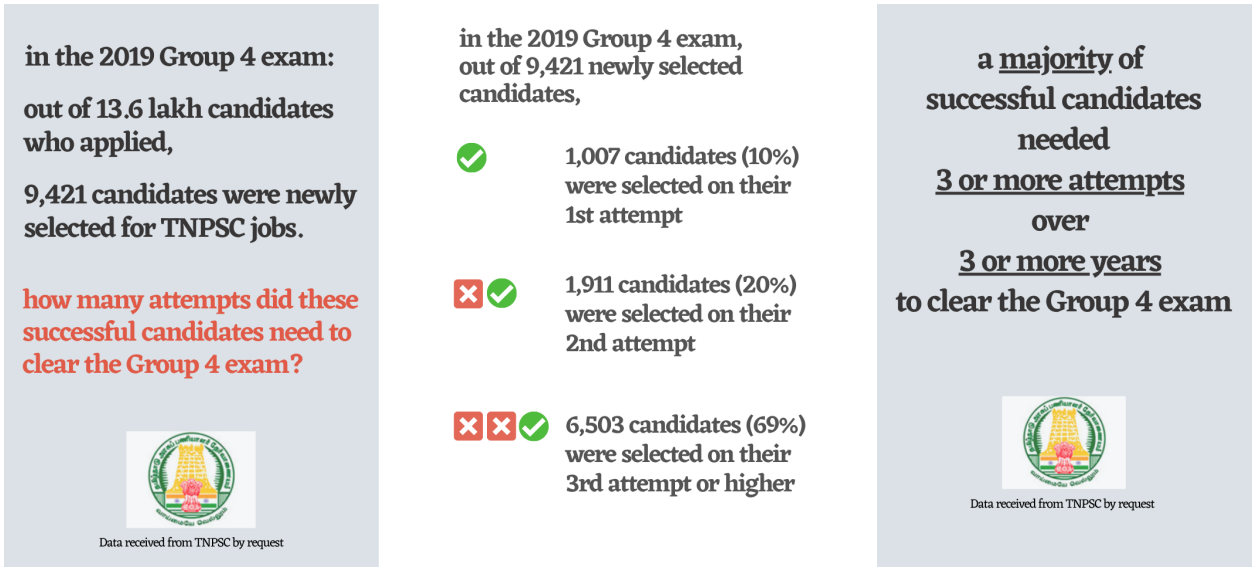
(2) "If we are in a govt job, then [in-laws] will only say it's ok, it's ok, she has a gov't job and has a financial stability and will adjust. In case I'm in a private job then definitely within 2 minutes they will ask me to leave the job and tell that family is important, family is our god."

(3) "I got selected for a private job in campus interview in my college which had 3 shifts including night shifts. So because of that parents were not willing to send me to work. But in the case of govt job, it's not like that. We only have to work in the morning and there is safety. We can also return from work and take care of the kids and family."

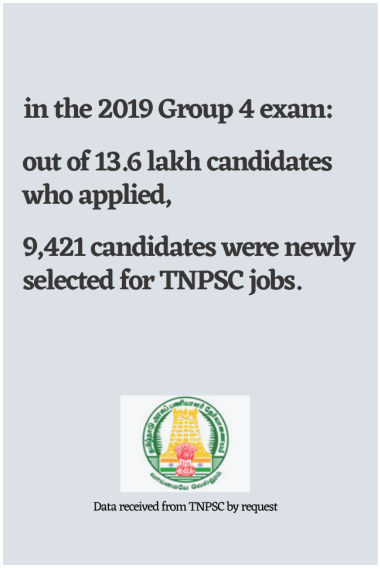
B Experimental Details

B.1 Visuals

(a) Information treatment



(b) Control



Notes: This figure shows visuals used in the experiment in the applicant survey.

B.2 'Household Prime' module

The following questions were randomly delivered to 50% of respondents, both men and women. They were shown prior to the delivery of the treatment or the placebo infomration. We altered the questions slightly depending on the marital status of the respondent.

For never married respondents:

1. You told us earlier your ideal marriage age is [response], while your parents' ideal marriage age for you is [response]. By what age are most [men/women] from your social and economic background married?
2. Do you think you will have any say in choosing your spouse?
    - I will have no choice, my parents/relatives will choose for me
    - My parents/relatives will choose, but I can reject or say no to someone
    - I will choose, but my parents/relatives will need to approve
    - My parents will support me, no matter who I choose to marry
3. Once you are married, how many hours per day do you think you would spend on household chores (e.g. paying bills, taking care of children or relatives, going to the market, cooking, and cleaning)?
4. Suppose you are not selected for TNPSC before marriage. If you want to study for TNPSC exams after marriage, how many hours do you think you will be able to study uninterrupted per day?
5. Do you think for someone like yourself it is easier to prepare for TNPSC Group exams before marriage or after marriage? Response options = [Before marriage; After marriage; Marriage does not make a difference]

For married/divorced/widowed respondents:

1. You told us earlier you were married at age [response]. By what age are most men/women from your social and economic background married?
2. Did you have any say in choosing your spouse?
    - I had no choice, my parents/relative chose for me
    - My parents/relatives chose, but I had say in the choice
    - I chose, but my parents/relatives had to approve
    - I had complete choice, and my parents supported me
3. How many hours per day do you spend on household chores (e.g. paying bills, taking care of children or relatives, going to the market, cooking, and cleaning)?
4. How many hours are you able to study uninterrupted per day for your TNPSC exam preparation?
5. Do you think it is easier to prepare for TNPSC Group exams before marriage or after marriage? Response options = [Before marriage; After marriage; Marriage does not make a difference]

C Additional Figures and Tables

C.1 Summary statistics: Applicants in 2019

	(1) All applicants	(2) Successful applicants
Age	25.988	27.525
Age at first attempt	23.729	23.867
Female	0.558	0.525
Married	0.302	0.304
Caste is SCST	0.272	0.202
SSC completed in Tamil	0.747	0.852
Has college degree	0.567	0.894
# years with exam attempts	1.742	3.246
No previous exam attempts	0.35	0.068
Initial percentile rank	45.821	74.306

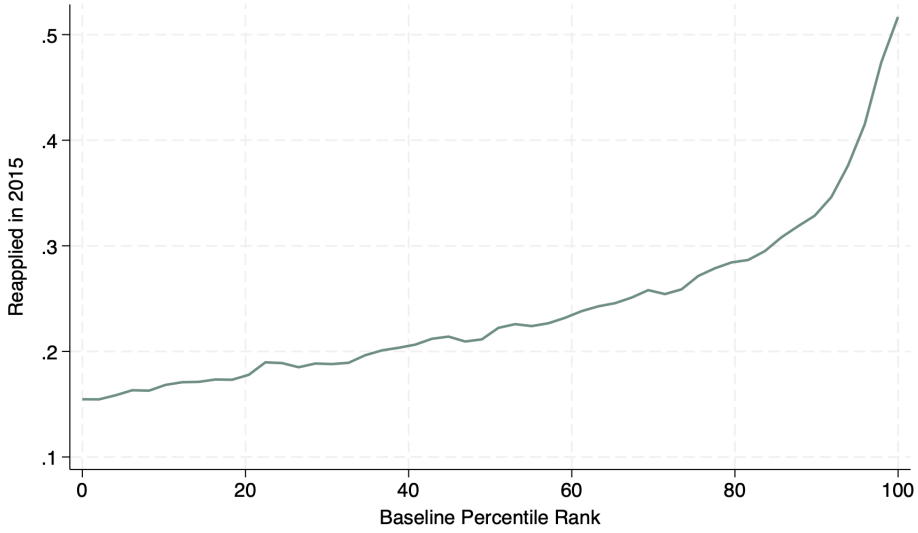
Notes: This table shows the average characteristics of applicants from the 2019 Group exams. Column 1 considers all applicants, whereas column 2 restricts to the sample of successful applicants in 2019. "Initial percentile rank" is the rank achieved by the applicant in the earliest exam score visible in our data.

C.2 Summary statistics by marital status in administrative data

	Single Male (SM)	Single Female (SF)	Married Female (MF)	Diff: SM–SF	Diff: SM–MF	N
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All applicants in 2019						
Age	24.54	22.76	30.27	1.77***	-5.73***	1,414,524
Caste is SC/ST	0.28	0.26	0.24	0.02***	0.04***	1,414,525
Birth district: Chennai	0.03	0.03	0.03	-0.00***	0.00***	1,414,525
Has college degree	0.50	0.53	0.69	-0.03***	-0.19***	1,414,525
Completed 10th in Tamil	0.70	0.69	0.86	0.02***	-0.16***	1,414,525
Completed 12th in Tamil	0.59	0.54	0.69	0.05***	-0.10***	155,770
Completed college in Tamil	0.07	0.05	0.12	0.02***	-0.05***	152,065
UG degree: Arts	0.19	0.24	0.36	-0.05***	-0.17***	792,153
UG degree: Sciences	0.29	0.43	0.38	-0.14***	-0.08***	792,153
UG degree: Commerce	0.11	0.11	0.14	0.01***	-0.02***	792,153
UG degree: Engineering	0.39	0.21	0.11	0.18***	0.28***	792,153
UG degree: Other	0.01	0.01	0.01	0.00***	-0.00***	792,153
Panel B: Preferred first-time applicant sample						
Age	24.15	23.08	25.82	1.08***	-1.66***	262,270
Caste: SC/ST	0.22	0.21	0.16	0.01***	0.06***	262,270
Birth district: Chennai	0.04	0.04	0.04	0.00	0.00*	262,270
Completed 10th in Tamil	0.74	0.77	0.81	-0.03***	-0.07***	262,270
Completed 12th in Tamil	0.74	0.76	0.81	-0.01***	-0.06***	255,848
Completed college in Tamil	0.10	0.12	0.21	-0.02***	-0.11***	261,711
UG degree: Arts	0.12	0.19	0.27	-0.07***	-0.15***	262,270
UG degree: Sciences	0.34	0.46	0.45	-0.12***	-0.10***	262,270
UG degree: Commerce	0.22	0.20	0.21	0.03***	0.01***	262,270
UG degree: Engineering	0.30	0.15	0.06	0.15***	0.24***	262,270
UG degree: Other	0.02	0.01	0.02	0.00***	0.00	262,270

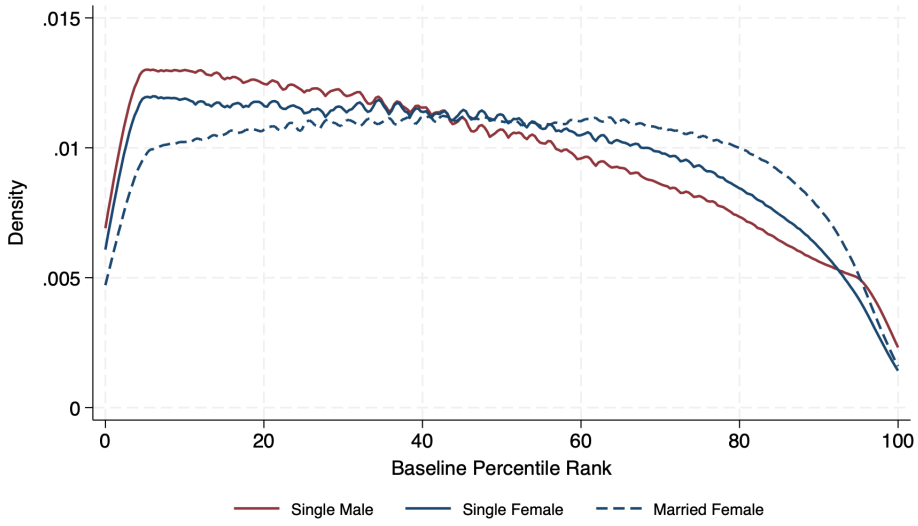
Notes: This table reports differences across observable characteristics for single men, single women, and married women for different samples from the administrative data. Panel A considers all applicants who appeared for a Group exam in 2019. Panel B restricts to the preferred first-time applicant sample from 2014: first-time applicants who are college graduates under age 30 and do not hold a government job. Columns 1–3 present means for the three subgroups. Columns 4 and 5 show differences between single men and single women/married women, respectively. Column 6 reports the number of observations available for each variable across all three groups. Observation counts may vary due to missing data. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

C.3 Reapplication in 2015



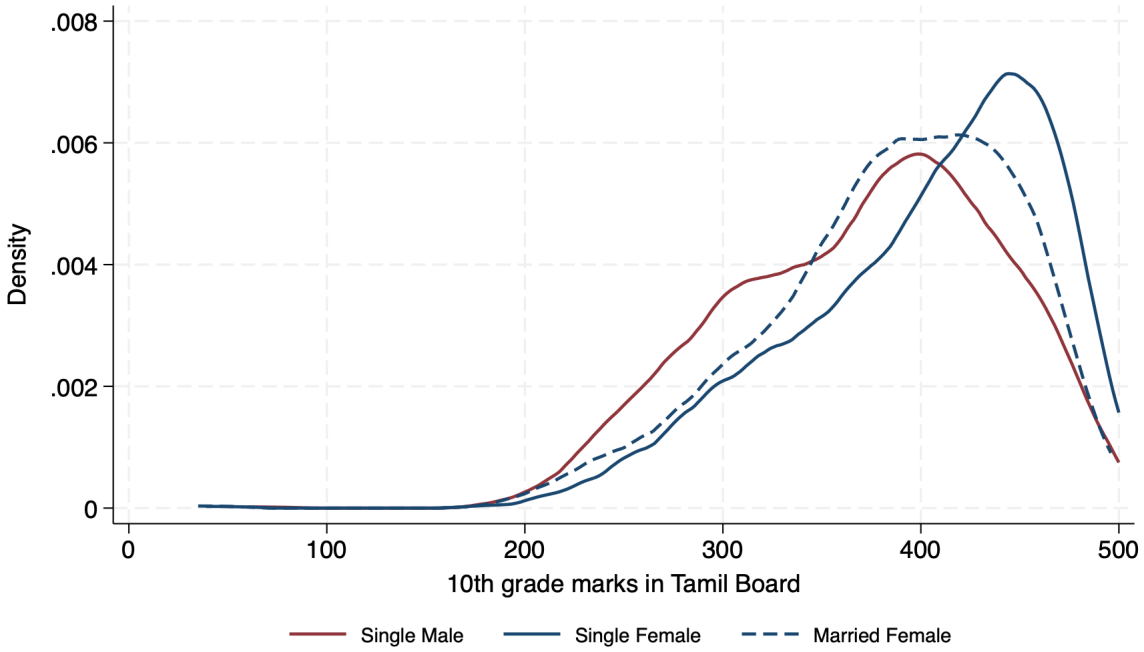
Notes: This figure plots non-parametric estimates of reapplication rates among unsuccessful first-time applicants from 2014. The y-axis shows the fraction reapplying to any Group exam in 2015. The x-axis shows candidates' percentile rank in their first attempt in 2014.

C.4 Baseline exam performance by marital status for first-time applicants



Notes: This figure shows gender differences in baseline exam performance among single men, single women, and married women. Sample is first-time applicants who are college graduates, under the age of 30, and do not already hold a government job. The "baseline" exam refers to candidates' first exam in 2014. Marital status is also measured at baseline.

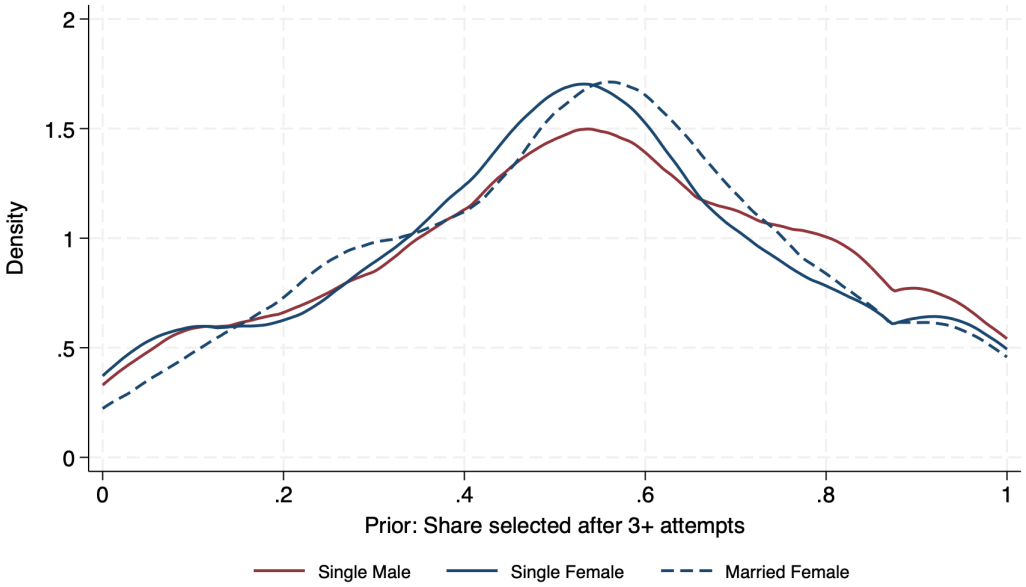
C.5 Distribution of 10th grade exam score by marital status: Survey sample



Notes: This figure show the distribution of 10th grade exam scores by marital status in the Candidate Survey sample. Sample is restricted to individuals who report studying in the Tamil Board for comparability (78% of survey sample).

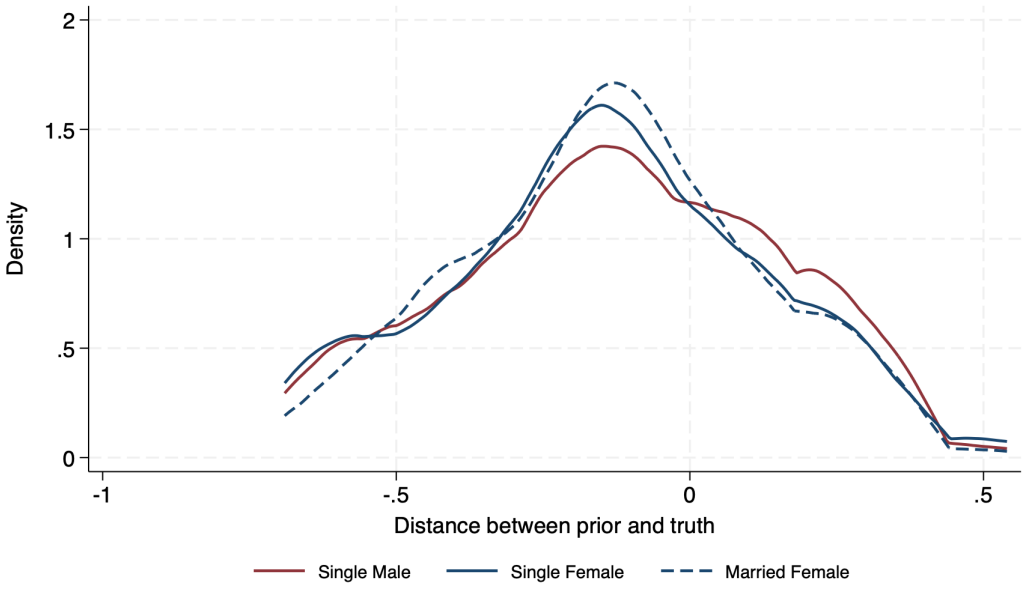
C.6 Beliefs in the information experiment

Figure C.3.1: Distribution of priors



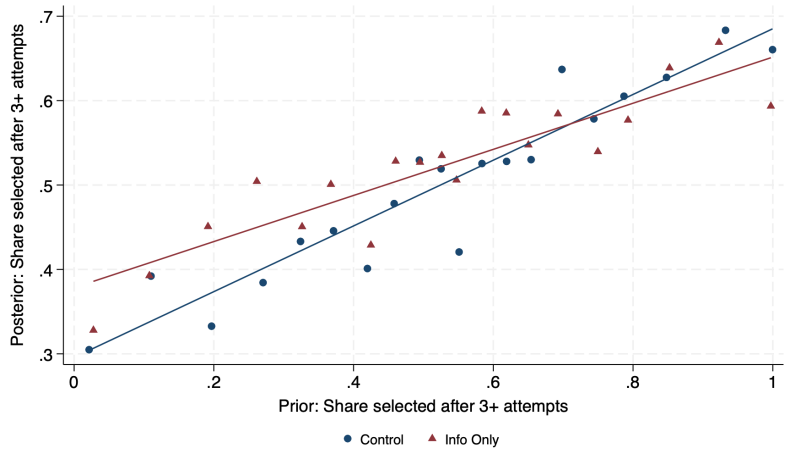
Notes: The figure shows the distribution of priors for the share of successful candidates with at least three attempts separately for single men, single women, and married women.

Figure C.3.2: Distance between prior and truth regarding difficulty of success

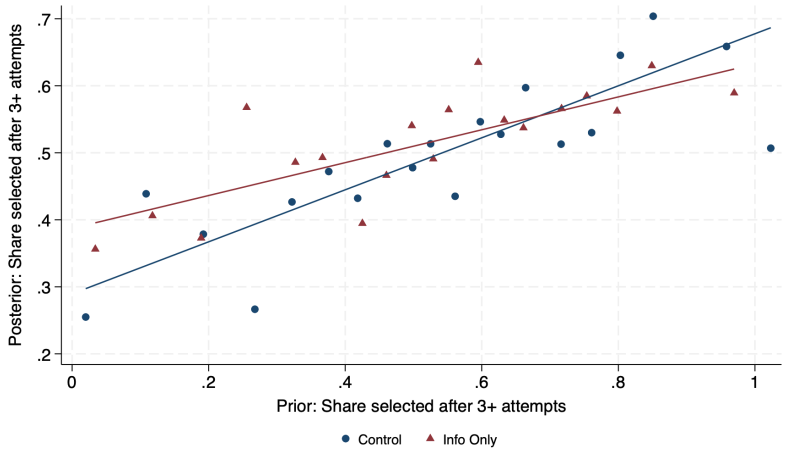


Notes: The figure shows the difference between priors and truth about the difficulty of success in Group exams. Respondents were asked to estimate the fraction of successful candidates who made three or more attempts in the previous Group exam. The true value is computed using the administrative data. Values greater than 0 mean that the respondent overestimated the difficulty of success and less than 0 mean that they underestimated the difficulty of success.

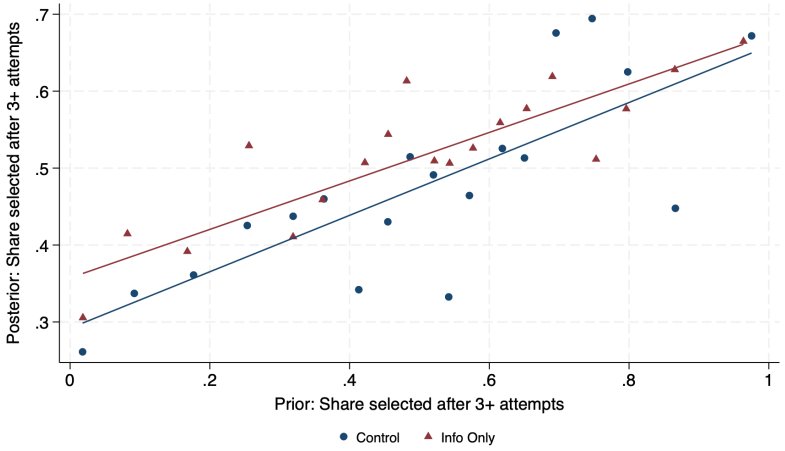
Figure C.3.3: Belief updating for information treatment



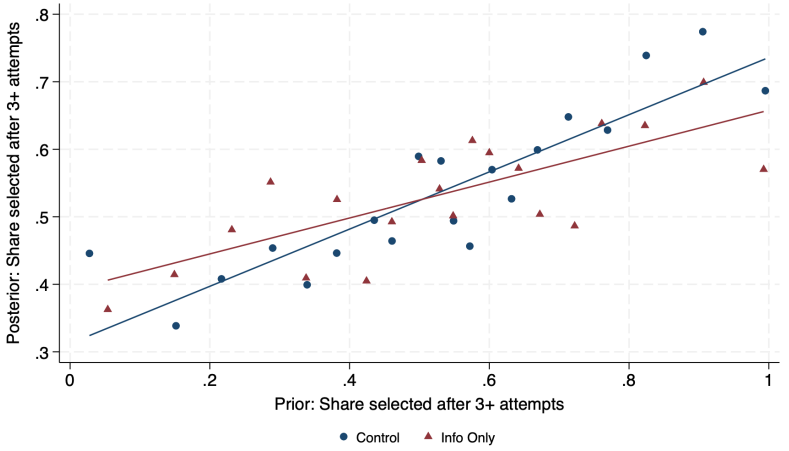
(a) All



(b) Single Male



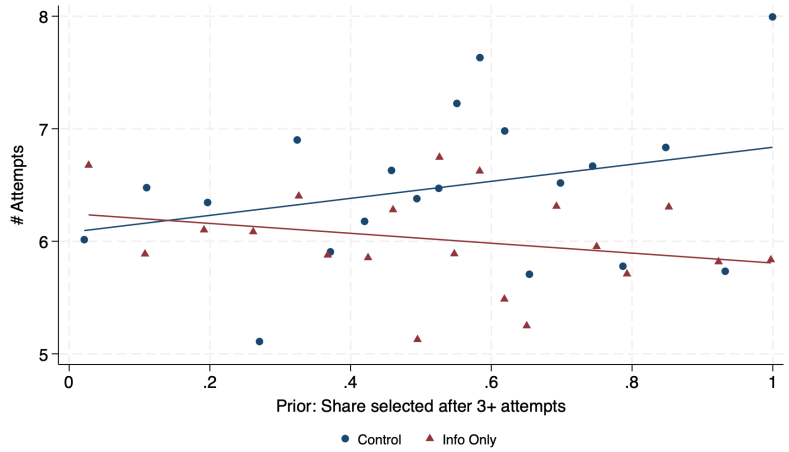
(c) Single Female



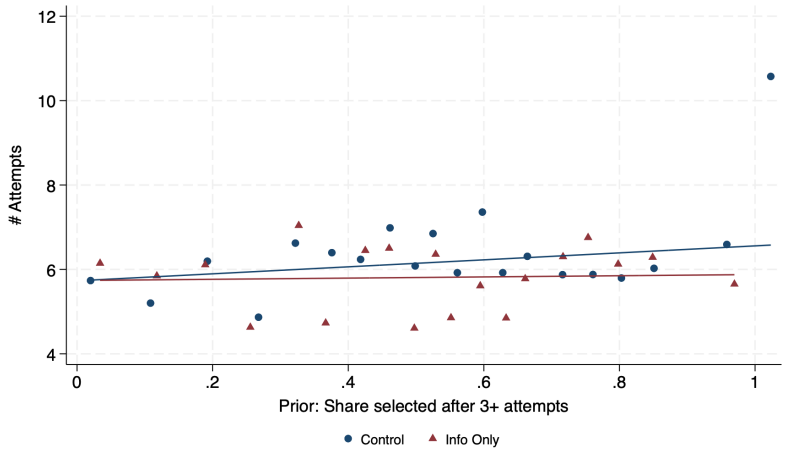
(d) Married Female

Notes: This figure shows treatment effects on beliefs about the difficulty of success, controlling for the exam strata. The x-axis is the prior belief about the share of successful candidates who made 3+ attempts in the previous exam; the y-axis is the posterior belief about the same for an upcoming exam. Sample is restricted to control and those assigned to the information treatment only. Panel (a) reports estimates for all candidates; panels (b)-(d) restrict to single men, single women, and married women, respectively.

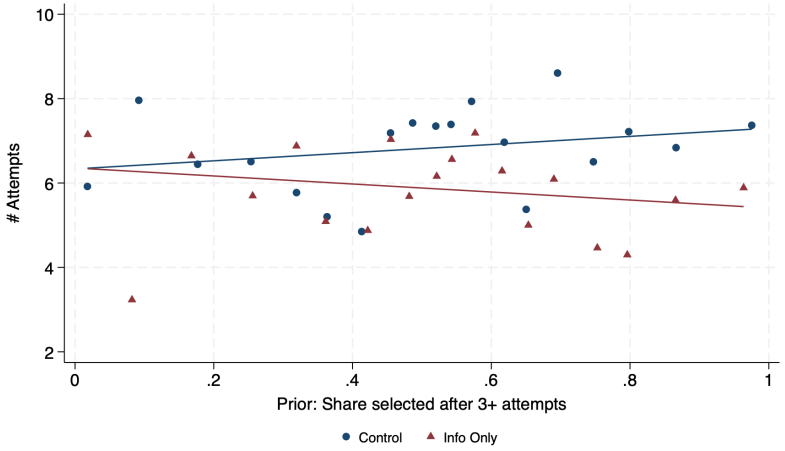
Figure C.3.4: Treatment effects on attempts by prior beliefs



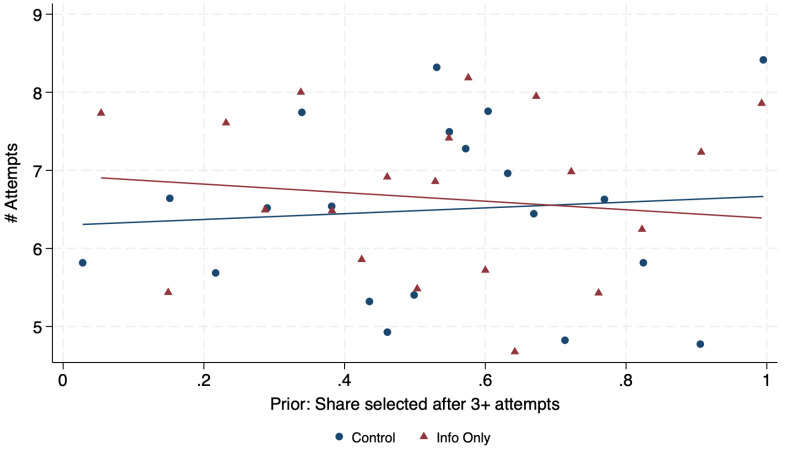
(a) All



(b) Single Male



(c) Single Female

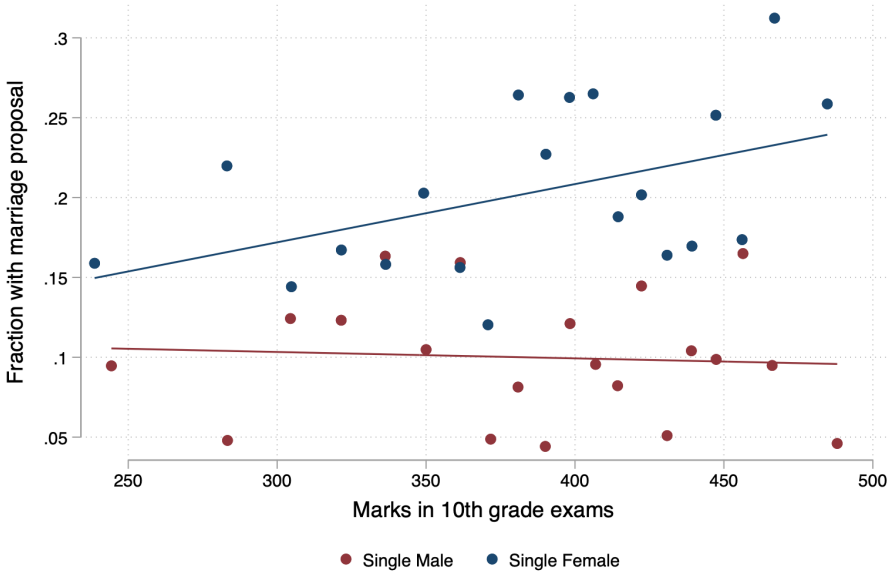


(d) Married Female

Notes: This figure shows treatment effects on the number of attempts candidates are willing to make, controlling for the exam strata. The x-axis is the prior belief about the share of successful candidates who made 3+ attempts in the previous exam. Sample is restricted to control and those assigned to the information treatment only. Panel (a) reports estimates for all candidates; panels (b)-(d) restrict to single men, single women, and married women, respectively.

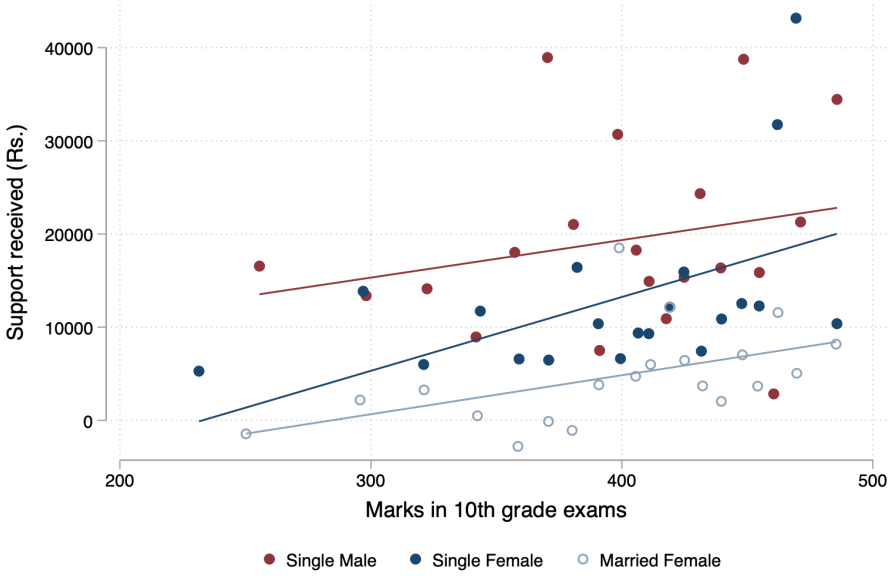
C.7 Survey correlations with 10th grade exam performance

Figure A.7.1: Marriage market exposure and 10th grade scores



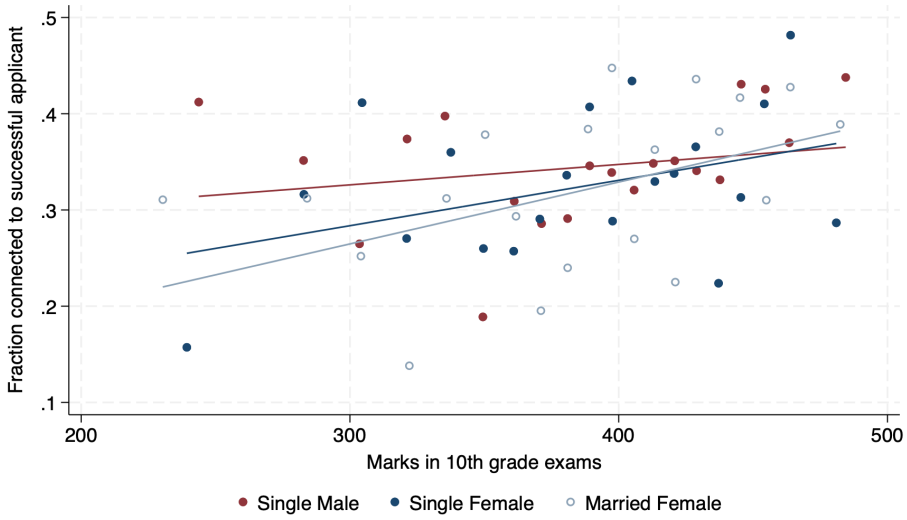
Notes: This figure shows a binned scatterplot of the fraction of never married individuals that had received a marriage proposal at the time of the applicant survey by their 10th grade exam scores, controlling for age, board exam type, and college completion.

Figure A.7.2: Funding support for TNPSC preparation and 10th grade scores



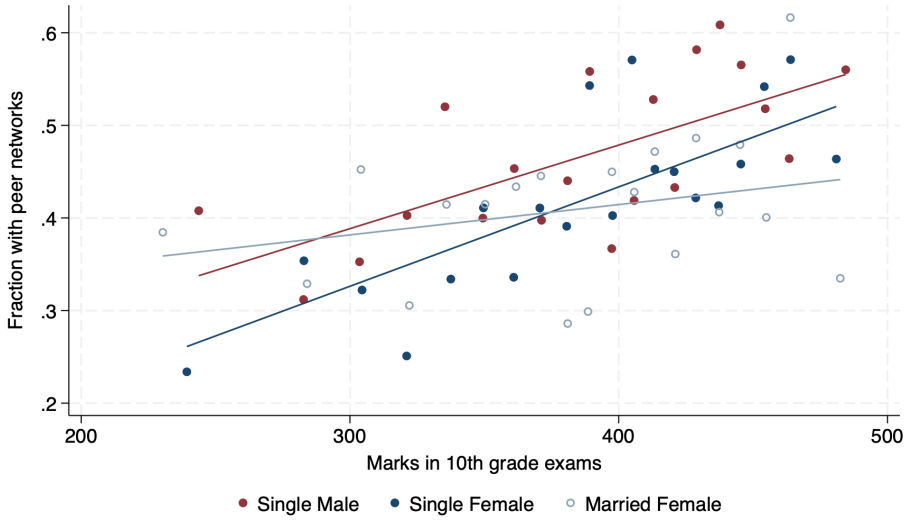
Notes: This figure shows a binned scatterplot of the monetary support received by candidates from friends and family for exam preparation by their 10th grade exam scores, controlling for age, board exam type, and college completion.

Figure A.7.3: Personal connection with successful candidate and 10th grade scores



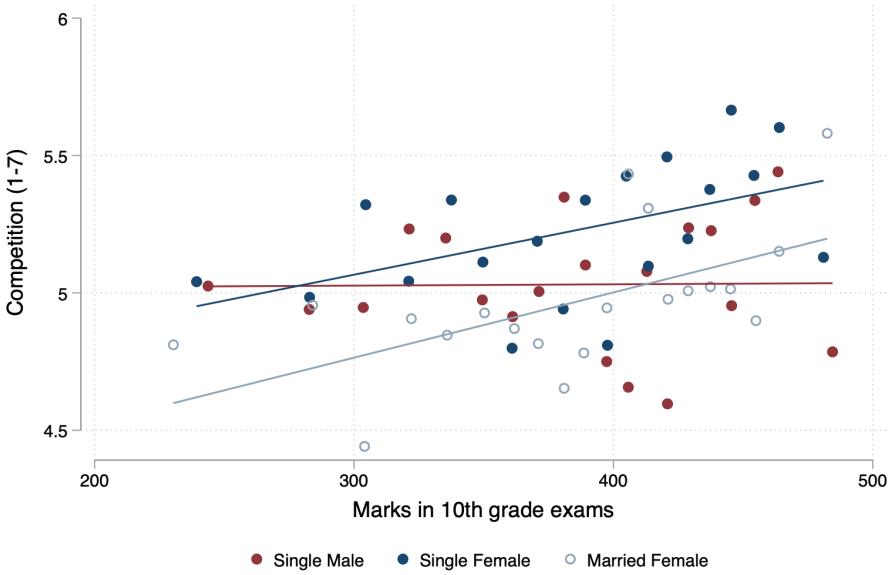
Notes: This figure shows a binned scatterplot of applicants' connectedness with a successful candidate by their 10th-grade exam scores, controlling for age, board exam type, and college completion.

Figure A.7.4: Peer networks and 10th grade scores



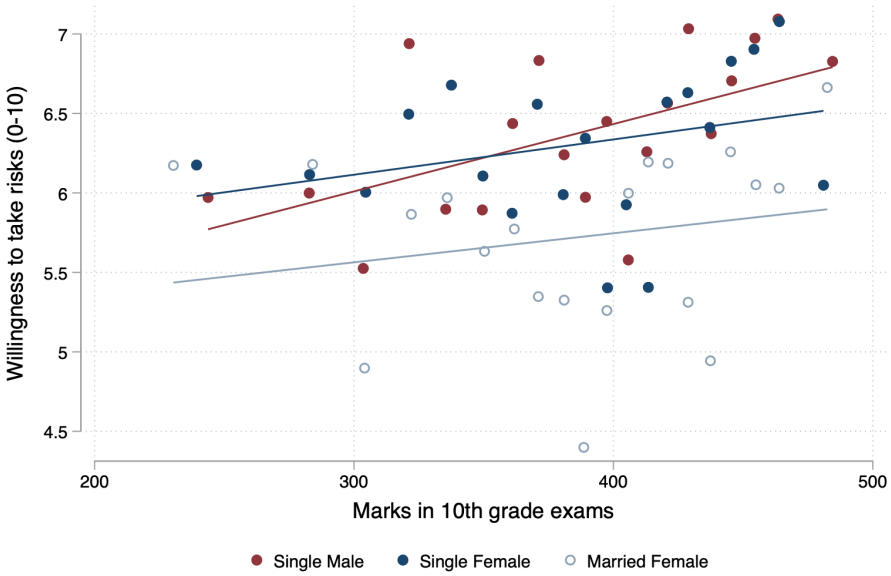
Notes: This figure shows a binned scatterplot of applicants' access to peer support networks by 10th-grade exam scores, controlling for age, board exam type, and college completion. Specifically, w asked respondents the number of other candidates they know who can support them, including answering questions, sharing study materials, or providing motivation.

Figure A.7.5: Competition and 10th grade scores



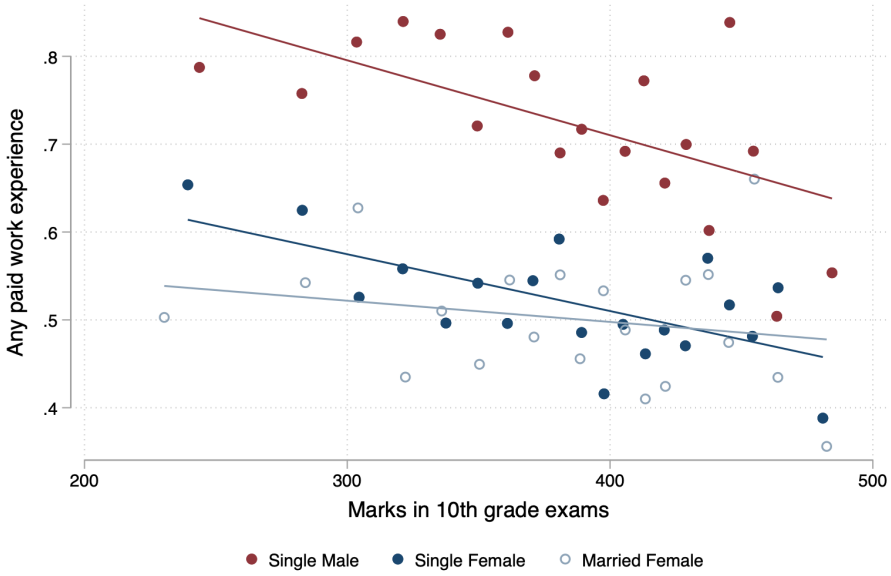
Notes: This figure shows a binned scatterplot of applicants' willingness to compete by their 10th-grade exam scores, controlling for age, board exam type, and college completion. Willingness to compete is measured on a 7-point scale based on agreement with the statement: "Competition brings out the best in me."

Figure A.7.6: Risk and 10th grade scores



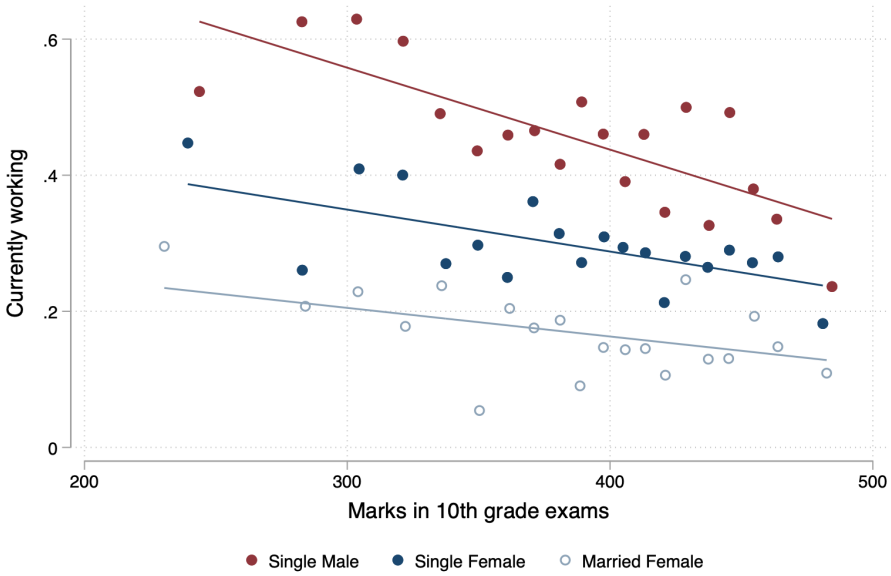
Notes: This figure shows a binned scatterplot of applicants' willingess to take risks by 10th-grade exam scores, controlling for age, board exam type, and college completion. We asked respondents to report how willing or unwilling they are to take a risky decision on an 11-point scale.

Figure A.7.7: Any paid work experience and 10th grade scores



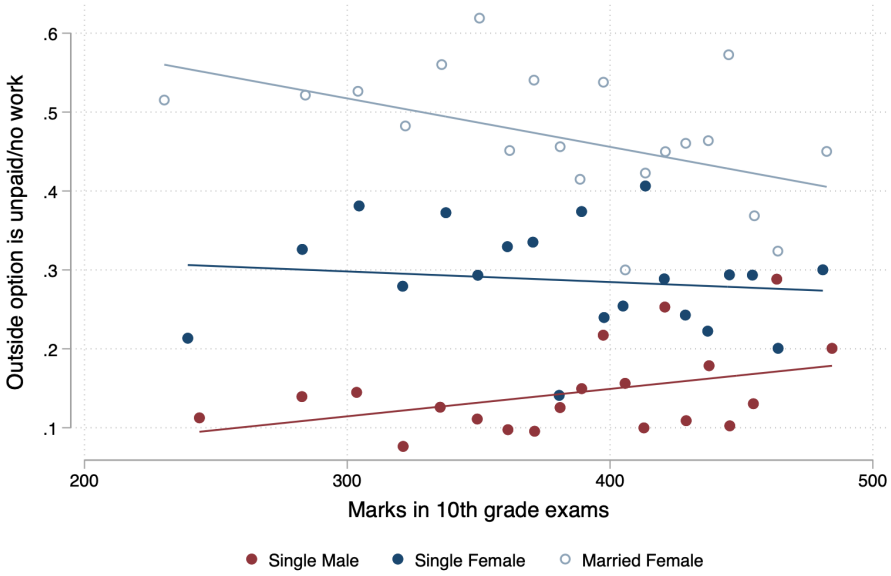
Notes: This figure shows a binned scatterplot of the fraction of respondents who have any paid work experience by their 10th grade exam scores, controlling for age, board exam type, and college completion.

Figure A.7.8: Probability of current employment and 10th grade scores



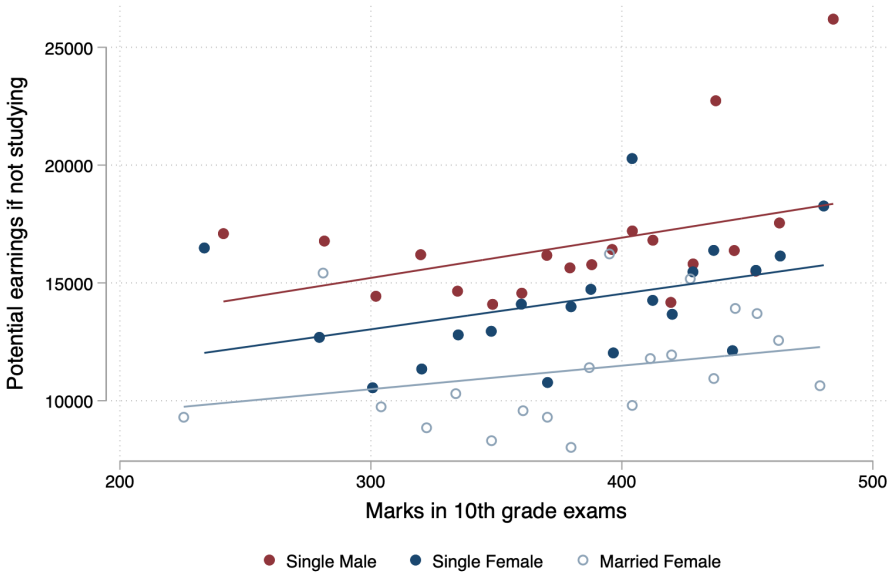
Notes: This figure shows a binned scatterplot of the fraction of respondents who are working at the time of the survey by their 10th grade exam score, controlling for age, board exam type, and college completion.

Figure A.7.9: Outside option of no paid work and 10th grade scores



Notes: This figure shows a binned scatterplot of the fraction of respondents saying their outside option is unpaid work (or no work) by their 10th grade exam scores, controlling for age, board exam type, and college completion.

Figure A.7.10: Potential earnings and 10th grade scores



Notes: This figure shows a binned scatterplot of the potential earnings reported by survey respondents (if they were not studying) by their 10th grade exam scores, controlling for age, board exam type, and college completion.

C.8 Alternative sample: Younger than 24 years of age

	Baseline Performance		Reapplication	
	(1) Pctl Rank	(2) Top-scorer	(3) At least once	(4) For 5 years
Panel A: All individuals				
Female	1.6433***	-0.0007***	0.0308***	-0.0093***
	(0.147)	(0.000)	(0.003)	(0.001)
Baseline Rank			Y	Y
Baseline Controls	Y	Y	Y	Y
N	136562	136562	136349	136349
Male Depvar Mean	42.491	0.002	0.501	0.055
Panel B: Top-quartile of baseline scorers				
Female			0.0207***	-0.0150***
			(0.008)	(0.005)
Baseline Rank			Y	Y
Baseline Controls			Y	Y
N			20029	20029
Male Depvar Mean			0.595	0.110

Notes: This table reports gender differences in baseline performance and reapplication after further restricting the preferred sample to under age 24. That is, the sample in this table is a cohort of 2014 applicants who did not appear in any exams in 2012 and 2013, hold a college degree, and are under 24 years of age. Columns 1–2 consider measures of baseline performance. Columns 3–4 consider reapplication behavior among unsuccessful applicants from 2014: whether individuals reapplied at least once and whether they reapplied continuously for five years. Panel A includes all individuals. Panel B restricts to the top-quartile of baseline scorers, i.e. those who achieved a percentile rank of 75 or higher in the first exam attempt. All regressions include baseline exam type fixed effects and control for the usual set of baseline characteristics. Columns 3–4 additionally control for the baseline percentile rank. Robust standard errors are in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

C.9 Alternative sample: No age or education restrictions

	Baseline Performance		Reapplication	
	(1) Pctl Rank	(2) Top-scorer	(3) At least once	(4) For 5 years
Panel A: All individuals				
Female	2.7373***	-0.0003***	0.0343***	-0.0007**
	(0.060)	(0.000)	(0.001)	(0.000)
Baseline Rank			Y	Y
Baseline Controls	Y	Y	Y	Y
N	827180	827180	825951	825951
Male Depvar Mean	37.106	0.001	0.389	0.019
Panel B: Top-quartile of baseline scorers				
Female			0.0397***	-0.0057***
			(0.003)	(0.001)
Baseline Rank			Y	Y
Baseline Controls			Y	Y
N			105059	105059
Male Depvar Mean			0.501	0.055

Notes: This table reports gender differences in baseline performance and reapplication for first-time applicants without any age or education restrictions. That is, the sample in this table is a cohort of 2014 applicants who did not appear in any exams in 2012 and 2013 and who do not already hold a government job. Columns 1–2 consider measures of baseline performance. Columns 3–4 consider reapplication behavior among unsuccessful applicants from 2014: whether individuals reapplied at least once and whether they reapplied continuously for five years. Panel A includes all individuals. Panel B restricts to the top-quartile of baseline scorers, i.e. those who achieved a percentile rank of 75 or higher in the first exam attempt. All regressions include baseline exam type fixed effects, the core baseline characteristics, and respondents' education level. Degree type is coded as 0 for those who do not have a college degree. Columns 3–4 additionally control for the baseline percentile rank. Robust standard errors are in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

C.10 Alternative sample: One-year look-back period

	Baseline Performance		Reapplied in ≥ x of 6 years		Reapplied continuously	
	(1) Pctl Rank	(2) Top-scorer	(3) x=1	(4) x=5	(5) 5 years	(6) 6 years
Panel A: All individuals						
Female	3.9055***	-0.0005***	0.0171***	-0.0067***	-0.0096***	-0.0096***
	(0.088)	(0.000)	(0.002)	(0.001)	(0.001)	(0.001)
Baseline Rank			Y	Y	Y	Y
Baseline Controls			Y	Y	Y	Y
N	430954	430954	429849	429849	429849	429849
Male Depvar Mean	45.899	0.003	0.592	0.104	0.070	0.048
Panel B: Top-quartile of baseline scorers						
Female			-0.0004	-0.0245***	-0.0273***	-0.0232***
			(0.003)	(0.003)	(0.002)	(0.002)
Baseline Rank			Y	Y	Y	Y
Baseline Controls			Y	Y	Y	Y
N			96350	96350	96350	96350
Male Depvar Mean			0.670	0.166	0.121	0.087

Notes: This table reports gender differences in baseline performance and reapplication for a modified definition of first-time applicants. Under this modified definition, we only consider a one-year look-back period; that is, first-time applicants are now a cohort of 2013 applicants who did not appear in any exams notified in 2012. Sample remains restricted to college graduates under the age of 30 who do not already have a government job. Columns 1–2 consider measures of baseline performance, whereas columns 3–6 look at measures of reapplication behavior. Panel A includes all individuals. Panel B restricts to the top-quartile of baseline scorers, i.e. those who achieved a percentile rank of 75 or higher in the first exam attempt. All regressions include baseline exam type fixed effects and control for the usual set of baseline characteristics. Columns 3–6 additionally control for the baseline percentile rank. Robust standard errors are in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

C.11 Treatment effects on attempts: For college graduates under age 30

	# Attempts		
	(1) Single Male	(2) Single Female	(3) Married Female
Info	-0.30	-0.93***	0.37
	(0.30)	(0.31)	(0.37)
Info × HH prime	-0.28	0.68	-1.36**
	(0.44)	(0.44)	(0.54)
HH prime	0.16	-0.26	1.01***
	(0.32)	(0.30)	(0.38)
N	846	861	540
Control Mean	6.19	6.76	6.40

Notes: This table considers treatment effects on the (hypothetical) number of attempts candidate are willing to make. Sample is restricted to survey respondents who are college graduates under age 30. The outcome is top-coded at a maximum of 10 attempts. Regressions include exam strata fixed effects. Robust standard errors are shown in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

C.12 Heterogeneous effects on attempts by marriage proposal

	Single Male		Single Female	
	(1) Proposal=1	(2) Proposal=0	(3) Proposal=1	(4) Proposal=0
	Panel A: Without controls			
Info	-0.16	-0.39	-1.73***	-0.79**
	(0.68)	(0.25)	(0.64)	(0.31)
Info × HH prime	0.13	-0.25	1.60*	0.45
	(0.98)	(0.36)	(0.88)	(0.44)
HH prime	0.54	0.18	-0.24	-0.26
	(0.72)	(0.27)	(0.61)	(0.30)
N	162	1234	200	873
Control Mean	5.74	6.24	6.84	6.81
	Panel B: With controls			
Info	-0.46	-0.29	-1.50**	-0.68**
	(0.69)	(0.25)	(0.65)	(0.31)
Info × HH prime	0.48	-0.35	1.33	0.27
	(0.96)	(0.36)	(0.91)	(0.44)
HH prime	0.27	0.24	-0.05	-0.25
	(0.72)	(0.26)	(0.64)	(0.30)
N	162	1231	199	871
Control Mean	5.74	6.24	6.84	6.81

Notes: This table considers heterogeneous effects on the (hypothetical) number of attempts single candidates are willing to make by whether they have received a marriage proposal by the time of the survey. Columns 1–2 consider treatment effects on single men, whereas columns 3–4 consider effects on single women. Odd-numbered columns restrict to those individuals who have received at least one marriage proposal, whereas even-numbered columns consider those who have not. Panel A reports effects without any controls, whereas Panel B reports effects after controlling for prior belief about difficulty of success, age, college completion, 10th grade exam performance, board exam type, caste, number of siblings, household income, and whether parents had less than a 10th grade education. The outcome is top-coded at a maximum of 10 attempts. Regressions include exam strata fixed effects. Robust standard errors are shown in parentheses. * p<0.10, ** p<0.05, *** p<0.01

C.13 Baseline exam performance by exam type

	Group 1		Group 2A		Group 4	
	(1) Top 1%	(2) Top-scorer	(3) Top 1%	(4) Top-scorer	(5) Top 1%	(6) Top-scorer
Married Female (MF)	-0.005	0.002	-0.001	-0.001	-0.003***	-0.001***
	(0.004)	(0.002)	(0.001)	(0.000)	(0.000)	(0.000)
Single Female (SF)	0.006*	0.001	-0.002***	-0.002***	-0.001***	-0.001***
	(0.003)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
p-value: MF=SF	0.018	0.595	0.004	0.032	0.000	0.035
Baseline Controls	Y	Y	Y	Y	Y	Y
N	7937	7937	53641	53641	200692	200692
Depvar Mean, Single Male	0.014	0.000	0.004	0.003	0.004	0.002

Notes: TThis table presents gender differences in top-end baseline exam performance for first-time applicants, disaggregated by the Group exam in which they first appeared. Columns 1–2 report estimates for Group 1 applicants, Columns 3–4 for Group 2A, and Columns 5–6 for Group 4. The dependent variables are: whether an applicant ranked in the top 1% of scorers in their first exam (Columns 1, 3, and 5), and whether they were a "top-scorer," defined as achieving a rank greater than or equal to the number of vacancies notified in that recruitment (Columns 2, 4, and 6). All regressions control for age, caste, marital status, undergraduate degree type, medium of instruction in high school and college, and birth district fixed effects. * p<0.10, ** p<0.05, *** p<0.01