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**Article — Published Version**

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Industrial Relations Journal

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*Suggested Citation:* Asanov, Igor; Mavlikeeva, Maria (2022) : Can group identity explain the gender gap in the recruitment process?, Industrial Relations Journal, ISSN 1468-2338, Wiley, Hoboken, NJ, Vol. 54, Iss. 1, pp. 95-113, <https://doi.org/10.1111/irj.12392>

This Version is available at:

<https://hdl.handle.net/10419/287873>

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# Can group identity explain the gender gap in the recruitment process?

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## Abstract

Despite evidence that the gender gap in the labour market favours men, aggregate findings from correspondence studies show that women are more likely than men to be invited for a job interview. We hypothesize that the predominance of women among recruiters may explain this somewhat puzzling finding; recruiters may favour applicants of their own gender. We use the data from a large-scale correspondence study to test this hypothesis. As expected, we find that female applicants are more likely to receive callbacks for interview. We also see that in our sample the majority of contact persons responsible for the recruitment process are female. More importantly, we find that if recruiter and applicant are of the same gender, then the likelihood that the applicant will be invited for an interview increases. These findings reveal the gender favouritism at the selection stage in the labour market.

## 1 | INTRODUCTION

The gender gap in the labour market has persisted over the years, with women having poorer labour market outcomes than men. For instance, compared to men, women earn less on average and less frequently reach the highest levels of managerial or professional occupations (Altonji & Blank, 1999; Weichselbaumer & Winter-Ebmer, 2005). These unequal labour market outcomes could be due to

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discrimination against women in the labour market. However, correspondence studies investigating discrimination at the selection stage show that on average female candidates are more likely to be invited for interviews than men (Carlsson, 2011; Riach & Rich, 2002). The extent of the observed gender gap varies by country, industry and occupation under study<sup>1</sup> (Albert et al., 2011; Balkan & Cilasan, 2018; Bertrand & Duflo, 2016; Booth & Leigh, 2010; Carlsson, 2011; Gornall & Strebulaev, 2018; Neumark et al., 1996; Petit, 2004; Weichselbaumer, 2004), but the aggregate evidence gravitates towards a somewhat surprising pattern of favourable treatment of women at the selection stage of the recruitment process (Albert et al., 2011; Birkelund et al., 2019; Booth & Leigh, 2010; Gornall & Strebulaev, 2018).

Different theories have been proposed to explain this pattern. One notion is that it is due to occupational segregation in the labour market. Evidence shows the probability of women being called for interviews relative to men varies depending on whether the profession is stereotypically male- or female-dominated (Carlsson, 2011; Riach & Rich, 2006; Rich, 2014). Another theory emphasizes the role of human capital and self-censorship among women (Petit, 2007). Female candidates tend to apply for low-skill positions and can be less ambitious than male candidates. In turn, this might explain the high rate of women being invited to take up low-prestige positions, and lower rates of females hirings for high-prestige positions (Carlsson, 2011; Neumark et al., 1996; Petit, 2007).

Gender differences in candidates' preferences may also affect the gender imbalance at the selection stage. Women and men exhibit different levels of altruism, trust, fairness and envy (Azmat & Petrongolo, 2014). Thus, assessing productivity of the applicants based on gender stereotypes, recruiters may consider the applicant an unsuitable match for a certain job (Stern & Madison, 2022; Weichselbaumer, 2004). However, Weichselbaumer's (2004) correspondence study does not support this phenomenon, rather showing that neither personality traits nor productivity have an influence on the gender bias in the labour market. Thus, there is either a lack of empirical evidence to support these various theories, or they fail when tested to explain the aggregate pattern of the positive treatment of female candidates at the job selection stage compared to male candidates.

We investigate this further by testing an alternative explanation for the gender imbalance at the selection stage of the recruitment process. We conjecture that the phenomenon of female candidates being more likely to be invited for interviews can be explained in two ways. First, most recruiters are female—in many countries over 70% of HR positions are occupied by women (Reichel et al., 2010).<sup>2</sup> Second, people tend to treat members of their gender group more favourably (Ahmed, 2007; Billig & Tajfel, 1973; Charness et al., 2007; Chen & Li, 2009) according to group identity theory (Akerlof & Kranton, 2000; Tajfel & Turner, 1979). Thus, if recruiters more often call back candidates of the same gender as themselves, then, given that most recruiters are women, callback rates will be higher for female than male candidates on average.

To test this conjecture, we first provide a quantitative meta-analysis that assesses if women receive more callbacks on average than men in correspondence studies (Study 1). We find support for this pattern. Next, using the data from a large correspondence study we conducted in the context of the Russian labour market, we assess if the recruiters favour applicants of their own gender (Study 2). We applied for large numbers of vacancies using fictitious resumé with randomly varied characteristics

<sup>1</sup>A series of correspondence and meta-analysis studies provide evidence of the gender gap at the selection stage varying between 0.58 and 3.15. In most studies, the average ratio is about 1.2: (1.34) Albert et al. (2011); (1.3) Gornall and Strebulaev (2018); (1.28) Booth and Leigh (2010); (1.26) Birkelund et al. (2019).

<sup>2</sup>See US Bureau of Labour Statistics (BLS) for details of the US labour market available at <https://www.bls.gov/cps/cpsaat39.htm>

and tracked callback rates which we assumed were an indication of interest in the applicant. As part of our randomization strategy, we alternated randomly between female and male applicant names. In line with our meta-analysis results we found that female applicants were more likely to be invited for an interview than male applicants.

If a job advertisement included a contact name (recruiter), this allowed us to identify the recruiter's gender since in the Russian language most female and male names (and surnames and patronymics) have specific feminine or masculine forms. As expected, most of the known contacts in our sample were female. Thus, we could test the conjecture that if the applicant is of the same gender as the recruiter contact person, then he or she will be more likely to receive a callback compared to an applicant of the opposite gender.

We found that if the recruiter contact was female, then female applicants were more likely to be called back for interview. This pattern also holds if the recruiter contact is male (i.e., males are more likely to be interviewed). More generally, we show that candidates of the same gender as the contact person are more likely to be invited for an interview compared to applicants of a different gender from the recruiter contact person. This explains the somewhat puzzling finding of favourable treatment of females in the labour market: In-group favouritism and predominance of females in recruiter positions explain the aggregate pattern of positive treatment of female compared to male candidates at the selection stage.

## 2 | RELATED LITERATURE

Women tend to have poorer labour outcomes compared to men, for example, they tend to earn less, and less often occupy managerial and professional positions than men (Altonji & Blank, 1999; Fleiss & Berlin, 2009; The International Labour Organization [ILO], 2018; Weichselbaumer & Winter-Ebmer, 2005). One can conjecture that female candidates are discriminated against at the selection stage of the hiring process. Indeed, correspondence experiments show that women receive fewer invitations—callbacks—for job interviews compared to men in different circumstances (Baert et al., 2016; Bailey et al., 2013; Bursell, 2014; Capéau et al., 2012; Jackson, 2009; Petit, 2007). However, the literature tends to gravitate to counter-intuitive observations: on average, women are more likely to be invited for an interview (Baert, 2018; Bertrand & Duflo, 2016; Booth & Leigh, 2010; Neumark et al., 1996; Petit, 2004; Riach & Rich, 2002; Weichselbaumer, 2004).

One reason for the heterogeneity of results in the experiments could be that the gender gap in callbacks is relatively small, for example, compared to the racial gap. As the sample variability leads to different and often insignificant results, one needs large samples to detect the genuine effect and systematically summarize the literature. Indeed, in the large-scale correspondence study, Gornall and Strebulaev (2018) show that applicants of female entrepreneurs are 9% more likely to generate interest than male entrepreneurs. They support this observation of favourable treatment with a quantitative summary of other studies that further encourage a systematic synthesis of the various findings and a search for an explanation of the gender gap in callbacks.<sup>3</sup>

<sup>3</sup>To compare this result to previous literature, Gornall and Strebulaev (2018) provide a quantitative summary of 22 correspondence studies finding a positive bias of 13% in favour of females when one weighs relative callback ratio by the sample size of the studies. Gornall and Strebulaev (2018) built their analysis on the studies in United States, Canada and Europe that are mentioned in Riach and Rich (2002), Bertrand and Duflo (2016) and Baert (2018).

One of the explanations for the gender employment gap is *occupational segregation* in the labour market. A series of experimental studies have been conducted to assess the gender gap in specific occupational fields. Riach and Rich (2006) investigate the chances of men and women to be hired as an accountant, computer analyst, secretary, or engineer. They find that male applicants are treated unfavourably in female-dominated occupations, such as secretarial jobs, as well as in mixed-gender occupations, such as those of accountant and computer analyst. Similarly, Booth and Leigh (2010) show that recruiters call back female candidates 28% more often than their male peers in female-dominated occupational fields, such as customer service, data entry, sales and waiting staff jobs. Carlsson (2011) finds no evidence of gender difference in male-dominated occupations, but Riach and Rich (2006) report that women are less likely to receive positive responses in male-dominated occupations, such as engineering jobs. Rich (2014) concludes that even if an occupation is stereotyped as strongly male-dominated, the level of unfavourable attitude towards female applicants is lower than that towards men applying to strongly female-dominated professions, where men must send two or even three times as many applications to be invited to interview. In a nutshell, the evidence does not show strong preferences for women in male-dominated occupations, but there is a preference for women in female-dominated and mixed-gender occupations. That is, while the theory of occupational segregation can explain heterogeneous treatment by gender in different occupations, this theory is hard to reconcile with the generally positive treatment of women compared to men on average across occupations at the selection stage.

Alternatively, the gender employment gap might be caused by the *difference in the level of human capital* between men and women. Petit (2007) claims that women have lower human capital or suffer from self-censorship. Thus, employers positively react to their application, expecting higher productivity, especially in low-skilled jobs. In other words, female candidates are not as ambitious as male candidates and apply mostly for the low-skilled positions. That may explain the high hiring rate for women in low-prestige positions and the lower hiring rate in high-prestige positions (Carlsson, 2011; Neumark et al., 1996; Petit, 2007), pointing to a need for more correspondence studies that focus on the gender gap in relatively high-skilled, prestigious jobs.

The observed differential treatment of female and male applicants may also be explained by *gender differences in social preference or personality traits*. Studies show that women and men exhibit different levels of altruism, trust, risk, fairness and envy (Azmat & Petrongolo, 2014; Stern & Madison, 2022). For instance, meta-analysis of risk preferences show that females are slightly more risk-averse (Filippin & Crosetto, 2016), they can react differently in uncertain situations (Loewenstein et al., 2001), or they are more generous (Doñate-Buendía et al., 2022) and agreeable (Feingold, 1994). As recruiters consider fit of the applicant to the job, they can be more interested in applicants of certain gender, based on the recruiters' beliefs about this gender's average characteristics (Arrow, 1973; Phelps, 1972), for example, gender stereotypical personality traits. To detect whether gender-specific personality traits influence gender discrimination, Weichselbaumer (2004) conducted a study in the Vienna labour market, sending applications in response to job openings in four occupational fields: Two feminine and two masculine. For every vacancy, three resumés were sent: one of a typical male candidate, one of a typical female candidate, and one of a female candidate with personality traits typical for men. The findings provide no evidence of personality influencing gender discrimination. Even if the applicants signal certain social preferences characteristic of the occupation they applied for, it has no impact on recruiters' gender hiring preferences. This means that if female candidates send a resumé that indicates social preferences typical for men, they are still treated

as female candidates. Weichselbaumer (2004) concludes that it is purely gender preferences that drive hiring discrimination, and neither personality traits nor productivity influence gender bias in the labour market.

Finally, one can assume that *in-group favouritism* plays a role in the gender labour gap (Lane, 2016; Tajfel & Turner, 1979): A recruiter will treat an applicant of the same gender favourably. Economic laboratory experiments that study how people make decisions about payoffs for in-group and out-group members provide evidence in favour of the in-group favouritism theory (e.g., Chen & Li, 2009; Currarini & Mengel, 2012; Lane, 2016). Similarly, a series of studies using pre-existing natural identity, that is, gender as a united feature of the groups, indicates the significant effect of gender on interactions between the groups (Balliet et al., 2014; Croson et al., 2008; Solow & Kirkwood, 2002). Moreover, within social groups people count on their in-group peers to lead easier communication and cooperation (Akerlof & Kranton, 2000; Tremewan, 2010).

Given abundant evidence of in-group favouritism and that in many countries three-quarters of the positions in human resource management are occupied by women (Reichel et al., 2010), we theorize that in-group favouritism from female recruiters can explain the gender gap in favour of female candidates at the selection stage of the hiring process on average across occupations or skill levels. Evidence from previous studies that aim to test in-group favouritism in correspondence experiments are limited. Carlsson (2011), based on experimental data, ‘rule out the presence of in-group favouritism’ in the labour market in the relatively homogenous low-skill level occupations. Similarly, Booth and Leigh (2010) find no significant interaction effect of the gender of the applicant and recruiter in entry-level positions, for example, waiting staff, data entry. However, Carlsson and Eriksson (2019) show only female in-group bias in low-skilled occupations such as cleaner, truck driver, or chef. Moreover, Erlandsson (2019), looking at a more extensive set of occupations of comparably low skill levels, shows that only male recruiters favour male applicants.

To sum up, the observation that, on average worldwide, women are more positively treated compared to men at the selection stage of the recruitment process has been only recently discussed in the literature and requires quantitative assessment. We, therefore, provide a quantitative assessment of this observation in Study 1. Moreover, the theories that might explain the positive treatment of women at the selection stage do not appear to have much empirical support. Therefore, we test if in-group favouritism can explain this positive treatment in Study 2.

### **3 | STUDY 1: A META-ANALYSIS OF THE GENDER GAP AT THE SELECTION STAGE OF THE RECRUITMENT PROCESS**

#### **3.1 | Method**

To systematically assess the gender gap at the selection stage of the recruitment process, we provided a meta-analysis of the correspondence experiments that study gender labour inequality from 2005 to 2017 (including the year when we conducted our correspondence study). To address publication bias, we exhaustively searched for both published and preprints of correspondence experiments that randomize the gender of applicants irrespective of the place of study. Moreover, we directly collected the number of applications sent and the number

of callbacks per gender, enabling a reliable estimate of the relative callback ratio and odds ratio.<sup>4</sup>

Like Gornall and Strebulaev (2018), we focused on ethnic majority applications to make studies comparable and relate them to the results of our correspondence experiment (Study 2). We used previous reviews of correspondence studies (Baert, 2018; Bertrand & Duflo, 2016; Gornall & Strebulaev, 2018; Riach & Rich, 2002) as the starting point of the literature search. After making an initial list based on previous reviews, we used google scholar to conduct an exhaustive search for other studies that mention ‘correspondence study’, ‘discrimination’, ‘experiment’, ‘field experiment’, ‘labour market’ and also searched through references within the papers until we could not find any other studies that use correspondence methods to assess discrimination.

We found 125 publicly available correspondence studies within the timeframe of 2005–2017. Forty-five of these were suitable for a meta-analysis estimate of gender discrimination (see list of studies included in Meta-Analysis in Appendix A). We excluded the rest of the studies based on the following criteria: the gender of applicant is not randomized; the study uses only male or only female applications; the study does not report gender difference or gender difference reported only in regression estimates and no data is publicly available, or researchers did not share the data after we contacted them.

The data set that we collected as a part of a systematic meta-analytic literature review consists of 45 (K) correspondence studies (not including our Study 2) and includes only studies that randomize candidates’ gender. Overall sample size  $N$  equals 157,836 resumés sent, with 28,192 callbacks. The correspondence studies included in the meta-analysis are from the following 20 countries spread across five continents: Australia, Belgium, Canada, China, Cyprus, Finland, France, Georgia, Greece, India, Israel, Italy, Mexico, Netherlands, Norway, Peru, Spain, Sweden, United Kingdom and United States.<sup>5</sup>

### 3.2 | Results

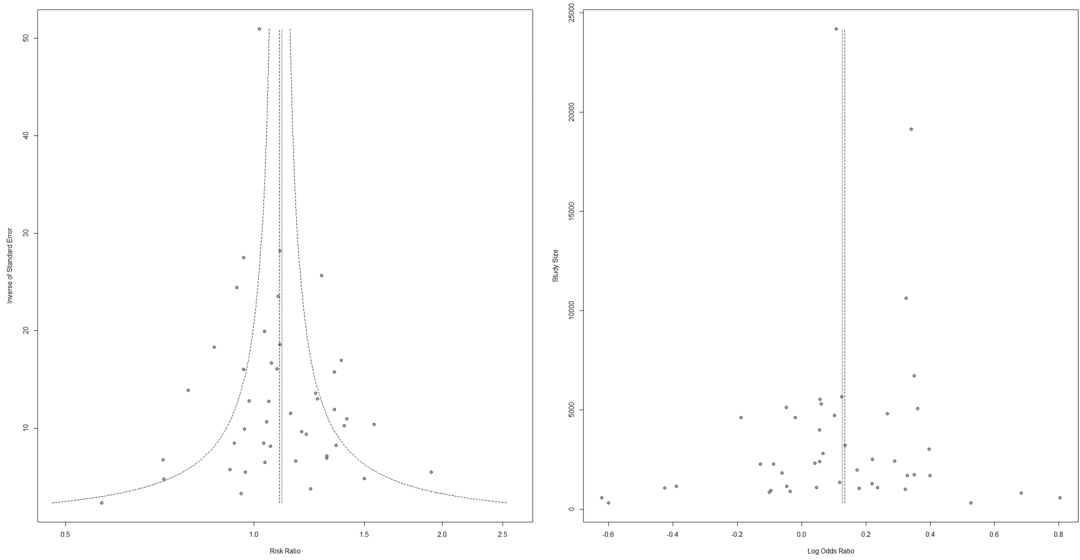
Figure 1 depicts the distribution of risk ratio (left) or odds ratio (right) to receive a callback for female applicants compared to male applicants. Each dot represents an estimate of this effect from each study included in our meta-analysis (45 studies). As funnel plots can give different impressions on the distribution of effect depending on the scale, we report both the risk ratio against inverse of standard error of the study, and odds ratio against sample size of the study (number of sent applications). One can see substantial heterogeneity of the distribution of effects, but they are centred to the right of 1 (equal chance), meaning that a female applicant is more likely to receive a callback compared to a male.

To quantify how likely female candidates will be invited to the interview compared to male applicants, we run a random-effects model and compute a pooled estimate of gender-based discrimination on this data. We find that the risk ratio that women are invited for the interview compared to men is equal to 1.11 [95% confidence interval (CI): 1.06; 1.16,  $p < 0.0001$ ] or the odds ratio is 1.14 (95% CI: 1.07; 1.21,  $p < 0.0001$ ). The results barely change if we use fixed-effects meta-analysis estimates or use trim-fill estimates aiming to account for potentially missing studies in meta-analysis (Duval & Tweedie, 2000). In case of the fixed effect estimate,

<sup>4</sup>Fliess and Berlin (2009) show that odds ratio is preferable for the meta-analysis of dichotomous variables.

<sup>5</sup>These correspondence studies analyze gender labour discrimination requiring various skill levels across a wide set of professions.





**FIGURE 1** Funnel plot of risk ratio (left) and odds ratio (right) of callback for female compared to male applicants.

the odds ratio is 1.14 (95% CI: 1.11; 1.18,  $p < 0.0001$ ), and a random effects model, which accounts for missing values using trim fill, gives an odds ratio estimate of 1.15 (95% CI: 1.08; 1.23,  $p < 0.0001$ ).<sup>6</sup> That is, women are more likely to be invited for the interview. The positive bias towards women is relatively small but statistically significant and worth considering.

## 4 | STUDY 2: A CORRESPONDENCE STUDY OF IN-GROUP FAVOURITISM AS THE MECHANISM BEHIND THE GENDER GAP AT THE SELECTION STAGE OF THE RECRUITMENT PROCESS

### 4.1 | Method

To understand whether in-group favouritism can explain the observed positive bias toward women at the selection stage of the recruitment process, we use data from a correspondence experiment on self-employment that we conducted in the context of the Russian labour market in 2017 (Asanov & Mavlikeeva, 2020). From March to August 2017, we sent over 8600 fictitious resumés in response to real job openings and tracked the interest in the candidate.<sup>7</sup>

<sup>6</sup>If we include data from our experiment (Study 2) in meta-analysis, we get an odds ratio of 1.14 (95% CI: 1.08; 1.22,  $p < 0.0001$ ).

<sup>7</sup>The correspondence experiments imply a certain level of deception as fictitious resumés are sent in response to real job openings. However, this experimental design enables an assessment of the discrimination in the labour market, for example, based on gender, that is considered unlawful in most countries. This discrimination may otherwise remain undetected. To minimize any possible harm that can result from the study, we contacted all the recruiters after receiving a positive callback for the fictitious applicants and rejected the invitations, minimizing the interruption of the hiring process. The data set is anonymized. Thus, our experiment follows the ethically sensitive approach recommended for this study by the Central Ethics Committee at the University of Kassel.



For this experiment, we used the standard practice of developing a bank of resumé sections automating random generation of the applicants' resúmes from these sections (see Lahey & Beasley, 2018). This approach increases the internal and external validity of the correspondence experiment as it ensures that any section of the resumé is drawn at random in line with experimental design. In this way, different characteristics of the resumé (drawn randomly) do not correlate with each other (increasing internal validity), and the results are applicable across a wide range of job applicants or labour market experiences, for example, with different (female/male) names, education, or job history (increasing external validity). Thus, the experiment run with this design on a relatively large sample allows us to make causal inferences about the variable of interest—gender—for a broad group of applicants.

A computer programme was developed to ensure automated random generation of resumé characteristics in line with the experimental design. The resumé was created by selecting random sections of resúmes from a database. These sections included job description, based on an analysis of a large set of real resúmes posted online in the Russian labour market. Job descriptions included sets of sections for every occupation in our analysis: Duties, education, further training, foreign languages, soft skills and professional skills.

Among other applicant characteristics, we varied applicants' gender randomly. Depending on the gender assigned by this process, a computer programme generated an appropriate (male or female) applicant name. We used the most popular first names, patronymics and surnames to generate the applicant's full name.<sup>8</sup> Thus, full names were randomly created, but matched the focal gender.

The programme also randomly assigned ages to applicants (between 27 and 29 years old, average age of about 28.5 years old) and generated appropriate dates of birth.<sup>9</sup> The randomly generated number of years of professional experience was between two and five. Each resumé was based on a randomly chosen design template. The completed resúmes were accompanied by a cover letter selected randomly from among six versions.

As the experiment also aimed to assess the influence of previous experience of self-employment, we sent fictitious resúmes, varying whether applicants were wage-earners or self-employed. In half of the resúmes, we included an objective section where the applicant justified their search for a new position. We applied a full-factorial design by generating four main resumé types. All four types were sent in application for every job offer, in random order and with time lags of about 10 h.

The computer programme contains a form for every vacancy, which is completed by the experimenter before the application is sent. It refers to information on the job offer including advertised job position, webpage address of the advertisement and, if included, contact person for submission of the application. The latter allows us to identify the gender of the person processing the job applications and their subsequent gender preferences for callbacks.

We also ensure external validity of the experiment by sending resúmes to job advertisements in different industries and with different skill levels required (which can have different labour force decomposition). The job advertisements covered occupations in three different industries: Finance, Information Technology and Marketing. Within each of these industries we applied for both high-skilled managerial positions and those of lower-skilled

<sup>8</sup>According to the Civil Registration Database <https://web.archive.org/web/20161119150927/https://zags.mos.ru/stat/imena/>

<sup>9</sup>At this age range, a bias can exist against women who are likely to have children soon (Bertrand & Dufló, 2016; Petit, 2007). The average age of mothers at childbirth in Russia was 28.5 in 2017 (year of the experiment) according to Federal State Statistics Service (Rosstat). <https://rosstat.gov.ru/storage/mediabank/dem21.pdf>

associate professionals, based on the International Standard Classification of Occupations [ISCO] (2008) codes. The positions applied for included: High-skilled Managers (ISCO major group 1; ISCO skill level 3 + 4)—Finance Managers (1211); Advertising and Public Relations Managers (1222); Information and Communications Technology Services Managers (1330); lower-skilled associate professionals (ISCO major group 3; ISCO skill level 3)—Accounting Associate Professionals (3313); Conference and Event Planners (3332); and Information and Communications Technology Operations Technicians (3511).<sup>10</sup>

In the job application process in Russia, candidates are not initially required to send any documents or certificates: They generally submit a resumé which includes only the telephone number and e-mail address; it is not common practice to include a postal address. These characteristics are advantageous for correspondence studies since we did not have to provide fictitious certificates and postal addresses.

To track callbacks, we allocated a mailbox and a phone number to every resumé type. We interpreted callback (phone call) as interest in the candidate. We analyzed the texts of emails and SMSs to identify and categorize the reason for the contact. Thus, our main outcome is callback—a reply to the application from the recruiter (by phone, SMS, or email) to invite the applicant for interview or request additional information. In response to all calls, SMSs, and emails from recruiters, we called back and rejected the invitation so that real applicants would not lose the opportunity to be contacted.

## 4.2 | Sample characteristics

We sent 8651 fictitious resúmes in response to real job openings. In a few cases, the computer programme failed to send all four types of resumé due to a technical issue with one of the domains used for mailing. The issue that was identified and solved, and we excluded these cases from our analysis. Our sample included 8328 resúmes sent in response to 2082 advertised vacancies.<sup>11</sup> The main results of our analysis of callback rates were unchanged with the inclusion of those cases (mentioned above) where the computer programme failed to send all four resumé types.

Applicant genders were assigned randomly: 4168 resúmes were for female applicants and 4160 were for male applicants. Table 1 *Panel A* shows the balance in the resumé characteristics in the main sample. All applicant characteristics are balanced. The number of applications (resúmes) is also balanced across the industries.

As already mentioned, if the recruiter's name was included in the job advertisement, we recorded it. Some 23% of the advertisements included the contact information and, thus, the sample obtained to analyze recruiters' gender preferences include 1980 resúmes. We observed that many email responses were received from the same person the application was sent to. Additionally, given that we had to apply for a large number of job advertisements, we covered a large set of very different companies, mainly direct employers, who were unlikely to have junior administrative personnel (formally responding to job applications) or algorithmic programmes for shortlisting of candidates. For instance, we see in the sample that less than 3% of applications received a simple autoreply.

<sup>10</sup>The International Standard Classification of Occupations [ISCO] (2008) codes in brackets.

<sup>11</sup>The data that support the findings of this study are available from the corresponding author upon reasonable request.

TABLE 1 Summary statistics of resumés

<b>(A) Summary statistics of the main sample (8328 resumés)</b>	<b>Female applicant</b>	<b>Male applicant</b>
Number of resumés	4168	4160
Age in years	28.42 (0.58)	28.39 (0.59)
Work experience in months	52.96 (11.30)	52.74 (11.29)
Industry (%)		
Finance	35	35.8
Finance managers	8.44	8.90
Accounting associate professionals	9.01	9.01
IT	35	33.7
Information and communications technology services managers	8.36	8.12
Information and communications technology operations technicians	9.19	8.73
Marketing	30	30.4
Advertising and public relations managers	7.58	7.36
Conference and event planners	7.48	7.84
<b>(B) Summary statistics of the sample with contact person's name present (1980 resumés)</b>	<b>Female applicant</b>	<b>Male applicant</b>
Number of resumés	978	1002
Age in years	28.45 (0.79)	28.42 (0.81)
Work experience in months	53.28 (15.40)	52.94 (15.22)
Industry (%)		
Finance	53.37	53.69
Finance managers	8.84	8.94
Accounting associate professionals	17.53	18.23
IT	25.77	27.15
Information and communications technology services managers	3.28	3.38
Information and communications technology operations technicians	9.44	10.35
Marketing	20.86	19.16
Advertising and public relations managers	5.96	5.15
Conference and event planners	4.34	4.55

*Note:* The table reports the means for the resumé characteristics listed on the left. Standard deviations for the continuous variables are given in parentheses.

We exploit a distinctive feature of the Russian language that female names, surnames and patronymics generally have an ‘a’ or ‘я’ (ja) ending. This allowed us to identify the gender of most of the contact persons. In seven cases of uncommon names, we coded them manually. In line with the literature, we found that the majority—75.8%—of recruiter contact persons were female.

TABLE 2 Callback rate

	Female applicant	Male applicant	Ratio (female to male)
<i>Panel A: Callback rate for all sent resumés</i>			
Overall	8.30	5.60	1.48
Number of resumés	4168	4160	
<i>Panel B: Callback rate for applications where contact person's name is present</i>			
Overall	13.09	8.88	1.47
Female contact person	13.52	7.17	1.89
Male contact person	11.69	14.06	0.83 (1.20)
Number of resumés	978	1002	

Table 1 *Panel B* reports summary statistics for the resumés with known contact person names. In this sample, resumés are balanced across gender and other characteristics of applicants. However, compared to the main sample, industries are not balanced: Finance accounted for the majority of applications, followed by information technology and marketing.

### 4.3 | Descriptive results

Now we analyze the candidate selection process: Callback rates for applicants with different characteristics. Table 2 reports the main results. In line with the literature (Albert et al., 2011; Bertrand & Duflo, 2016; Gornall & Strebulaev, 2018) and results from our meta-estimates (Study 1), we find a favourable attitude towards female compared to male applicants, in the selection process based both on all resumés (Table 2 *Panel A*: risk ratio 1.48; Cohen's  $h = 0.11$ ) and resumés responding to advertisements that include the name of a contact person (Table 2 *Panel B*: risk ratio 1.47; Cohen's  $h = 0.14$ ).

It should be noted that the callback rate related to ads that include the name of a contact person is higher than the overall callback rate: 11% versus 6.95%.<sup>12</sup> We take this into account in the subsequent regression analysis.

More important, we find evidence of preferential treatment for members of the same gender as the recruiter contact. Table 2 *Panel B* shows that if the contact person is female, she is more likely to call back a female applicant (risk ratio: 1.89; Cohen's  $h = 0.21$ ), whereas if the contact is male there is a higher likelihood that a male applicant will be called for interview (risk ratio: 1.20; Cohen's  $h = 0.07$ ).<sup>13</sup> The more favourable treatment of members of the same gender is in line with the idea of in-group favouritism in experimental studies in the field of psychology (Balliet et al., 2014).

<sup>12</sup>If the name of the contact persons were given, it was automatically included in the cover letter. This personal, respectful approach could have increased the probability of callback.

<sup>13</sup>The pattern that female recruiters are more likely to contact female candidates holds if the data are broken down by the applicant's employment status: Self-employed (1.60) or a wage-earner (1.38).

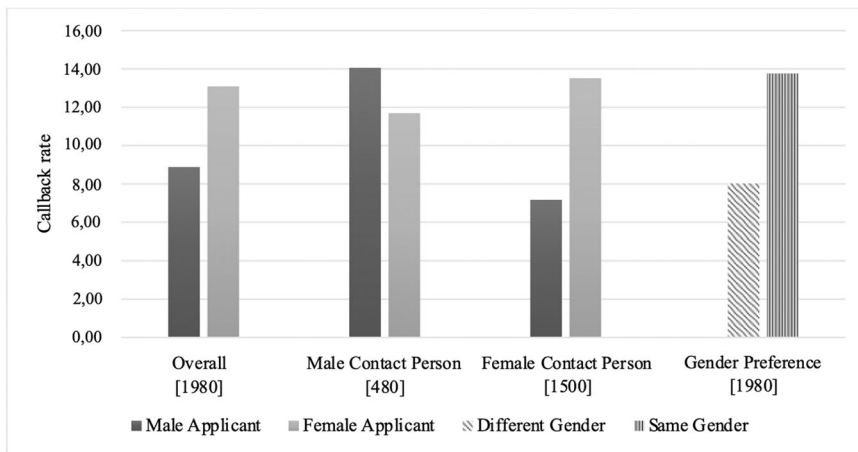


FIGURE 2 Gender preferences in callbacks

Figure 2 depicts the general pattern of the callback distribution based on the gender characteristics of the applicant and the contact person. It shows that male applicants generally receive fewer callbacks than their female counterparts (columns 1 and 2) and that when male candidates are called back, the contact person is more likely to be a male (columns 3 and 4). Similarly, female applicants more often receive a callback if the contact person is female (see columns 5 and 6). Figure 2 also shows the level of callbacks for candidates of the same gender as the contact and those of a different gender to the contact person (last two columns). About 63% of contact persons prefer to call applicants of the same gender as themselves with only 37% calling applicants of a different gender (risk ratio: 1.66; Cohen's  $h = 0.17$ ). We assess the significance of these results in the next section.

#### 4.4 | Econometric analysis

To analyze whether the above results are statistically significant, we use probit regression with robust standard errors clustered at the vacancy level. First, we simply assess the effect of gender on the probability of callback, for the main sample and the gendered samples:

$$\Pr(\text{Callback} = 1) = \Phi(\beta_0 + \beta_{\text{femApp}} T_{\text{femApp}} + c_i),$$

where *Callback* equals 1 if the recruiter responds via telephone or email,  $\Phi$  is the standard cumulative normal distribution,  $T_{\text{femApp}}$  equals 1 if the applicant is female, and  $c_i$  is the unobserved cluster effect of the vacancy  $i$ .

Table 3 reports the estimations. Columns (1) to (4) present the results of the gender effect on callback rates for the main sample (8328 resués). The regression analysis supports the descriptive results presented earlier. We see that candidate gender has a statistically significant effect on the probability of being called back [columns (1) and (2)].

TABLE 3 Callback rate according to gender and presence of contact person's name

	Dependent variable callback					
	Main sample				Sample with contact person's name present	
	(1)	(2)	(3)	(4)	(5)	(6)
Female applicant	0.204*** (0.048)	0.198*** (0.049)	0.209*** (0.048)	0.205*** (0.049)	0.226*** (0.087)	0.210** (0.090)
Presence of contact person's name			0.355*** (0.069)	0.334*** (0.074)		
Constant	-1.589*** (0.041)	-2.001* (1.041)	-1.694*** (0.047)	-2.091** (1.052)	-1.348*** (0.076)	-3.675** (1.851)
Number of Resumés	8328	8328	8328	8328	1980	1980
Controls	No	Yes	No	Yes	No	Yes

Note: Probit regressions. Robust-clustered standard errors at the vacancy level in parentheses. The vector of controls in columns (2), (4) and (6) includes previous work experience (wage-earner/self-employed), skill level of the position, applicant age, order of sending the application, whether the resumé includes an objective section, and industry-specific effects.

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

Table 3 column (1) shows that female applicants are treated more favourably at the selection stage compared to male job applicants. In column (2), we include regression estimates with a set of controls: Skill level of the position (high-skilled managers/lower-skilled associate professionals), applicant age, previous work experience (wage-earner/self-employed), order of sending the application, whether the resumé includes an objective section and industry-specific effects. The results are robust to the inclusion of these control variables.

The regressions in columns (3) and (4) include a dummy variable that equals 1 if the contact person name is given in the job advertisement. This is to check whether the gender effect holds for the main sample and sample with a contact person's name. The gender effect remains statistically significant and the inclusion of the dummy variable for presence of the name of the contact person does not change the point estimates.

Columns (5) and (6) report the results for the effect of gender on the callback rate for applications where we have the name of a contact person (sample size 1980 resumés). Again, the effect is statistically significant in this sample and the magnitude of the effect is similar to that in the main sample. That is, in both samples (with and without the contact person name) female candidates are more likely to receive a callback and, since we see that the magnitude of the gender effect does not change across samples, we would suggest that the samples are comparable.

We can now assess whether female candidates are more likely to get a callback if the contact person is female. We interact the randomly assigned female status ( $T_{femApp}$ ) with the dummy variable which equals 1 if the contact person is female ( $T_{femCP}$ ) and can write the general regression as:

$$\Pr(\text{Response} = 1) = \Phi(\beta_0 + \beta_{femApp} T_{femApp} + \beta_{femCP} T_{femCP} + \beta_{femApp \times femCP} T_{femApp} \times T_{femCP} + c_i)$$

Table 4 column (1) presents the regression results, which indicate that there is a higher possibility that the applicant will be called back if both an applicant and a contact person are of the same gender compared to if a contact person is of a different gender. If the contact person is female, the regression-based predicted probability of callback for the female applicant is 14% whereas for the male it is only 7%. If the contact person is male, the predicted probability of callback for the male applicant is 14%, but for the female it is only 12%. The results are robust to the inclusion of control variables such as previous work experience or skill-level of occupations and alternative specifications [see columns (2), (3) and (4)]. It is important to note that the statistical significance and the magnitude of the effect are unaffected by the inclusion of industry dummies [see columns (2) and (3)]. Thus, the effect seems robust to the inclusion of the industry dummies.

Finally, we assess the chances of both male and female applicants being called back by a contact person of the same gender. We constructed a dummy variable that equals 1 if the applicant's and the recruiter's contact genders coincide: *Applicant and Contact Person of the Same Gender*. Table 5 reports the results of this regression analysis. We find that applicants of the same gender as the contact person are statistically significantly more likely to receive a callback. The regression-based predicted probability of callback is 13% if the applicant is of the same gender as the contact person, but only 9% otherwise. That is, the probability of callback increases by four percentage points (44%) if the applicant and the contact person are of the same gender. The effect is robust to the inclusion of industry-specific effects and the control variables. This is evidence of gender-based in-group favouritism in the recruitment process.

TABLE 4 Callback rate for applications and contact person's name

	Dependent variable callback			
	(1)	(2)	(3)	(4)
Female applicant	-0.113 (0.160)	-0.167 (0.165)	-0.126 (0.159)	-0.140 (0.165)
Female contact person	-0.385** (0.167)	-0.428** (0.178)	-0.431** (0.169)	-0.379** (0.173)
Female applicant × Female contact person	0.474** (0.189)	0.529*** (0.193)	0.493*** (0.189)	0.493** (0.193)
Constant	-1.078*** (0.141)	-3.313* (1.864)	-1.113*** (0.151)	-2.676 (1.850)
Number of resumé	1980	1980	1980	1980
Controls	No	Yes	No	Yes
Industry fixed effect	No	Yes	Yes	No

Note: Probit regressions. Robust-clustered standard errors at vacancy level in parentheses. The vector of controls in columns (2) and (4) includes previous work experience (wage-earner/self-employed), skill level of the position, applicant age, order of sending the application, and whether the resumé includes an objective section. Columns (2) and (3) include controls for industry-fixed effects.

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .



**TABLE 5** Callback rate for applicants of the same gender as contact person

	<b>Dependent variable callback</b>			
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
Female applicant	0.107 (0.105)	0.091 (0.108)	0.101 (0.107)	0.079 (0.109)
Applicant and contact person of the same gender	0.240** (0.103)	0.251** (0.104)	0.251** (0.105)	0.270** (0.106)
Constant	-1.417*** (0.078)	-3.102* (1.838)	-1.494*** (0.088)	-3.803** (1.848)
Number of resumé	1980	1980	1980	1980
Controls	No	Yes	No	Yes
Industry fixed effect	No	No	Yes	Yes

*Note:* Probit regressions. Robust-clustered standard errors at vacancy level in parentheses. The vector of controls in columns (2) and (4) includes previous work experience (wage-earner/self-employed), skill level of the position, applicant age, order of sending the application, and whether the resumé includes an objective section. Columns (3) and (4) include controls for industry-fixed effects.

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

## 5 | CONCLUSION AND DISCUSSION

In this paper, we investigated the causal link between in-group gender favouritism and the gender imbalance in the labour market. We first systematically assessed the gender gap at the selection stage of the recruitment process using the meta-analysis. Next, we used data from a large correspondence study involving fictitious resumé sent in response to job advertisements to study callback rates. Since we randomly varied applicant gender, among other characteristics, we were able to investigate employers' attitudes to male and female candidates.

Our meta-analysis of previous correspondence studies shows that women are more likely to be invited for the interview. In line with this finding, we obtained evidence of favourable treatment of female candidates at the callback stage in our correspondence experiment. In the pooled sample for all occupations, women were more likely than men to be invited for an interview (ratio 1.48). This effect persists if we control for industry-specific effects and other applicant characteristics. We hypothesize that in-group favouritism drives this effect: Recruiters are more likely to send invitations to interviews to applicants of the same gender as themselves. We tested this hypothesis by exploiting a distinct feature of our data set—inclusion in the advertisement of the name of the contact person.

Most of the known contact persons in our sample, 75.8%, were women, in line with the prevalence of female human resources managers in other countries. More importantly, we found that female candidates were more likely to receive callbacks if the contact person was female, with the reverse holding true for male applicants, who were more likely to be invited for interview if the contact person was male. Finally, we identified a general pattern showing that applicants are more likely to receive callbacks if they are of the same gender as the contact person. Thus, our analysis provides evidence of gender group favouritism in the labour market. Given that most human resources staff are female, this might explain the favourable treatment of females at the selection stage of the recruitment process.

The limitation of this study is that not all companies provide the name of a recruiter contact person in job openings, so our sample included only applications for the job advertisements which contained the recruiter contact name. We found evidence of higher callback rates if the recruiter contact was named in the advertisement, compared to the full sample. However, the regression analysis shows a statistically significant effect of the gender gap in both samples; its effect size is almost the same in both samples and is robust to controlling for the presence of a contact person's name. Second, the sample of applications involving a recruiter's contact name shows an imbalance across the industries considered. However, the point estimates and the statistical significance of the main results remained unchanged when we controlled for industry-specific effects.

We observe the callback rate but not the ultimate hiring decision, where other processes can take place. Yet, the study aims to explain the paradoxical observation of favourable treatment of women on average at the selection stage of the recruitment process. Therefore, we assess the in-group favouritism at this stage and find support for this theory. In our sample, female candidates had a higher probability of being invited back by female recruiters, whereas male recruiters favoured male applicants. It should be noted that our study focuses on relatively high-skilled, well-paid jobs of associate professionals or managers. Thus, it would be interesting to see if positive female in-group bias is even more pronounced among low-skilled positions. Finally, more studies are needed to understand if the observed pattern of gender group favouritism in the labour market is generalizable across contexts and at subsequent stages of the recruitment process. For instance, one could study the same phenomena for the ultimate hiring decision, where the gender composition of decision makers is likely to be different, or in countries with a strong gender equality policy and in occupational fields where a clear gender policy is present.

In a nutshell, we show that women are more likely to be invited for the interview than men and find evidence of in-group favouritism that can explain this pattern, given that most human resources staff are female. While other theories—gender-based occupational segregation, differences in human capital, preferences, or personality traits across genders—can play a role, the evidence of in-group favouritism brings a rather positive message for tackling gender-based discrimination. Making recruiters' positions of various levels equally attractive for different genders will reduce gender-based bias at the selection stage of the recruitment process for other applicants. Organizations could devote resources to develop policies to encourage diverse groups of employees at different human resource management positions and, thus, foster equality of opportunities at the recruitment.

Moreover, our evidence helps to look at diversity training in a new light. Diversity training changes attitudes that are subject to demand effects or social desirability (see meta-analysis by Bezrukova et al., 2016), with limited evidence on changes in objective behavioural outcomes (Chang et al., 2019). The large experiment that relies on objective behavioural outcomes shows that diversity training does not, on average, change employee treatment of female new hires if measured with the help of the correspondence (audit) method (Chang et al., 2019). On the contrary, diversity training based on best practices in the field led female employees to favour speaking with a female new hire over a male new hire, which is not necessarily desirable in the presence of in-group favouritism. Thus, one can consider discussing in-group bias irrespective of gender in diversity training. More generally, the policy efforts to make the positions of different levels equally attractive for different genders is not only valuable by itself; it can also equalize opportunities in other work-related processes.

## ACKNOWLEDGMENTS

We are grateful to the editor, Peter Nolan, and the anonymous referee for thoughtful and valuable comments, which helped to improve the paper. Open Access funding enabled and organized by Projekt DEAL.

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**How to cite this article:** Asanov, I., & Mavlikeeva, M. (2023). Can group identity explain the gender gap in the recruitment process? *Industrial Relations Journal*, 54, 95–113. <https://doi.org/10.1111/irj.12392>