Closing the Gender Gap in Re-Applications for Senior Roles

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Abstract. We study the effects of behaviorally-informed interventions to close the gender gap in re-application rates to senior roles. We randomized 1,386 female and male applicants ("finalists") who were recently rejected in the final assessment round for a senior role into three conditions: *Control*, *Confidence*, and *Confidence+Commitment*, providing finalists with confidence-boosting information and—for female finalists—indicating the organization's commitment to increasing gender diversity. Both treatments closed the gender gap in re-application rates. However, the treatments differed in how they achieve this: in the *Confidence+Commitment* condition, women significantly increased their application rates by nearly 30% (10.9 percentage points), while in the *Confidence* condition, the gender gap closed because men's re-application rates were lower. Our results inform future research on interventions to reduce gender gaps and offer a practical solution for organizations aiming to achieve gender parity in leadership.

Introduction

Fifteen percent of CEOs in the Fortune 500 companies (Buchholz 2022) and only 31 percent of senior managers globally are women, as compared to the labor force, which consists of almost 50 percent women in most developed countries (Grant Thornton 2021). The gender gaps in leadership are the tip of the iceberg of other pervasive gender gaps in economic outcomes, including the gender pay gap (Blau & Kahn 2017). For example, whereas "horizontal" factors such as occupational segregation contribute to the gap in pay (Goldin 2014; Blau and Kahn 2017), there is also evidence that "vertical" factors matter, with fewer women than men in senior leadership positions within organizations (Brynin 2017; Bertrand and Hallock 2001; Chilazi, Bohnet and Hauser 2021).

In addition to fixing discriminatory demand-side practices (Bohnet 2016),[1] organizations may take proactive actions to avoid conditions that give rise to supply-side differences in career advancement. For example, female employees have been found to be less likely to nominate themselves for a promotion (for example at Google, see Bock (2015)), or to re-apply for a similar senior role after being rejected for a senior job by an organization (Brands and Fernandez-Mateo 2017). This behavior has been theorized to be the result of women's underrepresentation in leadership rungs, which leads to women being more uncertain and less confident about their perceived fit for these roles (Eagly and Karau 2002; Heilman 2012; Brands and Fernandez-Mateo 2017). These "leaning out" behaviors may be the result of experiences or fears of backlash for being

[1] Controlled lab studies have shown that men are often preferred to equally qualified women for male-typed jobs and as leaders in competitive environments (Bohnet, van Geen, and Bazerman 2016; Coffman, Exley, and Niederle 2021; Exley et al. 2022), especially after a short employment leave (Kristal et al. 2022). Men are more likely to receive credit from collaborative work (Sarsons et al. 2021), be interviewed for senior management jobs (Ginther and Kahn 2009; Ibarra, Carter, and Silva 2010) and receive promotions into senior roles, even when performing less well than their female counterparts (Benson, Li, and Shue 2021). This may be the result of a combination of accurate and inaccurate beliefs about men and women (Bordalo et al. 2019; Bohren et al. 2019, 2023), leading to stereotyping and discrimination.

too assertive violating stereotypes about how women should behave, and thus perpetuate women's lower willingness to apply for senior roles (Rudman 1998; Rudman and Glick 2001).[2]

In many organizations, employees have to take the initiative to apply for promotions, and often more than once to succeed—making the gender gap in "re-application" for senior positions a timely, but understudied problem. Little is known about interventions that can close the re-application gender gap. A related but distinct literature has made promising advances, testing interventions aimed at increasing women's willingness to compete in controlled lab or online contexts—with the implication that these results might also shed light on women's willingness to apply for competitive senior leadership roles in organizations.[3] However, much less is known about causally tested interventions on (re-)applications to senior roles in real-world organizational settings. Our study aims to fill this gap in the literature by testing scalable interventions to close the gender gap in re-application rates in a large public sector organization.

We conducted a field experiment with a large public sector employer in Australia between July 2018 and March 2019. In particular, the [organization name blinded for review] Government's

[2] Similar supply-side differences that likely contribute to the lack of female representation in leadership roles, including a gender difference in willingness to compete and in confidence (Niederle and Vesterlund 2007, 2011, Saccardo et al. 2018; Exley and Nielsen 2022) and apply for senior positions even when they are equally qualified (Mohr 2014; Coffman et al. 2019). Perceptions of suitability for a "stereotypically male" job can also lead to self-stereotyping (Coffman 2014, Coffman et al. 2023), further reducing applications by women to (male-typed) senior leadership roles. Such (self-)stereotyping even occurs in discussions and content production (Gallus & Bhatia 2020) which may be hard to change; that said, when female representation in leadership has increased, these stereotypes have been shown to evolve, such that language describing women in an organization becomes more positive in relationship to leadership and agency (Lawson et al. 2022).

[3] For instance, affirmative action has been shown to increase competitive tournament entry for women (Balafoutas and Sutter, 2012; Niederle, Segal, & Vesterlund 2013), including in the field where "reservations" have substantially increased the number of women standing for and winning political office in a natural experiment in India (Beaman et al. 2009). However, affirmative action quotas at board level have not necessarily led to more gender representation in senior management (Page et al. 2023). Other interventions that have reduced the gender gap in competitiveness include informational messages pertaining to the gender gap (Kessel et al., 2021), shifting the default of promotion entry from "opt in" to "opt out" (He, Kang and Lacetera 2021), mentoring programmes (Baldiga and Coffman, 2018), changing job adverts to reduce uncertainty and refrain from using competitive pay structures (Gee, 2018; Flory et al. 2015, Samek 2019), increasing the rewards of competition (Flory et al., 2015; Mulligan and Rubinstein, 2008; Petrie and Segal, 2015), and individualized performance information and competition entry advice (Wozniak et al. 2014; Ertac and Szentes 2011; Brandts et al. 2015; Berlin and Dargnies, 2016). However, using more inclusive language does not affect women and men's competitiveness (Balafoutas et al. 2023).

Behavioural Insights Unit conducted this research as part of a wider [organization name blinded for review] Government objective to increase the proportion of women in senior leadership roles. Our sample comprises $N = 1{,}386$ male and female internal job candidates who applied for a senior role and were invited to the final round of recruitment, but were not successful in receiving an offer for the role at hand. After being rejected, these "finalists" were randomly assigned to one of three conditions, with the *Control* condition representing the status quo at the time (i.e. no further action was taken by the organization after an applicant got rejected).

To motivate our interventions, we built on the seminal paper and theoretical framework by Brands and Fernandez-Mateo (2017) who posit that, following a recent rejection, women who have attempted to break through the proverbial glass ceiling may feel they lack the adequate fit for such roles (e.g., skills, experience or personal characteristics). Indeed, in qualitative interviews and a large survey preceding our field experiment, we previously found corroborating evidence for such behaviors in this public sector organization: women who responded to the survey and were recently rejected after applying to a senior role often felt that they did not have the "right skill or support" or the "right personal profile" for a senior role.[4] As one female middle manager in an interview succinctly put it: "I do look to see what is out there but I always look at them [job advertisements] and go 'I couldn't meet that! There is no way that I could meet that!'" These qualitative findings are consistent with previous work highlighting overconfidence in men and underconfidence in women (Niederle & Vesterlund 2007).

[4] Specifically, in a survey that was sent to 3,000 applicants who recently went through the application process (of which N=479, or 15.9%, responded to the survey), one of the questions posed was: "Are there any factors you feel might limit your ability to take on a more senior role in the public service in the future?" The two most common responses that women who identified at least one limiting factor chose were "Not having the right skills or support" (18%) and "Not having the right personal profile for a senior position" (10%). Men selected the same options 8% and 11%, respectively.

Methods

We first summarize the experimental conditions, before outlining the theoretical literature that inspired them. Our intervention messages in the first treatment arm—referred to as the *Confidence* condition—were sent to finalists in an email 4-7 days after they had received the rejection by an HR representative. In a second treatment arm—the *Confidence+Commitment* condition—the HR representative followed up the email message with a phone call with additional information aimed at demonstrating the organization's commitment to rejected finalists, and in particular, rejected female finalists. We focused on finalists because their previous progression into a final interview round indicated that they possessed appropriate skills and met the requirements for a senior role, thus ruling out large differences in candidate quality as a potential explanation.[5]

In both the *Confidence* and *Confidence+Commitment* treatments, the interventions provided positive feedback to finalists about their past performance relative to others—giving them confidence about their qualifications for the job—and informed them that the organization wanted them to apply to a similar role again—encouraging finalists to do so. The messages also reminded finalists that applying multiple times was common in order to be successful.

In addition, in the *Confidence+Commitment* condition only, the HR representative provided additional "hands-on" support to the finalists: HR (as a representative of the firm) demonstrated the firm's commitment to wanting applicants to re-apply soon by identifying potentially relevant job openings at a similar seniority level and directing finalists to them. Finally, to address the concern that female finalists might be more likely than their male counterparts to feel they were unwanted in senior roles, the HR representative in the *Confidence+Commitment*

[5] Participants were applicants to so-called "pipeline" roles which are senior roles within the organization. Applicants made it to the interview assessment but were not successful for the role. Only applicants to three participating departments were included in this trial. These three departments were selected as trial partners based on their commitment to drive diversity, proportion of female applications, and overall size.

condition mentioned only to female finalists that the organization was "committed to having more women in senior roles" and wanted to "encourage our strongest applicants to continue to apply for jobs with us."

Whilst the latter adaptions to the treatment mean that the *Confidence+Commitment* condition is not only differentiated by the personalized support via a phone call from the *Confidence* condition, we chose to add these additional design features to strengthen the treatment further and ensure that potential hurdles identified in the qualitative and survey phases had been taken into consideration in the intervention design.[6] A copy of the intervention email and phone scripts are available in the Supplementary Materials.

The participant sample initially included 1,614 finalists but the final sample was reduced to 1,386 finalists because 228 finalists chose not to answer the question about their gender. Based on estimated recruitment flows, we expected to achieve 1,350 finalists within four months. Power calculations showed that a sample of 1,350 finalists would allow us to detect a 9.5-percentage point difference between a treatment condition and the control condition. However, due to lower-than-expected recruitment activities at the three participating departments, the field experiment ran for eight months, which resulted in 1,614 finalists (of which, as described above, 1,386 finalists can be included in the analysis, as they self-identify as either female or male).

We randomized the applicants into different groups as we identified them in the weekly recruitment reports. We stratified them by gender and departments so that we would have roughly equal proportion of treatment and control between men and women and roughly equal proportion of treatment and control in each agency. We also ensured that the weekly data and historical data

[6] We acknowledge that adding these additional features to the script confounds the "purity" of our treatment to some extent; however, testing the effectiveness of particularly strong treatment levers (Hauser and Luca 2015) was our primary interest in the field, even if it came at a slight cost to cleanly identifying the precise channel. We encourage future research to separately cross-randomize these variations if this is feasible in future field trials.

combined were balanced on several variables during the randomization process (e.g. internal/external applicants, department, and month in which the application was completed).

Unless otherwise specified, we use linear probability models with robust standard errors. However, all our results are robust to alternative specifications using logit models (see Supplementary Materials). As per the trial protocol, we included regressions that controlled for the department, to which a candidate applied. We also planned to include month of the applications in the model but with the data we received from the trial partners did not include this information. As a proxy, we therefore instead controlled for the month that the participants entered the trial.

Related literature and predictions

We hypothesize that, as a result of our interventions, women would be more likely to apply to similar senior roles at the organizations for at least three reasons.[7] We group our interventions, and the underlying literatures motivating them, into either "building confidence"—which was the focus of the emails sent by HR and was common to both the *Confidence* condition and the *Confidence+ Commitment* condition—or "demonstrating organizational commitment"—which was the focus of the HR phone call, unique to the *Confidence+Commitment* condition.

First, with regards to "building confidence," the interventions were designed to boost confidence in the finalists' relative abilities (Ehrlinger and Dunning 2003; Niederle and Vesterlund 2007; Coffman 2014) by telling them that they made it to the final stage of recruitment and that only high-performing applicants ("fewer than 1 in 5") have gotten this far in the application process. Furthermore, in order to avoid that equally-performing women evaluate themselves less positively

[7] We did not have a corresponding set of hypotheses about the effect our interventions would have on men. Many studies have not found that feedback—or other interventions—affect men's willingness to compete. Men have, however, been shown to be more sensitive to the level of competition they are facing (Berlin and Dargnies, 2016). We note that Lovasz et al. (2022), who found that encouragement had a positive effect on women's but a negative effect on men's performance.

overall and respond less to the same positive feedback than men (Bohnet, Hauser and Kristal 2022; Coffman, Collis and Kulkarni 2023; Exley and Kessler 2022), we explicitly embedded messages of encouragement to re-apply in the email ("we'd like to encourage you to apply for future vacancies"), which have been shown to keep women in a competition for longer and perform better (Lovasz et al., 2022).

Second, to reduce any negative inferences from the failed attempt which might consequently reduce women's willingness to compete (Shastry, Shurchkov and Xia 2020; Coffman, Araya and Zafar 2021), we framed the email in such a way that made clear that multiple attempts are commonplace and should be expected ("most people apply for multiple jobs before they are successful, particularly at the senior levels"). Taken together, we therefore expected female finalists to receive a confidence boost following the email in the *Confidence* and *Confidence+Commitment* conditions and subsequently increase their willingness to re-apply for a similar senior role.

Finally, with regards to "demonstrating organizational commitment", past work suggests that members of traditionally underrepresented groups, including women, might have to be "invited in" more explicitly to affect their job applications (Kuhn and Shen 2023). In addition, recent findings suggest that minority groups, including women, increase their willingness to apply to jobs when specific commitments to women are mentioned, such as in the form of diversity targets (Flory et al. 2021; Kirgios, Silver and Chang 2021).

Our *Confidence+Commitment* condition therefore went a step further in demonstrating the firm's commitment to having women in senior roles. First, the HR representative identified—based on the finalist's profile—other potential opportunities of job openings for senior roles currently available on the job platform and relevant to the finalist. This investment of time by HR might have served as a credible signal to finalists (Kirgios et al. 2021). Second, the HR representative mentioned (to female finalists only) that the organization was committed to having more women

in senior leadership would increase women's likelihood to re-apply to similar senior roles. Taken together, we hypothesize that these features—above and beyond the confidence boost through the email—would increase women's belief that the organization genuinely wanted them to re-apply and therefore increased their willingness to re-apply to senior roles in the *Confidence+Commitment* condition.

Results

Women comprised 38.3% of the applicants to senior leadership positions in our study. In the *Control* condition, three months after applicants were rejected from their previous application, male applicants were 67.6% (19.2 percentage points [p.p.]) more likely to apply to another senior role than female applicants. This effect is statistically significant ($b = 0.827$, $p < 0.001$) and consistent with findings from the previous literature (e.g., Brands and Fernandez-Mateo 2017). The results are similar at six months after the previous application: men were 45.1% (18.5 p.p.) more likely to re-apply than women (see Table S1).

As Figure 1 shows, the results were markedly different in our two treatment conditions. Specifically, in both treatment conditions, the gender gap disappeared: in the *Confidence* condition, the gender gap in re-application rates was not present at either three or six months (gender gap at three months: 2.4 p.p.; at six months: 5.5 p.p.). These resulting gender gaps are statistically indistinguishable from zero (both ps > 0.05), indicating that women and men re-applied to future senior roles at similar rates in the *Confidence* condition.

The gender gap in re-application rates also disappeared in the *Confidence+Commitment* condition, at both three months (0.9 p.p.) and six months (2.2 p.p.). Both these resulting gender gaps in this condition are statistically indistinguishable from zero (ps > 0.05), suggesting that both women and men re-applied to senior roles at the same rates in the *Confidence+Commitment* condition.

While both treatments led to the closing of the gender gap, two potential—not mutually exclusive—pathways could have led to a closed gender gap in these conditions: women could have re-applied at a higher rate in the treatment conditions than in the *Control* condition, or men could have re-applied at a lower rate in the treatment conditions, or both. We find suggestive evidence that both pathways play a role, but to differing extents in the two conditions.

Table 1 shows the results of a linear probability model predicting re-application rates at six months that tests the two pathways, first separately for female and male applicants (Columns 1 and 2, respectively) and then jointly across female and male applicants (Columns 3 and 4), predicting re-application status at six months by treatment and, where appropriate, by gender.

We begin by examining the treatment effects for women. While there was no significant increase in women's application rates in the *Confidence* condition (albeit directionally the regression coefficient is positive: $b = 0.044$, $p = 0.391$), a significant and positive difference did emerge for women in the *Confidence+Commitment* condition: women were nearly 30% (10.9 p.p.) more likely to re-apply to a senior role within six months ($b = 0.109$, $p = 0.035$), increasing the percentage of finalist women who re-applied from 40.0% in the *Control* condition to 51.9% in the *Confidence+ Commitment* condition.

In contrast, men exhibited a noticeably different behavior in response to the two treatments. Relative to 59.5% of men who re-applied in the *Control* condition, men significantly reduced their re-application rates in the *Confidence* condition by about 14% ($b = -0.086$, $p = 0.041$) to 50.9%, and directionally but not significantly decreased their re-application rates in the *Confidence+ Commitment* condition ($b = -0.054$, $p = 0.205$), down to 54.1%. In sum, while men's re-application rates were reduced in the *Confidence* condition, men were unaffected by the additional commitment provided in the *Confidence+Commitment* condition.

When jointly estimating re-application rates by treatment and gender (see Table 1 Column 3), we found consistent results. Women's significantly increased re-application rates were the

driving factor in closing the gender gap in the *Confidence+Commitment* condition (b = 0.109, p = 0.035) and only to a lesser (and not significant) extent in the *Confidence* condition. Meanwhile, in the *Confidence* condition, the interaction coefficients of men and the two treatments are both negative: this reflects that men, who were more likely to re-apply in the *Control* condition (b = 0.185, $p < 0.001$), re-applied less in both treatments. The negative interaction coefficient for *Confidence* * *Male* (b = -0.130, p = 0.052) indicates that male applicants' normally high re-application rates were reduced relative to women's slightly (but not significantly) increased rates in that condition. The same logic applies to the negative interaction coefficient for *Confidence+Commitment* * *Male* (b = -0.163, p = 0.015), demonstrating that men's normally high re-application rates were reduced relative to women's significantly higher rates in that condition.

These results are robust to variations in econometric specifications, including controlling for department and months fixed-effects (Table 1 Column 4), using a logit model (Table S1), as well as using a shorter re-application timeframe of three months (see Tables S2 and S3),

Taken together, these results suggest that both pathways—operating in opposite directions—were instrumental in closing the re-application gender gap, with women re-applying more in the *Confidence+Commitment* condition and men re-applying less in the *Confidence* condition.

Discussion

Tackling gender gaps in organizations' leadership ranks requires a pipeline of qualified men and women to apply for senior roles. Consistent with past research (Brands and Fernandez-Mateo 2017), however, we found that female employees in our *Control* condition were less likely to apply to another similar opening after receiving a rejection. To tackle this understudied issue in the workplace, we report on novel interventions that closed this gender gap in re-application rates to senior roles. We showed that an email that provided feedback about people's relative standing and

encourages applicants to re-apply was sufficient in closing the gender gap in application rates, but did so primarily by lowering men's re-application rates. In contrast, an additional (but, arguably, more labor-intensive) phone call by the HR department that underscored the message of the email and demonstrated additional organizational commitment also closed the gender gap, but did so primarily by increasing women's re-application rates.

Our work contributes to our theoretical understanding of belonging, gender and leadership in the workplace (Good, Rattan & Dweck 2012; Raina, Rattan & Ibarra 2017). The feeling of (potentially) belonging to the leadership rungs is an inherently gendered processes, especially as senior positions are often predominantly male dominated. This feeling of "not belonging" is heightened when a minority candidate receives a rejection from an application to such a position, further alienating them and consequentially leading to "leaning out" behaviors (Brands and Fernandez-Mateo 2017). Our results demonstrate that women, who may have previously felt they did not belong, might be encouraged to feel more included: in particular, our work highlights that, while women might be less responsive to potentially generic approaches (e.g. email), an additional personalized call seemed to increase their willingness to "lean in". It is of course possible that women also felt more included when organization signaled a clear commitment to have more women in leadership (Kirgios et al. 2021). Indeed, while most aspects of the interventions tested in our study were "gender-neutral" by design, one exception was that only women—not men—who received a phone call from an HR representative were made explicitly aware of the organization's overall strategy to promote more women into leadership positions. Given a relatively nascent literature on diversity targets (Flory et al. 2021; Kirgios et al. 2021), our results showing that women were more likely to significantly increase their re-application rates in the *Confidence+Commitment* condition suggest that the gender-specific nature of this intervention might have played a role in yielding different outcomes and warrant further research delineating these effects.

Our work also adds to previous research on the factors influencing the gender gap in application rates. For example, different compensation schemes, the gender composition of the team structure and social network have differential effects on attracting, and placing, men and women in the workplace (Flory, Leibbrandt and List 2015; Leibbrandt and List 2014; Yang, Chawla and Uzzi 2019) while differences in men's and women's major choices in college (Reuben et al. 2017) and job search (Cortés et al. 2022) contribute further. Organizations can also attract a more diverse workforce by explicitly signaling their interest in employee diversity (Flory et al. 2019) or appealing to social preferences (Samek 2019). Our study contributes to this growing literature by demonstrating that organizations can reduce the extent to which female employees feel marginalized after receiving a rejection for a senior job, by encouraging them to apply to similar jobs again, alongside credible commitments by the organization to support them.

Conversely, while the confidence boost delivered in an email had a directionally positive effect on women re-applying, we found that men felt discouraged by the same email message. While we cannot pinpoint a specific reason for why men applied less in the *Confidence* condition, future research may want to look at whether men and women perceive differently the same quantitative feedback ("fewer than 1 in 5 applicants") about their standing relative to other applicants, e.g., because of the gender differences in how people subjectively evaluate their own performance (Exley and Kessler 2022), or whether encouraging men to re-apply was viewed by them as a generic message given to all applicants, thereby increasing men's perception that the competition will be fiercer for future job openings (Gee 2019; Flory et al. 2015). While our study offered a first insight into the gendered dynamics on re-application decisions in a field experiment, we encourage future researchers to study these questions both within real organizations and controlled lab settings (Hauser, Linos & Rogers, 2017; Falk & Heckman 2009; Lee et al. 2022).

In sum, our results based on a field experiment in a large public sector organization provide novel insights into the benefits of organizational design in considering equality, diversity and inclusion aspects across common HR practices (such as rejection emails), to counteract practices that could potentially maintain or exacerbate gender differences in behaviors (such as the gender gap in re-application rates). The success of our *Confidence+Commitment* condition in particular has practical and important implications: while it raised women's re-application rates significantly, it did not have a negative effect on men's re-application rates, suggesting that this intervention does not come at a cost to either gender. Despite its additional labor costs for the organization, the absence of "adverse impact" might make it particularly attractive for further exploration.

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Figures and Tables

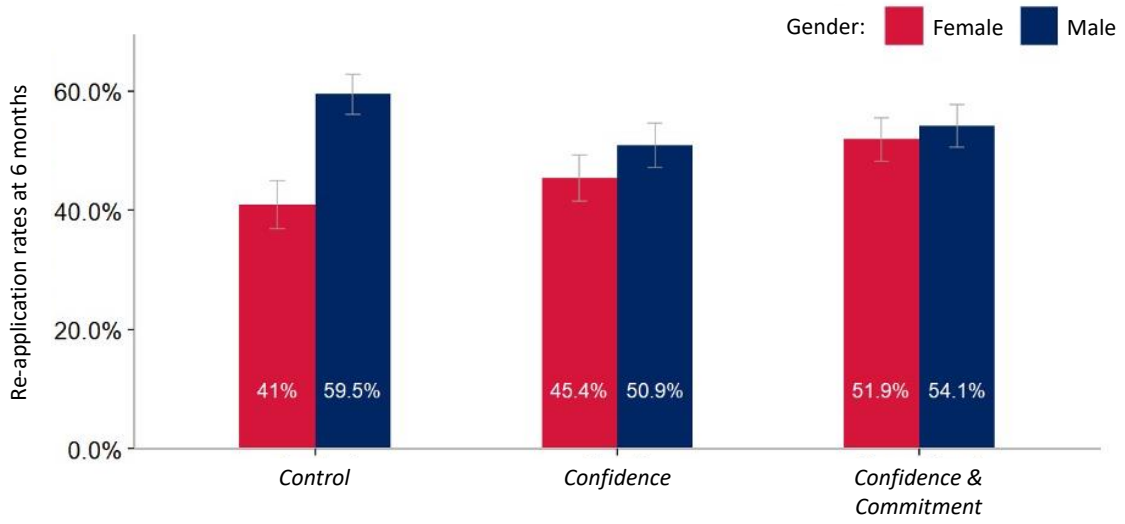

Figure 1. Relative to the *Control* condition, both the *Confidence* condition and *Confidence+ Commitment* condition closed the gender gap in re-application rates after 6 months. The closing of the gender gap was largely driven in by an increase in women (red bars) re-applying more in the *Confidence+ Commitment* condition, whereas men (blue bars) re-applied less in the *Confidence* condition. Total *N*=1,386 across three conditions.

Table 1. Linear probability model predicting re-application rates to a similar senior role within six months based on randomly assigned condition (*Confidence* condition or *Confidence+Commitment* condition, relative to *Control* as baseline) in Columns 1 and 2 for female and male applicants, respectively. Across both male and female applicants, Columns 3 and 4 include an indicator variable for the gender of the applicant without and with fixed effects, respectively. Significance: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Dependent variable: Re-application by 6 Months				
	(1) Women	(2) Men	(3) Women & Men	(4) Women & Men
Confidence condition	0.044	-0.086*	0.044	0.045
	(0.052)	(0.042)	(0.052)	(0.052)
Confidence+Commitment condition	0.109*	-0.054	0.109*	0.109*
	(0.052)	(0.043)	(0.052)	(0.052)
Male Applicant			0.185***	0.182***
			(0.048)	(0.048)
Male Applicant * *Confidence* condition			-0.130^{+}	-0.132*
			(0.067)	(0.067)
Male Applicant * *Enc. and Comm.* condition			-0.163*	-0.163*
			(0.067)	(0.067)
Constant	0.410***	0.595***	0.410***	0.332***
	(0.037)	(0.030)	(0.037)	(0.048)
Department Fixed-Effects	No	No	No	Yes
Month Fixed Effects	No	No	No	Yes
Observations	553	833	1,386	1,386
R^2	0.008	0.005	0.013	0.021
Adjusted R^2	0.004	0.003	0.010	0.015