



# The effect of flatter hierarchy on applicant pool gender diversity: Evidence from experiments

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## Abstract

**Research Summary:** This article investigates how job seekers' perceptions of an employer's formal hierarchy affect the size and gender composition of its applicant pool. Building on the literature on gendered organizations and organizational design, we develop opposing perspectives on these relationships. To arbitrate between these perspectives, we first conduct a field experiment in partnership with a hiring firm. We find that featuring a flatter hierarchy in recruiting materials does not significantly affect the size of the applicant pool, but significantly decreases women's representation within it. Our follow-up survey experiment identifies several potential mechanisms (e.g., perceptions of career progression, informality, workload, and fit). Our findings imply that firms' growing tendency to adopt flatter hierarchies could inadvertently undermine efforts to attract a greater proportion of women applicants.

**Managerial Summary:** Using a pair of labor market experiments, this study finds that characterizing a hiring firm's hierarchy as "flatter" with fewer management levels reduces women's representation in the applicant pool. We show that this decrease in the share of women

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applicants is likely driven by the fact that women, compared to men, perceive flatter hierarchies as more likely to present difficulties in fitting in, burden them with more work, and provide fewer opportunities for career progression. These findings suggest that, to mitigate workplace gender segregation, organizations with flatter structures may benefit from de-emphasizing their organizational hierarchies in recruitment efforts. Moreover, companies should consider how their organizational attributes contribute to fostering a more inclusive work environment.

#### KEY WORDS

gender, hierarchy, labor market, organizational structure, sorting

## 1 | INTRODUCTION

Women remain chronically underrepresented in many labor market contexts (Engel et al., 2023; Fernandez & Campero, 2017; Murciano-Goroff, 2022; Phillips, 2005). As the likelihood of an employer hiring a woman is typically proportional to women's representation in its applicant pool (Fernandez & Abraham, 2011; Fernandez-Mateo & Fernandez, 2016; Petersen et al., 2000), the literature on gender-based labor market segregation has considered various recruitment strategies whereby employers might ameliorate this underrepresentation by increasing the share of women applicants. In particular, prior research illustrates that employers can augment women's representation by highlighting specific organizational characteristics that women job seekers, compared to men, find disproportionately attractive, such as evidence of promoting women and commitments to diversity or social causes (Abraham & Burbano, 2022; Flory et al., 2019; Wiswall & Zafar, 2018).

In this article, we examine how women's representation in an employer's applicant pool may be shaped by its formal hierarchy, which is a fundamental feature of all formal organizations that is represented by the number of management levels (Burton & Obel, 2004; Puranam, 2018; Simon, 1997). Although the extensive literature on organizational design has investigated how a firm's hierarchical structure shapes the day-to-day experiences and long-term career progression of employees *within* the firm (e.g., Acker, 1990; Baron, 1984; Lee & Edmondson, 2017), little research has examined how its hierarchical structure may be perceived by job seekers and thus affect their propensity to apply to the firm in the first place—let alone, whether this propensity varies by gender. Understanding the relationship between an employer's hierarchical structure and its applicant pool is theoretically as well as phenomenologically important, given that employers commonly reference their hierarchical structures in their recruiting efforts, as we document in Figure 1.

To examine this relationship, we draw upon prior literature on gendered organizations and organizational design to develop opposing perspectives regarding how job seekers perceive an employer's organizational structure and how these perceptions shape their inclination to apply. We first discuss the perspective that job seekers may be more attracted to a *flatter* hierarchy with fewer management levels, because they may perceive this organizational structure to



satisfy a need for autonomy and flexibility and to act as “an egalitarian alternative” to traditional, taller hierarchies (Foss & Klein, 2014, p. 73, Oldham & Hackman, 1981, Reitzig, 2022). This attraction, moreover, may be disproportionately stronger among women job seekers inasmuch as prior research argues they may perceive traditional, taller hierarchies as perpetuating men’s advantage (Acker, 1990; Ferguson, 1984) and serving as “an important location of male dominance” (Acker, 1990, p. 139) with “masculine principles dominating their authority structures” (Kanter, 1977, p. 46). If women tend to hold this negative perception of taller hierarchies and/or if they disproportionately value autonomy, flexibility, and egalitarian work environments (Barbulescu & Bidwell, 2013; Bartling et al., 2014; Deci & Ryan, 2000), they may be relatively more attracted than men to flatter employers.

We then elaborate the opposing perspective that job seekers may be more attracted to a *taller* hierarchy with more management levels. For one, job seekers may perceive that, because these organizational structures clarify responsibilities and facilitate accountability (Lee, 2022; Puranam, 2018; Tetlock, 1985), taller hierarchies are more likely than flatter hierarchies to satisfy their unconscious need for order and stability (Friesen et al., 2014; Fromm, 1941; Tiedens et al., 2007) and equitable rewards distribution (Gruenfeld & Tiedens, 2010; Halevy et al., 2011). Moreover, they may perceive taller organizational structures as more likely to fulfill their desire for career progression by offering more opportunities for promotion (Baron et al., 1986; Murray, 1938). In contrast, job seekers may be repelled by the perceptions that flatter employers provide fewer promotional opportunities and that this scarcity will result in more intense competition and conflict (Baron et al., 1986; Flory et al., 2015). This perception may be stronger among women job seekers, who are, compared to men, less likely to prefer or succeed in workplaces with intense competition and conflict (Barrymore et al., 2022; Flory et al., 2015; Niederle & Vesterlund, 2011). More generally, women may be disproportionately disinclined to apply to flatter employers if they perceive these structures as having less managerial oversight and cultivating informal “bro cultures” that marginalize women (Chang, 2018; Kanter, 1977).

We evaluate these opposing perspectives by conducting a pair of experiments in the context of the US labor market. First, partnering with a US healthcare startup, we ran a preregistered large-scale field experiment, in which we manipulated 8167 job seekers’ perceptions of the hiring firm’s hierarchical structure. We find that characterizing the firm’s organizational structure as “flatter” in its recruiting efforts has, on average, no statistically discernible effect on job seekers’ propensity to show interest in or apply to the open position. However, we find that, compared to men, women job seekers are less likely to show interest in or apply to a flatter employer. More specifically, characterizing our partner firm’s organizational structure as “flatter” reduces the proportion of interested women job seekers by 14% and lowers the share of women applicants by 28%. To replicate this finding and explore the underlying mechanisms, we conducted a preregistered large-scale survey experiment of 8498 subjects where we measure how an employer’s hierarchy shapes job seekers’ attraction and their perceptions of a wide range of organizational characteristics. We again find that, compared to men, women are less attracted to flatter hierarchies. In addition, we find that this relative aversion may reflect the fact that, compared to men, women perceive flatter structures to (1) offer less opportunity for career advancement, (2) burden them with more work, and (3) be more difficult to fit into.

Our study makes several contributions. First, we advance the literature on labor market sorting and segregation by gender by addressing recent calls to examine how cross-gender differences in perceptions of organizational traits may lead women and men to sort into different employers (Fernandez-Mateo & Kaplan, 2018, p. 1229). We do so by investigating how women and men job seekers differ in their perceptions of and preferences for formal hierarchy and,

consequently, how they vary in their propensity to supply their labor to employers with different hierarchical structures. Though our results confirm Acker's (1990) insight that "organizational structure is not gender-neutral" (p. 139), we challenge the idea that enhancing women's representation will be achieved by creating "nonhierarchical, egalitarian organizations" (p. 141). Second, we contribute to the literature on organizational design by unveiling how perceptions of a firm's formal hierarchy affect its human capital acquisition. To date, this literature has mainly focused on how hierarchical structure motivates and coordinates existing employees (for reviews, see Burton & Obel, 2004, Oldham & Hackman, 1981, Puranam, 2018), neglecting its effects on attracting new employees. We demonstrate that flatter organizations may not only fail to attract more applicants but also decrease gender diversity in the applicant pool. Third, by examining our question in the context of a high-growth startup, we speak to the ongoing debate regarding the appropriate organizational structure for new ventures. In contrast to received wisdom in entrepreneurship research that startups should have flatter hierarchies (Burns & Stalker, 1961), we find startups with flatter hierarchies may struggle to attract a gender-diverse applicant pool. Finally, we answer recent calls to elucidate the selection processes underlying entrepreneurial team formation (Shah et al., 2019) by assessing how individuals self-select into an entrepreneurial venture based on their perceptions of its formal hierarchy.

## 2 | BACKGROUND LITERATURE

### 2.1 | Labor market sorting by gender

Given the persistent underrepresentation of women in many labor market contexts (Bielby & Baron, 1986; Fernandez & Campero, 2017; Murciano-Goroff, 2022; Petersen & Morgan, 1995; Reskin, 1993; Reskin & Padavic, 1994), a rich stream of research has explored why women and men may systematically sort into different employers (Blau et al., 1998; Blau & Hendricks, 1979; Phillips, 2005). These studies have primarily taken one of two perspectives to explain gender segregation (Fernandez & Sosa, 2005; Fernandez-Mateo & Kaplan, 2018). One perspective focuses on the characteristics of job seekers (i.e., the supply-side of the labor market); that is, how men and women job seekers could have different skills and preferences which cause them to select into different employers (Barbulescu & Bidwell, 2013; Wiswall & Zafar, 2018). The other perspective, in contrast, centers on the attributes of employers (i.e., the demand-side of the labor market): how employers' gender-biased or discriminatory characteristics (in particular, processes of employee selection, promotion, and retention) could prevent women from entering or remaining in certain firms (Bielby & Baron, 1986; Perry et al., 1994; Reskin & Roos, 1990).

This study takes up recent calls to move beyond this dichotomy (Fernandez-Mateo & Kaplan, 2018) by investigating how women and men job seekers differ in how they *perceive* employers' demand-side characteristics (i.e., organizational traits) and how these differences in *perceptions* affect their selection into applicant pools. As Barbulescu and Bidwell (2013, p. 741) point out, this approach to understanding gender-based labor market segregation "lies at the intersection of supply and demand: although segregation is engendered by workers' application decisions, those decisions anticipate the expected behavior of employers." This integrated approach better accounts for the reality that women workers are often in very high demand, especially among firms and industries in which they are least represented (Lambrecht & Tucker, 2019).



From this integrative perspective, underrepresentation of women often arises because women job seekers perceive a greater likelihood of career-limiting gender bias based on certain organizational characteristics, such as an employer's leaders (e.g., their gender, political ideology, organizational blueprint; Campero & Kacperczyk, 2020, Carnahan & Greenwood, 2018, Phillips, 2005), recruiting activities (e.g., the use of gendered language in its job postings; Castilla & Rho, 2023, Gaucher et al., 2011), work arrangements (e.g., work-life balance, team-based work structures; Barbulescu & Bidwell, 2013, Kalev, 2009, Mas & Pallais, 2017, Wiswall & Zafar, 2018), reward systems (e.g., meritocracy, pay formalization; Abraham, 2017, Castilla, 2008), and even third-party resource providers (Abraham, 2020). As job seekers have limited information about potential employers, they perceive these organizational characteristics through various means, such as job ads, online reviews, and conversations with current employees (DeVaro, 2005; Dineen & Allen, 2016). Job ads play a particularly important role in shaping workers' perceptions of the firm (Barber & Roehling, 1993) because they not only provide detailed information about the employer and the open position but also commonly serve as the online location through which job seekers submit their applications. Accordingly, firms can curate job ads with the goal that they will be perceived more favorably by women and thus attract an applicant pool with a greater share of women (Abraham & Burbano, 2022; Castilla & Rho, 2023; Mihaljević et al., 2022).

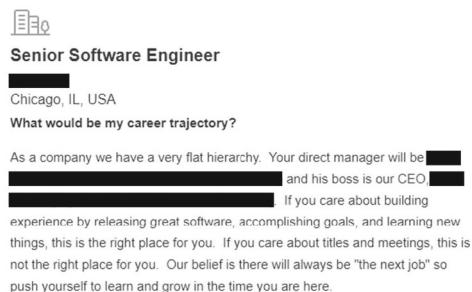
## 2.2 | Formal hierarchy

Taking the integrative perspective on workplace gender segregation, we examine how men and women job seekers perceive an employer's formal hierarchy and how these perceptions may affect their decision to apply. The literature on organizational design defines formal hierarchy as the vertical division of tasks represented by the layers of management in an organization (Burton & Obel, 2004, pp. 75–77, Puranam, 2018, pp. 106–126, Simon, 1997, p. 7). By adding managerial levels and dividing decision-making responsibilities across these levels, taller hierarchical structures reduce the number of subordinates that each manager directly supervises (Csaszar, 2021; Graicunas, 1937). This smaller span of control allows boundedly rational managers to pay more attention to each of their subordinates, better integrate and evaluate the efforts of their subordinates, and resolve conflicts among them (Lee, 2022, Puranam, 2018, p. 113). By fostering coordination, these multilayered structures can establish order and stability within the organization (Simon, 1997; Tetlock, 1985).

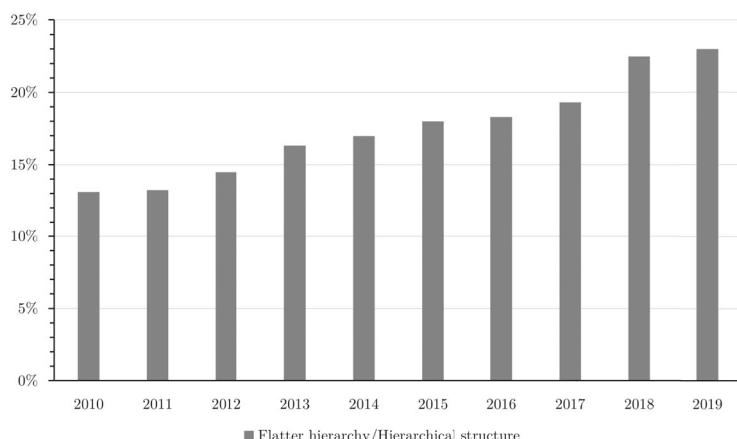
In contrast, by removing managerial layers, flatter hierarchies reduce status differentiation, increase the span of control of managers, and distribute more decision-making responsibilities to their subordinates (Csaszar, 2021; Graicunas, 1937; Lee, 2022). As subordinates are each subject to less managerial supervision and are more empowered in flatter organizations, they can enjoy more autonomy and flexibility in allocating their efforts toward tasks that they perceive to match their skills and/or to be more meaningful (Oldham & Hackman, 1981, Reitzig, 2022, Saxenian, 1996, p. 76). This increased autonomy and flexibility, along with less status differentiation, can help create a sense of fairness and “egalitarian” culture (Foss & Klein, 2014, p. 73), where employees recognize each other as equals (Siegel et al., 2013, p. 1174) and more freely voice their opinions (Keum & See, 2017).

As formal hierarchy is such a fundamental feature of all organizations (Blau & Scott, 2003; Burton & Obel, 2004; Puranam, 2018; Simon, 1997), employers commonly highlight their hierarchical structures in their job postings. For example, panel (a) of Figure 1 displays a recent job

(a) An example of a job posting that highlights a flatter organizational structure with fewer management layers. In this example, the names of the company, the CEO, and the direct manager are redacted.

  
**Senior Software Engineer**  
 [REDACTED]  
 Chicago, IL, USA  
**What would be my career trajectory?**  
 As a company we have a very flat hierarchy. Your direct manager will be [REDACTED] and his boss is our CEO [REDACTED]. If you care about building experience by releasing great software, accomplishing goals, and learning new things, this is the right place for you. If you care about titles and meetings, this is not the right place for you. Our belief is there will always be "the next job" so push yourself to learn and grow in the time you are here.

(b) The growing trend of companies highlighting their flatter hierarchies in their job postings. This figure illustrates the share of companies that specifically mention “flatter hierarchy” among those that reference their hierarchical structure in their job postings.<sup>a</sup>



**FIGURE 1** Featuring a flatter hierarchical structure in recruiting efforts.

<sup>a</sup>The observations in panel (b) are 6,424,963 firms, which posted a total of 156,705,625 jobs in the U.S. between 2010 and 2019. This sample was collected from Burning Glass Technologies, which provides a representative dataset of U.S. job postings (Cammeraat and Squicciarini 2021, Lee and Kim 2022). To assess whether a firm’s job posting features its hierarchical structure, we used the following list of phrases: “chain of command,” “company hierarch\*,” “corporate hierarch\*,” “firm hierarch\*,” “flat\* hierarch\*,” “flat\* manag\*,” “flat\* organi\*,” “flat\* structur\*,” “flatland,” “formal hierarch\*,” “hierarchical organi\*,” “hierarchical structur\*,” “holacracy,” “layer\* of manag\*,” “level\* of manag\*,” “manag\* layer\*,” “manag\* level\*,” “no bosses,” “no managers,” “no middle manag\*,” “non-hierarchical,” “org\* hierarch\*,” “org\* structur\*,” “self-manag\*,” “self-organi\*,” “tall\* organi\*,” and “tall\* structur\*,” where the asterisk (\*) represents a meta-character for one or more instances of any alphabet letters. Among these phrases, those containing the word “flat” (e.g., “flat\* hierarch\*”) or their equivalent terms (i.e., “holacracy,” “no bosses,” “no middle manag\*,” “non-hierarchical,” “self-manag\*,” “self-organi\*”; Foss and Klein 2022, Lee and Edmondson 2017, Lee 2022, Reitzig 2022) were used to identify job postings specifically mentioning a flatter hierarchy. As this “flatter hierarchy” category does not include terms with “level” or “layer” (i.e., “layer\* of manag\*,” “level\* of manag\*,” “manag\* layer\*,” and “manag\* level\*”), it does not capture job postings mentioning that the company, for example, has “very few layers of management.” Thus, this category is likely to represent a conservative estimate for the proportion of firms highlighting their flatter hierarchies. For separate analyses of (1) the share of firms referencing their hierarchical structure and (2) the share of firms specifically mentioning flatter hierarchy, see Appendix A1.



posting in which the employer underscores its “very flat hierarchy” with two managerial levels. We document the prevalence of such job postings by assessing the word occurrence of terms related to formal hierarchy (e.g., “hierarchical structure”; for more detail, see the footnote in panel (b)) in roughly 157 million job postings from more than 6 million employers in the United States between 2010 and 2019. Panel (b) shows that, among employers that mentioned their hierarchical structures in their job postings, the share of those that specifically mention a flatter organizational structure has roughly doubled. In line with this growing trend, flatter hierarchies have increasingly gained attention from academics and practitioners (e.g., Foss & Klein, 2022; Lee, 2022; Lee & Edmondson, 2017; Puranam & Håkonsson, 2015; Reitzig, 2022).

Despite this heightened scholarly interest, little research has investigated how formal hierarchy affects applicant attraction. To address this gap, we develop opposing perspectives regarding how organizational structure may shape the size and gender composition of the applicant pool. In the following two sections, we first elaborate how job seekers, on average, may perceive a firm's hierarchical structure and then outline how these perceptions may vary by gender.<sup>1</sup>

### 2.3 | How perceptions of hierarchy may affect the size of the applicant pool

On the one hand, job seekers may generally prefer *flatter* employers. By imposing fewer layers of management, flatter organizations decrease managerial oversight and status differentiation, while increasing autonomy and flexibility (Oldham & Hackman, 1981, Lee, 2022, Saxenian, 1996, p. 76). Although individual preferences vary, a growing body of work suggests that workers, on average, desire and value autonomy and flexibility in the workplace (Bartling et al., 2014; Deci & Ryan, 2000; Spector, 1986). These attributes enable workers to experiment and direct their efforts toward tasks that they perceive to be more meaningful (Keum & See, 2017; Lee, 2022; Lee & Edmondson, 2017). In addition, job seekers may perceive flatter employers as more fair and egalitarian because they reduce status differentiation among employees, distribute power more evenly, and ameliorate in-group biases (Foss & Klein, 2014, p. 73, Puranam, 2018, Reitzig & Sorenson, 2013). These perceptions potentially cause *flatter* organizations to attract more applicants.

On the other hand, job seekers may prefer *taller* employers. By adding managerial levels, taller hierarchies reduce the number of subordinates that each manager directly supervises (Csaszar, 2021; Graicunas, 1937), thereby clarifying responsibilities and facilitating accountability (Puranam, 2018, p. 113, Tetlock, 1985). Job seekers may perceive that these clearly defined roles, responsibilities, and accountability satisfy their unconscious need for order and stability (Friesen et al., 2014; Fromm, 1941; Tiedens et al., 2007). Furthermore, because more hierarchical levels represent more opportunities for promotion and career progression (Baron et al., 1986), job seekers may anticipate that taller organizations are more likely to fulfill their desire for career advancement (Murray, 1938). In addition, because fewer subordinates are vying for the attention of each manager who makes promotion decisions (Halac & Prat, 2016), job seekers may anticipate taller employers as being less competitive, a feature that candidates tend to prefer (Flory et al., 2015). Finally, because the smaller span of control makes it easier for managers to evaluate and distribute rewards based on employees' efforts and contributions,

<sup>1</sup>It is important to note that, because job seekers typically have imperfect information about their potential employers, their perceptions of flatter or taller employers may not accurately reflect the reality of these organizations.

rather than rationing those rewards equally, job seekers may perceive taller structures to be more equitable (Gruenfeld & Tiedens, 2010; Halevy et al., 2011). Given these perceptions, *taller* organizations may attract more applicants.

## 2.4 | How perceptions of hierarchy may affect the gender composition of the applicant pool

In the previous section, we discussed how job seekers may, on average, be more or less attracted to flatter hierarchies. However, prior work has shown that women and men often differ in their perceptions of various organizational characteristics (Barbulescu & Bidwell, 2013; Croson & Gneezy, 2009; Wiswall & Zafar, 2018). If women and men job seekers also differ in their perceptions of an employer's formal hierarchy, these differences likely shape the gender composition of the employer's applicant pool. Hence, we theorize how perceptions of formal hierarchy may vary by gender and how this variation may lead to systemic differences in the gender composition of the employer's applicant pool.

Compared to men, women may be *more* attracted to flatter employers than taller ones because they perceive flatter hierarchies as ameliorating the gender biases they perceive as inherent to taller hierarchies. Feminist scholars have characterized taller hierarchies as a “scientific organization of inequality” (Ferguson, 1984, p. 7) which creates “a veneer of fairness” (Nicholson, 2010), conceals “a gendered substructure” (Acker, 1990, p. 154), and reinforces patriarchal power structures (Reskin, 1988). From this perspective, taller structures impose narrow criteria for career progression which do not account for the societal expectations that women should tend to domestic responsibilities (Glass & Estes, 1997; Nelson & Bridges, 1999). Thus, relative to men, women may be concerned that in taller organizations, they will be forced to choose between fulfilling domestic responsibilities *or* pursuing professional goals (Glass & Estes, 1997). In contrast, women may expect that, by removing managerial layers that calcify gendered assumptions, flatter employers will provide more autonomy and flexibility that allow them to balance these responsibilities. Accordingly, prior studies have shown that women are more likely to apply to jobs offering flexibility regarding when and where the job is performed (He et al., 2021) and that, compared to men, they are willing to give up seven times more salary for such flexibility (Wiswall & Zafar, 2018). In addition to flexibility and autonomy, women may perceive flatter organizations as more egalitarian work environments where they are more likely to be treated fairly and succeed. In this regard, Ridgeway (2011, p. 175) argues that flatter hierarchies benefit women “who seek equal outcomes with their male colleagues” because they offer more equal access to resources and opportunities while allowing them to avoid “bad actors” with biased perceptions and agendas. Supporting this argument, prior studies find that women are more likely to prefer equality and egalitarianism, whereas men tend to prefer when rewards are allocated according to individual contributions (Brockner & Adsit, 1986; Kahn et al., 1980).

Contrary to this perspective, however, women may be *less* inclined than men to apply to flatter employers due to the perception that less clear roles, responsibilities, and accountability in these organizations will enable the emergence of a male-dominated work environment. In this vein, Kanter (1977) and Chang (2018) characterize the work environment in flatter organizations as “old boys' clubs” or “bro cultures.” Furthermore, large-scale surveys (e.g., Vassallo et al., 2017) and numerous firsthand accounts from women who have worked for flatter employers (e.g., Diamond, 2019; Finley, 2014; Flower Horne, 2014; Hamburger, 2021; Hunt, 2017; Mont, 2017) illustrate how men in this environment can saddle women with more



work, especially lower value, less-interesting tasks that are unlikely to lead to promotion (e.g., cleaning, note-taking, food delivery). As one explains:

People, by nature, surround themselves with like-minded—and like-cultured—individuals, creating echo chambers and consolidating power in in-groups. This almost always puts women and minorities at a disadvantage. In a structured organization, formal policies on hiring and process can help to prevent the biases and inequalities that come from such in-groups, but a flat organization has no such defense from becoming a good ol' boys club. ... In flat organizations, it's very common for many of the extra tasks to be assigned to women and minorities first (Hunt, 2017).

In addition to the work environment, the perception of greater competition for fewer promotions may be disproportionately unattractive to women, who often fare worse in and seek to avoid competition (Barrymore et al., 2022; Flory et al., 2015; Niederle & Vesterlund, 2011) partly because, compared to men, they tend to undervalue their work and avoid self-promotion (Babcock & Laschever, 2009; Exley & Kessler, 2019; Lerchenmueller et al., 2019). In contrast, by delineating more hierarchical levels, reducing each manager's span of control, and clarifying roles and responsibilities, taller organizations can reduce competition over promotion and managerial recognition. Thus, women job seekers may perceive taller hierarchies as a “great leveler” that safeguards against marginalization (Baron et al., 2007, p. 38).

## 2.5 | Theoretical summary

In outlining these contrasting perspectives, we highlight important theoretical and practical tension. On the one hand, job seekers may prefer to work for *flatter* employers because they perceive that these firms offer more autonomy, flexibility, and egalitarian work environments than their taller counterparts. Because women tend to value these characteristics more than men, flatter organizations may be disproportionately attractive to women job seekers. On the other hand, job seekers may find *taller* employers more attractive because they perceive these organizations to provide more clarity about roles and responsibilities, more equitable treatment, and more opportunities for career advancement. If women expect these attributes of taller hierarchies to reduce competition and shield them from an informal “bro culture,” they may be especially attracted to taller hierarchies. In what follows, we empirically adjudicate between these opposing perspectives.

## 3 | METHODOLOGICAL APPROACH

To identify the effect of an employer's formal hierarchy on its applicant pool, we implement two complementary labor market experiments, both of which were approved by the Institutional Review Board and preregistered.<sup>2</sup> In each pre-analyses plan, we specify the data

<sup>2</sup>The pre-analysis plan for Study 1 is available at: [https://osf.io/8qdu4/?view\\_only=a78682025f57499b877c09ab7c68a34b](https://osf.io/8qdu4/?view_only=a78682025f57499b877c09ab7c68a34b). For Study 2, see: [https://osf.io/cyztj/?view\\_only=edd2a7da9fb54261a8c16973df6c1774](https://osf.io/cyztj/?view_only=edd2a7da9fb54261a8c16973df6c1774).

collection process, the randomized manipulation, the variables of interest and their measurement, and specific empirical specifications. First, partnering with a US healthcare startup, we run a field experiment to identify our effects of interest in a context with high external validity. Second, as it is difficult to measure mechanisms in the field experiment (Chatterji et al., 2016), we conduct a follow-up survey experiment to explore mechanisms as well as replicate our field-study findings.

## 4 | STUDY 1: FIELD EXPERIMENT

### 4.1 | Sampling

For our field experiment, we partnered with a US healthcare startup, which allowed us to recruit for two positions: a Software Engineer (SW) and a Business Development Representative (BD).<sup>3</sup> For these positions, we identified a pool of job candidates on ZipRecruiter, a widely used online job search platform. Using this platform's search function, we found candidates who had updated their profiles within the last 30 days and completed at least a bachelor's degree. For the SW position, we limited our search to candidates who included "software engineer" in their past or current job titles and indicated "Healthcare" or "Engineering" as their areas of interest. For the BD position, we limited the search to those who included "BD" in their past or current job titles and indicated "Healthcare" or "Sales and Biz Dev" as their areas of interest. After applying these criteria, we gathered the first 4200 individuals returned in each search (sorted by the date they last updated their profile) and thus identified a total of 8400 job seekers.<sup>4</sup>

To estimate the sample size needed to detect a meaningful effect at the 95% confidence level and a power level of 0.8, we conducted a pilot study with 100 subjects (i.e., 50 subjects per condition) and used the R package DeclareDesign (Blair et al., 2019). This analysis indicated a sample size of over 8000 subjects. Such a large sample size was required because this study measures real-world behaviors that subjects are generally disinclined to do: that is, opening and comprehending an email from an unfamiliar source (i.e., our partner startup), clicking on a hyperlink to a job ad in the email, and actually applying to the startup.

### 4.2 | Experimental manipulation

As in previous reverse audit studies (e.g., Abraham & Burbano, 2022; Flory et al., 2019), we embedded our experimental manipulation in the emails that we sent once to each of the 8400 potential applicants. These emails consisted of four paragraphs (see Figure A2 in Appendix A2). The email's second paragraph featured the randomized manipulation, which was included for the treatment group (i.e., *Flatter* condition) but excluded for the control group (i.e., No

<sup>3</sup>We chose these positions because either position, alone, did not offer enough qualified candidates on ZipRecruiter to achieve our target sample size and because both positions are common in many industries. In a post hoc analysis, we found no evidence of a difference in the main or interaction effects between the two positions.

<sup>4</sup>We did not select an equal number of women and men from ZipRecruiter's search results for two reasons. First, ZipRecruiter does not specify job seekers' gender, presumably due to a conscious decision to mitigate gender discrimination by employers. Second, oversampling on one gender to achieve gender balance would introduce other omitted variables. For example, if the pool of qualified candidates contains more women, oversampling candidates who are men would likely result in a sample of men and women who differ in terms of qualifications.



*Information* condition). Adapting the job posting in panel (a) of Figure 1, this manipulation stated that the company has “a flat organizational structure” with “fewer levels of management than similarly sized startups in our industry.” This statement was intended to reduce the number of hierarchical levels that subjects perceived the firm to have, without introducing other confounding characteristics.

The control condition for the *Flatter* treatment could have been operationalized in several other ways. One approach would have been to describe a *taller* hierarchy with “more management levels than similarly sized startups in our industry.” But, this approach is problematic because firms rarely state such a description in their job postings (i.e., 0.0003% of companies in our analysis for Figure 1) and thus subjects may have negatively responded to the abnormality of the statement. Another approach would have been to use an “inert” organizational description of a similar length that did not reference formal hierarchy. However, any description of the organization may have not been perceived as inert, and instead may have had an unintended direct effect on the participant’s attraction to the employer. For these reasons, we elected to use a control condition that made no mention of the hierarchical structure. We address the concerns that our treatment effects may have been driven by the difference in lengths of the treatment or the mere mention of hierarchy in Study 2 (see Section 5.7), where we demonstrate that the *Flatter* condition is, in fact, perceived by subjects to have fewer levels of management than the *No Information* condition. The follow-up experiment also includes a *Taller* condition to rule out the explanation that our results are driven by the mere mention of the organization’s hierarchy.

The remaining paragraphs were identical for both treatment and control groups. In the first paragraph, we invited job seekers to apply for one of the positions. We designed the third paragraph to make sure job seekers in both conditions had the same perceptions of the firm’s founding year, number of employees, and intention to grow. We took this measure in light of prior research suggesting that organizations with flatter hierarchies may be perceived as exceptionally young (Stinchcombe, 1965), small (Burton & Obel, 2004, p. 168), or have no intention to grow (Lee & Kim, 2022). The last paragraph included a hyperlink to the partner company’s application web page, which subjects were invited to visit if they were interested in applying. This web page featured the actual job posting that was identical for all subjects for a given job, regardless of their assigned treatment conditions. The actual job posting did not mention the employer’s organizational structure.

The success of this field experiment depended on job seekers receiving and opening the emails we sent. To maximize delivery rates, we used the mass-email delivery service Mailgun.com, which more than 225 thousand businesses employ for their mass-email marketing. Using this service, we sent an email once to each subject, tracked whether the email was successfully delivered, and removed from the sample 136 subjects that did not receive the email. Among the remaining 8264 email recipients, some subjects could have decided not to open our emails under any circumstance (i.e., “never-takers”; Angrist & Pischke, 2008, p. 158). However, because subjects decide whether to open the email before observing the randomized treatment (which is embedded in the body of the email and thus unobservable before opening the email), noncompliance should be unrelated to treatment status.<sup>5</sup> Technically, because we cannot remove never-takers, we estimate an “intention-to-treat” effect (ITT; i.e., the effect of being sent the email characterizing the employer as flatter), rather than the “average treatment effect”

<sup>5</sup>This noncompliance could also affect our analysis of heterogeneous effects by gender if women and men vary in their behavior of reading emails. However, in a large-scale study of more than two million users exchanging 16 billion emails, Koot et al. (2015) find no significant variation in email behavior by gender.



(ATE; i.e., the effect of actually perceiving the employer as flatter). Because the never-takers will never show interest in or apply to the job, the ITT is smaller in magnitude than the ATE. Hence, our field experiment represents a conservative approach to estimating our theorized relationship.

## 4.3 | Measurement

### 4.3.1 | Dependent variables

We measured job seekers' attraction to the partner firm in two ways. First,  $Click_i$  captures whether subject  $i$  clicked the hyperlink, embedded at the bottom of the email, to the partner company's application web page.<sup>6</sup> We used this measure for two main reasons. First, because the treatment and the hyperlink are both embedded in the email, visiting the application website is the first behavioral outcome that we can observe in terms of the subject's attraction.<sup>7</sup> Second, this outcome is unlikely to be affected by other information about the company, which subjects may observe after visiting the company's application web page but before deciding whether to apply. Despite these two benefits, this measure may not accurately reflect a subject's interest in applying to the company. For example, even if they are not interested, subjects in the *Flatter* condition might click on the hyperlink because they are simply curious to learn about a flatter organization. To address this concern, we also measure  $Apply_i$ , which indicates whether subject  $i$  submitted an application via our partner company's web page.<sup>8</sup>

### 4.3.2 | Independent variable

Our treatment variable  $Flatter_i$  captures whether subject  $i$  received an email stating that the organization's hierarchy is flatter than its competitors' (see Figure A2).

### 4.3.3 | Individual attributes

As ZipRecruiter does not collect information on job seekers' gender (presumably to reduce gender discrimination by employers), we employed the website Gender API's machine-learning algorithm, which used subjects' full name to predict their gender ( $Woman_i$ ).<sup>9</sup> In addition, to

<sup>6</sup>To identify who clicked the hyperlink, each subject's hyperlink included a unique URL with an identifier. Thus, when measuring  $Click$ , we were able to include the subjects who copied and pasted its URL into a browser, instead of clicking on the hyperlink in the email. All of the hyperlinks were directed to the same web page, regardless of the assigned treatment condition.

<sup>7</sup>Slough (2023) shows that, when one behavioral outcome depends on a previous action (e.g., voting depends on registering to vote, or applying to a job depends on clicking a link), the average treatment effects for subsequent actions are not identified due to "phantom" counterfactuals.

<sup>8</sup>We preregistered  $Apply$  as an *exploratory* outcome because, before running the experiment, the partner company could not guarantee our access to applications.

<sup>9</sup>According to its website, Gender API has a database of more than six million names in 189 countries. In an independent study, Sebo (2021) finds that its machine-learning algorithm is one of the two most accurate tools to predict binary gender based on full names (with a misclassification rate of only 1.8%).



compare the effect of *Flatter* within (but not between) jobs, we added a binary variable ( $Software_i$ ) for whether the subject was invited to the SW position as opposed to the BD position. To assess whether our randomization procedures achieved a balance between the treatment and control groups, we also measured job seekers' characteristics using self-reported information on ZipRecruiter. These attributes include the subjects' years of work experience, most recent job title, most recent employer, highest level of education (i.e., undergraduate, master's, or doctorate), and undergraduate institution.

#### 4.4 | Summary statistics and randomization balance

Among the 8400 emails we sent to the job seekers, 136 were not delivered because these emails were blocked by the subjects' email servers. In addition, Gender API's algorithm was unable to predict the gender of 97 job seekers.<sup>10</sup> Thus, our final sample was 8167 job seekers. The first column of Table 1 shows the summary statistics across all subjects.<sup>11</sup> Of these 8167 subjects, 28.5% showed interest in the open positions by clicking on the hyperlink, while 9.7% applied. Approximately 26.9% of the subjects were women, and 31.8% held a managerial position in their most recent job. In terms of the highest level of education, 35.8% had a master's degree, while 1.7% had completed a doctorate. In turn, the second and third columns provide the summary statistics by treatment condition. The differences in observable characteristics of candidates between conditions are small and indistinguishable from zero, suggesting that randomization was successful and that our estimates can be interpreted as causal. Finally, the fourth and fifth columns show the summary statistics by position.

#### 4.5 | Estimation

To assess the effect of a flatter hierarchy on attraction, we estimate the preregistered equation:

$$Attraction_i = \beta_0 + \beta_1 Flatter_i + \beta_2 Software_i + \varepsilon_i \quad (1)$$

where  $Attraction_i$  stands for one of the two dependent variables (i.e.,  $Click_i$  or  $Apply_i$ ).<sup>12</sup>  $Software_i$  is a dummy variable equal to one if the advertised position is for the SW position and zero for the BD position. The term  $\beta_1$  represents the ATE of the *Flatter* condition relative to the *No Information* condition. The terms  $\beta_0$  and  $\varepsilon_i$  are the intercept and the random error term, respectively. In turn, the heterogeneous treatment effects with respect to gender are estimated using the following preregistered equation:

$$\begin{aligned} Attraction_i = & \beta_0 + \beta_1 Flatter_i + \beta_2 Woman_i \\ & + \beta_3 Flatter_i \times Woman_i + \beta_4 Software_i + \varepsilon_i \end{aligned} \quad (2)$$

<sup>10</sup>In Appendix A5, we show that our results are robust to various thresholds for the confidence levels of Gender API's gender predictions.

<sup>11</sup>For correlations by position, see Appendix A3.

<sup>12</sup>In the regression for *Apply*, we do not condition on or control for *Click* because it is an intermediate outcome of our treatment (i.e., *Flatter*) and is thus a "bad control" that can bias the estimates (Angrist & Pischke, 2008, pp. 64–68).

TABLE 1 Summary statistics in Study 1.

	By condition			By position	
	All	No Information	Flatter		
<b>Outcomes</b>					
Click	0.2849 (0.4514)	0.2863 (0.4521)	0.2835 (0.4508)	0.1890 (0.3916)	0.3831 (0.4862)
Apply	0.0973 (0.2964)	0.0989 (0.2985)	0.0958 (0.2944)	0.0523 (0.2226)	0.1435 (0.3506)
<b>Hierarchy</b>					
Flatter	0.5009 (0.5000)	0 (0)	1 (0)	0.5005 (0.5001)	0.5014 (0.5001)
<b>Gender</b>					
Woman	0.2688 (0.4433)	0.2701 (0.4441)	0.2674 (0.4427)	0.3059 (0.4608)	0.2307 (0.4214)
<b>Interaction</b>					
Flatter × woman	0.1340 (0.3406)	0 (0)	0.2674 (0.4427)	0.1539 (0.3609)	0.1135 (0.3173)
<b>Job position</b>					
Software	0.4941 (0.5000)	0.4936 (0.5000)	0.4945 (0.5000)	0 (0)	1 (0)
<b>Current job title</b>					
Manager	0.3178 (0.4657)	0.3188 (0.4661)	0.3168 (0.4653)	0.5253 (0.4994)	0.1053 (0.3069)
<b>Years of work experience</b>					
Work experience	13.8536 (8.8420)	13.8297 (8.7117)	13.8776 (8.9655)	16.3175 (9.1617)	10.8187 (7.3770)
<b>Highest degree</b>					
Bachelor's	0.2712 (0.4446)	0.2634 (0.4405)	0.2790 (0.4486)	0.2980 (0.4574)	0.2438 (0.4295)
Masters	0.3578 (0.4794)	0.3594 (0.4799)	0.3561 (0.4789)	0.3173 (0.4655)	0.3993 (0.4898)
Doctorate	0.0173 (0.1303)	0.0174 (0.1308)	0.0171 (0.1297)	0.0186 (0.1352)	0.0159 (0.1250)
<b>Other</b>					
Willing to relocate	0.3684 (0.4824)	0.3708 (0.4831)	0.3661 (0.4818)	0.3288 (0.4698)	0.4091 (0.4917)
No. observations	8167	4076	4091	4132	4035

Note: Standard deviations in parentheses.



where  $\beta_3$  is the difference in the effect of the *Flatter* condition for women relative to men. We estimate Equations 1 and 2 using OLS.<sup>13</sup> Recent research highlights that fixed-effects estimators utilize between-group variation when interaction effects are present (Giesselmann & Schmidt-Catran, 2022; Shaver, 2019). In response, we also employ double-demeaned fixed effects estimators as suggested by Giesselmann and Schmidt-Catran (2022), along with split sample analysis recommended by Shaver (2019). We also use robust standard errors to address the possibility that errors are correlated within a job.

## 4.6 | Results

The results are reported in Table 2 and displayed using bar graphs in Figure 2. In Table 2, panel (a) presents the mean differences using the full sample. In this panel, Models 1–5 measure attraction in terms of whether subjects showed interest in the open positions by clicking on the email's hyperlink to the company's application web page (i.e., *Click*), while Models 6–10 measure whether subjects applied to the job (i.e., *Apply*). Panels (b) and (c) repeat the analysis from panel (a) for only those subjects who were recruited for each job opening (business development and software).

We begin by examining the effect of a flatter hierarchy on subjects' propensity to click. In panel (a), Model 1 shows that the estimated treatment effect is small, negative, and indistinguishable from zero ( $p=.764$ ). This null result could imply one of the following. First, it may suggest that our treatment failed to manipulate the participants' perceptions of hierarchy. However, we believe this is unlikely because Study 2, which uses a similar treatment, shows that the *Flatter* condition is perceived by subjects to have fewer levels of management than the *No Information* condition (see Section 5.7). Second, given that our manipulation very likely succeeded, this finding may indicate that a flatter hierarchy does not impact in any meaningful way the subjects' propensity to click on the hyperlink. Finally, this null result may mean that a flatter hierarchy does affect the subjects' propensity to click but elicits offsetting responses. For example, as argued in Section 2.4, a flatter hierarchy may increase men's propensity to click but decrease women's propensity to click. We explore this explanation and find supportive evidence below.

In line with the notion that employers with flatter hierarchies attract disproportionately fewer women job seekers, Model 2 indicates that, compared to men, women subjects were five percentage points less likely to click the hyperlink in the *Flatter* condition compared to the *No Information* condition ( $p=.024$ ). Because fixed-effects estimators rely on the between-group variation when interaction effects are present (Giesselmann & Schmidt-Catran, 2022, Shaver, 2019), we conduct a parallel analysis using double-demeaned estimators, as recommended by Giesselmann and Schmidt-Catran (2022), in Model 3. The results are very similar, suggesting that the between-job variation is not biasing the results in Model 2. To assess this divergence in the propensity to click, Models 3 and 5 estimate the treatment effect of a flatter hierarchy by splitting the observations by gender. Model 4 reveals that women were approximately four percentage points less likely to click in the *Flatter* condition compared to the *No Information* condition ( $p=.036$ ). In contrast, Model 5 shows that men were one percentage point more likely to click in the *Flatter* condition but the 95% confidence interval overlaps zero. Overall, we document, that while 28% of those who clicked the hyperlink in the *No Information*

<sup>13</sup>As shown in Appendix A4, the results are consistent when using logistic regression.

TABLE 2 Results using the OLS regression in Study 1. Panel (a) employs the full sample, while panels (b) and (c) represent split sample analysis by the job position that was being advertised (business development and software, respectively).

## (a) Full sample

Outcome	Click		Apply							
	Model 1 (All)	Model 2 (All)	Model 3 (All)	Model 4 (Women only)	Model 5 (Men only)	Model 6 (All)	Model 7 (All)	Model 8 (All)	Model 9 (Women only)	Model 10 (Men only)
Sample										
Flatter	-0.0029 (0.0098) [0.7639]	0.0103 (0.0115) [0.3678]	-0.0029 (0.0098) [0.7645]	-0.0390 (0.0186) [0.0362]	0.0103 (0.0115) [0.3682]	-0.0031 (0.0065) [0.6291]	0.0058 (0.0078) [0.4515]	-0.0032 (0.0065) [0.6261]	-0.0277 (0.0117) [0.0177]	0.0058 (0.0078) [0.4524]
Woman										
	0.0280	0.0033					0.0069	-0.0099		
			(0.0110)						(0.0104)	
			(0.01157)						[0.0104)	
			[0.0752]						[0.1578]	
Flatter × woman										
	-0.0493 (0.0218) [0.0242]	-0.0504 (0.0219) [0.0215]								
Position Fees	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Estimator	FE	FE	DDFE	FE	FE	FE	FE	DDFE	FE	FE
No. observations	8167	8167	8167	2195	5972	8167	8167	8167	2195	5972
R <sup>2</sup>	.046	.047	.047	.047	.047	.024	.025	.025	.025	.024

## (b) Business development (BD)

Outcome	Click		Apply							
	Model 11 (BD)	Model 12 (BD)	Model 13 (BD women only)	Model 14 (BD men only)	Model 15 (BD)	Model 16 (BD)	Model 17 (BD women only)	Model 18 (BD men only)		
Sample										
Flatter	0.0011 [0.9298]	0.0221 [0.1303]	0.0146 [0.0368]	-0.0468 [0.0224]	0.0221 [0.1302]	0.0076 [0.2698]	0.0162 [0.0553]	-0.0117 [0.3331]	0.0162 [0.0553]	0.0162 [0.0553]

TABLE 2 (Continued)

(b) Business development (BD)		Apply																	
Outcome	Click	Model 11		Model 12		Model 13		Model 14		Model 15		Model 16		Model 17		Model 18			
Sample	(BD)	(BD)	(BD)	(BD)	women only)	(BD)	women only)	(BD)	men only)	(BD)	women only)	(BD)	women only)	(BD)	women only)	(BD)	women only)	(BD)	men only)
Woman		0.0431 (0.0194) [0.0266]														0.0082 (0.0106) [0.04400]			
Flatter × woman		-0.0690 (0.0268) [0.0100]														-0.0279 (0.0147) [0.0585]			
No. observations	4132	4132		1264		2868		4132		4132		1264		2868					
R <sup>2</sup>	.000	.002		.004		.001		.000		.001		.001		.001		.001		.000	
(c) Software engineering (SW)																			
Outcome	Click	Apply																	
Sample	(SW)	(SW)	Model 19		Model 20		Model 21		Model 22		Model 23		Model 24		Model 25		Model 26		
Flatter	-0.0090 (0.0150) [.5553]	-0.0020 (0.0175) [.9112] [.3074]			-0.0326 (0.0319) [.3074]		-0.0020 (0.0175) [.9112]		-0.0142 (0.0110) [.1995]		-0.0142 (0.0110) [.1995]		-0.0037 (0.0127) [.7681]		-0.0495 (0.0221) [.0255]		-0.0037 (0.0127) [.7680]		
Woman		0.0172 (0.0258) [.5046]												0.0077 (0.0190) [.6875]					
Flatter × woman		-0.0307 (0.0364) [.3995]												-0.0457 (0.0255) [.0730]					
No. observations	4035	4035		931		3104		4035		4035		931		3104					
R <sup>2</sup>	.000	.000		.001		.000		.000		.001		.005		.005		.000			

Note: Robust standard errors in parentheses and p-values in brackets. Models 3 and 8 use DDFE estimators (Giesslmann & Schmidt-Catran, 2022).

Abbreviation: DDFE, double-demeaneed fixed effect.



condition (i.e., 324 out of 1167) were women, only 24% of those who clicked in the *Flatter* condition (i.e., 277 out of 1160) were women—hence, a reduction of 14%.

In Models 6–10, we examine the effect of a flatter hierarchy on subjects' propensity to apply for the job. In line with Model 1, Model 6 exhibits no main effect of a flatter hierarchy. However, like Models 2–5, Models 7–10 support the prediction that a flatter hierarchy decreases women's representation in the applicant pool. Models 7 and 8 reveal that, compared to men, women were about 3.5 percentage points less likely to apply in the *Flatter* condition than in the *No Information* condition ( $p=.017$  and .011, respectively). Similarly, Model 9 shows that women were three percentage points less likely to apply in the *Flatter* condition than in the *No Information* condition ( $p=.018$ ). In contrast, Model 10 indicates that men were about half a percentage point more likely to apply in the *Flatter* condition but the 95% confidence interval overlaps zero. Whereas 27% of the applicants (i.e., 108 out of 403) were women in the *No Information* condition, only 19% (i.e., 76 out of 392) were women in the *Flatter* condition—thus, a reduction of 28%.

Taken together, these results suggest that a flatter organizational structure does not substantively affect the size of the applicant pool, but does seem to decrease women's representation within it.<sup>14</sup>

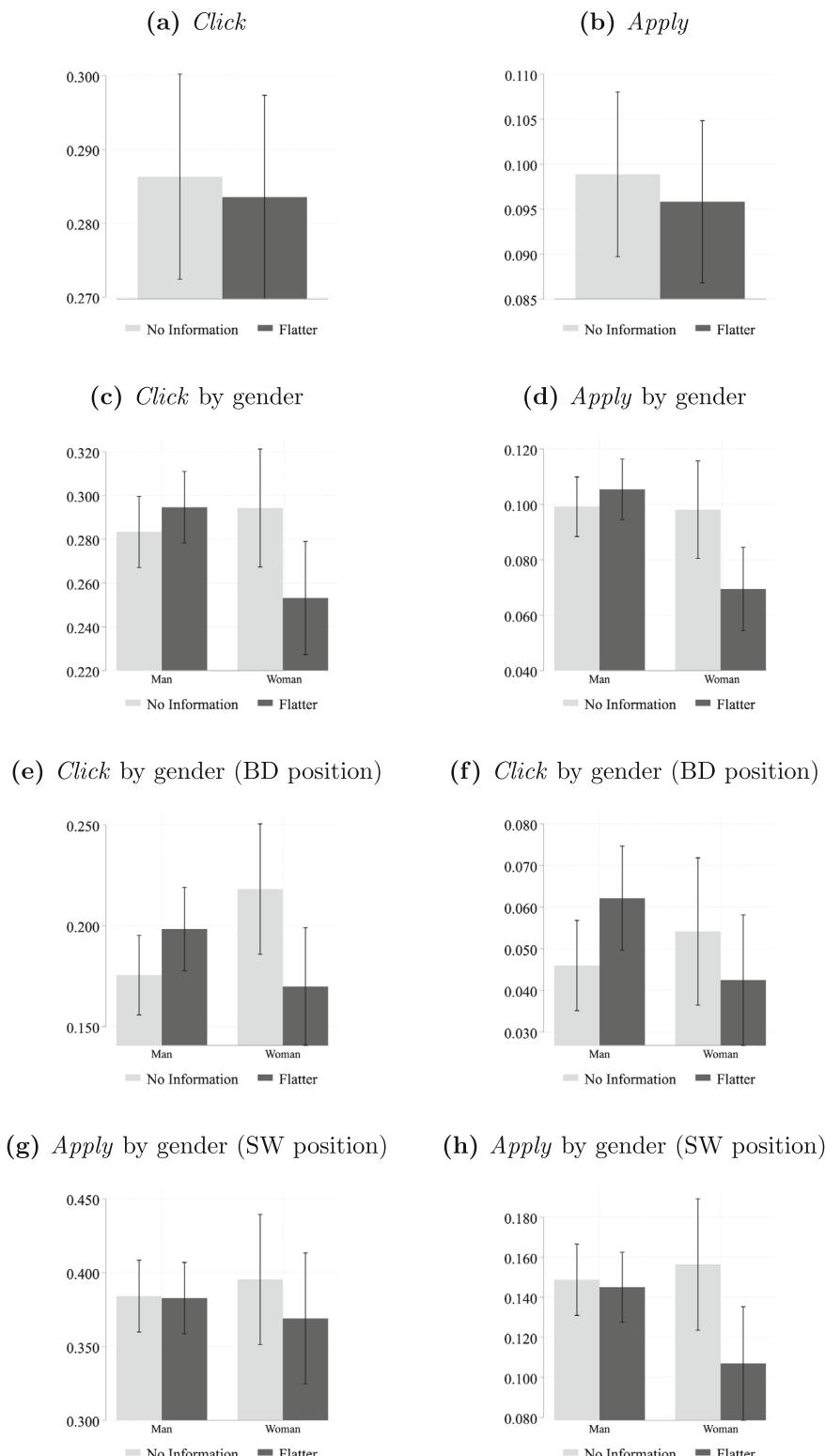
#### 4.7 | Post hoc analyses of heterogeneity across job positions

Before progressing to Study 2, we offer non-preregistered analyses that explore potential heterogeneous effects across the two job positions. These analyses not only shed light on underlying mechanisms but also help address concerns about fixed-effects estimators utilizing between-group variation when interaction terms are present. First, these two occupations differ in many job-level characteristics. For example, compared to the BD occupation, the SW occupation tends to be more technical and knowledge-intensive, have more modularized tasks, offer more autonomy, and require less coordination and in-person interactions, while having lower representation of women and more insular culture.<sup>15</sup> These differences could drive women's and men's relative attraction to flatter hierarchies in opposing ways. On the one hand, this relative attraction could be higher for the SW position than for the BD position because, compared to the latter, the former could be perceived as providing more autonomy and requiring less coordination and in-person interactions. On the other hand, it could be higher because the SW job might be perceived as having fewer women and a more insular culture than the BD job.

In addition to their job-level characteristics, these occupations may consist of different types of job seekers, as job seekers typically select their occupations based on their unique skills and preferences. For example, those interested in a SW position are likely to have a specific educational background (notably, computer science or engineering), a specialized skill set (e.g., computer programming), and a stronger preference for autonomy, flexibility, and other nonpecuniary rewards (Stern, 2004). In contrast, those seeking a BD position may have a broader range of educational backgrounds (including business, economics, psychology, and

<sup>14</sup>In Appendix A6, we report the results for the *Apply* outcome conditional on clicking. However, as the manipulation is embedded in the email and all subjects—regardless of their conditions—see the same job posting after clicking, these results are likely subject to overcontrol bias.

<sup>15</sup>According to the US Bureau of Labor Statistics, women represent 20% of software developers whereas 49% of sales-related occupations.



**FIGURE 2** Bar graphs with 95% confidence intervals for each dependent variable in Study 1. "BD" refers to the business development position. "SW" refers to the software engineer position.

other social sciences), a more general skill set (e.g., communication and soft skills), and a greater preference for interpersonal relationships, promotion, and pecuniary incentives (Bennett, 2013). Thus, these differences in individual-level characteristics could also lead to across-position heterogeneity.

Because these positions differ in many, nonrandomized ways both at the occupation level and at the job-seeker level and because we did not randomize subjects across positions, it is not possible to credibly infer why the effect might differ from one job to the other. Nonetheless, examining across-position heterogeneity might provide suggestive evidence of mechanisms possibly driving these effects. Hence, in Table 2, we replicate the analysis in panel (a) but limit the sample to the subjects recruited for the BD position (panel (b)) and the SW position (panel (c)), respectively (for bar charts, see panels (e)–(h) of Figure 2). Across both subsamples, we again find no main effect of the *Flatter* condition on the outcome *Click* or *Apply*, but the point estimates of the interaction between *Flatter* and *Woman* are negative for both outcomes. It is important to note that, for the outcome *Click*, the point estimate of the interaction effect is larger in magnitude for the BD position ( $\hat{\beta} = -.07, p = .01$ ) than for the SW position ( $\hat{\beta} = -.03, p = .4$ ). For the SW position, the 95% confidence interval overlaps with zero. In contrast, for *Apply*, the point estimate is smaller in magnitude for the BD position ( $\hat{\beta} = -.03, p = .06$ ) than for the SW position ( $\hat{\beta} = -.05, p = .07$ ). For neither outcome, however, do we find evidence that the difference in the effect sizes across the two jobs is different from zero.<sup>16</sup> Hence, these split sample analyses demonstrate that the main results in panel (a) are driven by similar responses by the applicant pools for both positions.

## 5 | STUDY 2: SURVEY EXPERIMENT

We complement our field study with a preregistered survey experiment on Amazon's Mechanical Turk (MTurk). This follow-up experiment had three objectives. First, it allowed us to examine whether our main finding regarding heterogeneous preference by gender would replicate in a broader population of subjects (e.g., those without college degrees or with lower-paying jobs). Second, it enabled us to address the concern that Study 1's results are driven not by perceptions of how flat the organization's hierarchy is, but by novelty aversion, the difference in the email length, or the mere mention of hierarchy. We did so by (1) including a *Taller* condition in addition to the *Flatter* and *No Information* conditions and (2) performing a manipulation check to measure the number of hierarchical levels that the subjects perceived in these conditions. Finally, the survey experiment allowed us to explore the mechanisms that we were unable to examine in the field study.

One common concern with using MTurk is whether its workers (MTurkers) are representative of US workers. Recent studies (e.g., Difallah et al., 2018; Moss et al., 2020; Snowberg & Yariv, 2021) have shown that MTurkers are similar to the US population in terms of occupational and racial composition, but that they tend to be younger, more likely to be women, more educated, and more likely to be employed. We also observe these comparable demographic

<sup>16</sup>The difference for women versus men is .038 ( $p = .4$ ) for *Click* and  $-.0178$  ( $p = .5$ ) for *Apply*. Gelman and Stern (2006) provide a comprehensive explanation as to why, as we see here, even if one effect is statistically different from zero and the other is not, these two effects are not necessarily statistically different one from the other. To borrow their helpful phrase, "even large changes in significance levels can correspond to small, nonsignificant changes in underlying quantities."



attributes in our 8498 subjects (see Appendix A8). Although their median household income tends to be less than that of the US population (e.g., \$47,000 vs. \$57,000; Difallah et al., 2018), most characterize their MTurk work as paid leisure (56%) and a financial source for non-essential expenses (69%). Only 8% consider it a full-time job (Moss et al., 2020). Despite these differences, Snowberg and Yariv (2021) demonstrate that MTurk workers and a representative sample of the US population show similar comparative statics and correlations between behaviors. Furthermore, Kees et al. (2017) find that, compared to other survey data sources (e.g., student and professional panel samples), MTurk offers similar or more reliable data.

## 5.1 | Sampling

In Study 2, we posed as a human resources analytics company and recruited approximately 9000 MTurk workers in the United States.<sup>17</sup> These subjects were asked to complete a task entitled “Give feedback on recruiting material,” which described a job posting for a part-time, remote copy-editor position. We chose a remote position for two reasons: (1) to increase the realism of the experiment, as the subjects are already working remotely and our intended sample size was too large to be geographically focused, and (2) to increase the generalizability of our findings to non-traditional workers. Remote work, however, may be a conservative setting for examining our research question because the perceived effects of hierarchy may be muted when subjects do not expect in-person interactions with coworkers or may not aspire to be promoted.

## 5.2 | Experimental manipulations

As in Study 1, we embedded experimental manipulations in the recruiting material, which consists of four sections as shown in Figure A3 in Appendix A9. The first section described the open position (i.e., “part-time, remote copyeditor”). The second section (“About Us”) provided information on the company. The third and fourth sections listed the job responsibilities and requirements, respectively. Here, the first, third, and fourth sections remained identical across all conditions.

The second section included our manipulations, which we present in detail in Figure A4 in Appendix A10. As in our field experiment, the *Flatter* condition stated that the firm has a “flat organizational structure” with “fewer levels of management than similarly sized startups in our industry.” For the *No Information* condition, this statement was omitted. As discussed in Section 4.2, we chose to provide no information as a control condition in Study 1 because any attempt to include an “inert” condition that described some organizational characteristic might itself have an unintended direct effect on attraction. To address the concern that the observed effects of the *Flatter* condition in Study 1 may have been due to novelty aversion, the difference in the email length, or the mere mention of a flatter hierarchy, we included a *Taller* condition in Study 2. For this condition, the second section mentioned that the firm has a “tall organizational structure” with “more levels of management than similarly sized startups in our

<sup>17</sup>For the sample size, we ran a pilot study with 450 subjects (i.e., 50 subjects per condition) and used the R DeclareDesign to compute the power necessary to detect an effect at the 95% confidence level.

industry.” To ensure that we successfully manipulated perceptions of hierarchy, the *Flatter* and *Taller* conditions included illustrative graphics.<sup>18</sup>

Because the effects of an organization’s hierarchy may depend on the gender of its leadership, we test this boundary condition by manipulating the founder/CEO’s gender. In the second section (i.e., “About Us” in Figure A3), this gender manipulation was implemented by including a gender-typical name (i.e., “Jessica Chandler” or “Michael Chandler”), along with a gender-typical photo (for details, see Figure A4).<sup>19</sup> Overall, our survey experiment consists of nine conditions because the organization’s hierarchical structure (i.e., no information vs. flatter vs. taller) and the founder/CEO’s gender (i.e., no information vs. woman vs. man) each have three conditions.

## 5.3 | Procedure

For this survey experiment, subjects were asked to first review the recruiting material, which contained the experimental manipulations.<sup>20</sup> Next, they advanced to a series of survey questions. The first set of questions checked whether the two treatments succeeded in manipulating the theoretical constructs of interest. For the organization’s hierarchical structure, subjects were asked to indicate how many management levels they believed the firm had between its founder/CEO and entry-level employees. In turn, for the founder/CEO’s gender, they were asked to specify their perception of the founder/CEO’s gender, the direct supervisor’s gender, and the proportion of women employees. The second set of questions asked about the extent to which the subjects found the firm attractive and their perceptions of various organizational characteristics (e.g., autonomy, informality, fit, workload, competition, and career advancement opportunities within the firm). This set also included a free-response question in which they shared their impression of a flatter hierarchy (if in either the *Flatter* or *No Information* condition) or a taller hierarchy (if in the *Taller* condition). The last set of questions inquired regarding the subject’s demographics.

## 5.4 | Measurement

### 5.4.1 | Dependent variable

We measure attraction using Highhouse et al.’s (2003) five-item index of “employee recruitment and organization choice” (for details, see Appendix A11). We used this survey-based measure, rather than actual job applications, because Amazon prohibits recruiting its workers for opportunities outside of MTurk. Subjects responded to each of the five items on a 5-point Likert scale, ranging from “Strongly Disagree” (1 point) to “Strongly Agree” (5 points). After reverse coding the second item in the index, we averaged these scores to calculate attraction.

<sup>18</sup>Because hierarchical structures are commonly represented by two geometric shapes (i.e., a ladder or a pyramid) and these shapes can have different consequences on subjects’ perceptions (Yu et al., 2019), the geometric shape of both illustrative graphics is kept constant (i.e., a pyramid) but with a different number of layers.

<sup>19</sup>These pictures were chosen from the Chicago Face Database, which provides high-resolution, standardized face photographs. We chose two photos that are similar in terms of perceived age, race, attractiveness, and smile intensity.

<sup>20</sup>To prevent bots from contaminating this experiment, we inserted reCAPTCHA before this recruiting material.



### 5.4.2 | Independent variables

Unlike Study 1, which had two experimental conditions, the survey experiment had three conditions: *Flatter*, *No Information*, and *Taller*. Setting the *Taller* condition as the comparison group, we coded these conditions using two binary variables:

$$No\ Information_i = \begin{cases} 1, & \text{if subject } i \text{ received the } No\ Information \text{ condition} \\ 0, & \text{otherwise (i.e., } Flatter \text{ or } Taller \text{ condition).} \end{cases}$$

$$Flatter_i = \begin{cases} 1, & \text{if subject } i \text{ received the } Flatter \text{ condition} \\ 0, & \text{otherwise (i.e., } No\ Information \text{ or } Taller \text{ condition).} \end{cases}$$

### 5.4.3 | Individual attributes

We used the subjects' responses to the demographic questions to record various individual attributes. These attributes include the subjects' gender, current employment status, job title, work experience, and highest level of education. Among these attributes, the key variable of interest is *Woman*, which equals 1 if the subject identified as a woman; 0, otherwise.

### 5.4.4 | Mechanisms

We measured subjects' perceptions regarding a variety of the hiring firm's characteristics using 5-point Likert scales, including the *opportunity* for increased pay and promotion, the level of *autonomy* offered to employees,<sup>21</sup> the degree of *informality* of the firm's procedures, and the procedural *fairness*. We also asked subjects how they perceived their *fit* with the organization, how much *workload* they would expect, whether the work environment would be *competitive* among coworkers, and the extent to which they believed the company would *succeed*. For details on how we measured each of these variables, see Appendix A12.

### 5.4.5 | Boundary condition

To examine the potential boundary condition of leadership gender, we manipulated the founder/CEO's gender and coded the variable *WomanFounder/CEO* as 1 if the subject received the woman founder/CEO condition; 0, otherwise.

## 5.5 | Summary statistics and randomization balance

In Table 3, the first column presents the summary statistics of subjects. Among the 9000 subjects recruited, 8498 completed the survey and passed the attention check using the Founder/CEO's gender. The majority (58.4%) of these 8498 subjects were women. In terms of the highest level of education, 44.0% completed less than a bachelor's degree, while 38.6% had only a

<sup>21</sup>The level of employee autonomy was derived from Lumpkin et al.'s (2009) "autonomy orientation" index.



TABLE 3 Summary statistics in Study 2.

	All	By condition		
	All	Taller	No information	Flatter
<b>Outcome</b>				
Attraction	3.6516 (0.9480)	3.5095 (1.0048)	3.6607 (0.8887)	3.7816 (0.9273)
<b>Hierarchy</b>				
Taller	0.3315 (0.4708)	1 (0)	0 (0)	0 (0)
No Information	0.3291 (0.4699)	0 (0)	1 (0)	0 (0)
Flatter	0.3394 (0.4735)	0 (0)	0 (0)	1 (0)
<b>Gender</b>				
Woman	0.5841 (0.4929)	0.5875 (0.4924)	0.5896 (0.4920)	0.5756 (0.4943)
<b>Interactions</b>				
Taller × woman	0.1948 (0.3960)	0.5875 (0.4924)	0 (0)	0 (0)
No Information × woman	0.1940 (0.3955)	0 (0)	0.5896 (0.4920)	0 (0)
Flatter × woman	0.1953 (0.3965)	0 (0)	0 (0)	0.5756 (0.4943)
<b>Current job title</b>				
Manager	0.2475 (0.4316)	0.2588 (0.4380)	0.2481 (0.4320)	0.2358 (0.4246)
<b>Work experience</b>				
No experience	0.0595 (0.2367)	0.0618 (0.2408)	0.0597 (0.2370)	0.0572 (0.2323)
1–3 years	0.1344 (0.3411)	0.1313 (0.3378)	0.1237 (0.3293)	0.1477 (0.3549)
4–6 years	0.1419 (0.3490)	0.1402 (0.3473)	0.1416 (0.3487)	0.1439 (0.3510)
7–9 years	0.1098 (0.3126)	0.1154 (0.3195)	0.1065 (0.3086)	0.1075 (0.3098)
10+ years	0.5542 (0.4971)	0.5513 (0.4975)	0.5681 (0.4954)	0.5437 (0.4982)
<b>Highest degree</b>				
Less than Bachelor's	0.4395 (0.4964)	0.4459 (0.4971)	0.4408 (0.4966)	0.4320 (0.4954)
Bachelor's	0.3862 (0.4869)	0.3738 (0.4839)	0.3901 (0.4879)	0.3946 (0.4888)
Graduate	0.1743 (0.3794)	0.1803 (0.3845)	0.1691 (0.3749)	0.1734 (0.3786)
No. observations	8498	2817	2797	2884

Note: Standard deviations in parentheses.

bachelor's degree and 17.4% had a graduate degree. While most had more than 6 years of work experience (66.4%), only 24.7% held a managerial position in their most recent job. Overall, compared to the Study 1 participants, our survey experiment subjects were more likely to be women, less educated, and less likely to hold managerial positions. Compared to the population of US workers, these subjects are more likely to be women, more educated, and more likely to be employed (for more information on their demographics, see Appendix A8).

Next, we move on to the second through fourth columns in Table 3, which present the summary statistics by treatment condition. The differences across these conditions are small and have 95% confidence intervals that substantially overlap with zero, implying that randomization was successful and that regression estimates can be interpreted as causal.



## 5.6 | Estimation

First, to check whether our manipulations worked as intended, we apply the following equation:

$$\text{Perc.Flatness}_i = \gamma_0 + \gamma_1 \text{NoInformation}_i + \gamma_2 \text{Flatter}_i + \theta_i + \varepsilon_i \quad (3)$$

where  $\text{Perc.Flatness}_i$  stands for the reverse-coded, perceived number of hierarchical levels. The term  $\theta_i$  represents dummies for the founder/CEO's gender.

We then estimate the main effect of hierarchy on attraction using the specification:

$$\text{Attraction}_i = \beta_0 + \beta_1 \text{NoInformation}_i + \beta_2 \text{Flatter}_i + \theta_i + \varepsilon_i \quad (4)$$

where  $\beta_1$  and  $\beta_2$  each represent the effect of the *No Information* and *Flatter* conditions relative to the *Taller* condition. Again,  $\theta_i$  represents dummies for the founder/CEO's gender.<sup>22</sup>

Finally, we examine whether the effect of hierarchy on attraction varies by gender using the following equation:

$$\begin{aligned} \text{Attraction}_i = & \beta_0 + \beta_1 \text{NoInformation}_i + \beta_2 \text{Flatter}_i + \beta_3 \text{Woman}_i \\ & + \beta_4 \text{NoInformation}_i \times \text{Woman}_i + \beta_5 \text{Flatter}_i \times \text{Woman}_i + \theta_i + \varepsilon_i \end{aligned} \quad (5)$$

where  $\beta_4$  denotes the extent to which attraction to the *No Information* condition relative to the *Taller* condition differs by gender, and  $\beta_5$  represents the extent to which attraction to the *Flatter* condition compared to the *Taller* condition varies by gender. The other terms are the same as in Equation (4). Accordingly, for each mechanism, we use its respective measure as the dependent variable (instead of *Attraction*) and apply the above estimation procedures. In addition, we supplement these OLS regressions with ANOVA tests.

As supplementary, non-preregistered analyses, we apply a two-stage least squares (2SLS) approach, where the randomized interventions ("Taller," "No Information," "Flatter") are instrumental variables for our key explanatory variable of interest (the number of levels of hierarchy that a subject perceived). The second-stage regression provides a more precise, continuous operationalization of our theoretical construct of interest (i.e., perceived flatness), while maintaining the internal validity that comes from the random assignment. Whereas our field experimental design, like nearly all field experiments, could not account for subjects for whom the randomized interventions did not induce variation in the perceived level of hierarchical levels, the instrumental variables approach allows us to estimate the local average treatment effect (LATE), which identifies the effect among the subjects for whom the randomized intervention did induce variation in this explanatory variable (Angrist et al., 1996). To measure the main effect of hierarchy on attraction, we estimate the following 2SLS regressions, where the first stage is equivalent to Equation (3) and the second stage is:

$$\text{Attraction}_i = \beta_0 + \beta_1 \widehat{\text{Perc.Flatness}}_i + \theta_i + \varepsilon_i \quad (6)$$

<sup>22</sup>Because we randomly assigned the founder/CEO's gender, omitting this control variable should not bias our estimates. However, controlling for this variable will result in more precise estimations.



For the heterogeneous effects by gender, we instead estimate the following second-stage equation:

$$\text{Attraction}_i = \beta_0 + \beta_1 \text{Perc.Flatness}_i + \beta_2 \text{Woman}_i + \beta_3 \widehat{\text{Perc.Flatness}_i \times \text{Woman}_i} + \theta_i + \varepsilon_i \quad (7)$$

where  $\text{Perc.Flatness}_i$  and  $\widehat{\text{Perc.Flatness}_i \times \text{Woman}_i}$  are the predicted values of perceived flatness and its interaction with the gender of the subject, respectively. Here, the term  $\beta_3$  represents the heterogeneous LATE by gender of the perceived flatness for those subjects that the treatments caused to perceive more or fewer hierarchical levels.

## 5.7 | Main results

The main results are reported in Table 4 and graphically illustrated using bar graphs in Figure 3. First, Model 1 demonstrates that our manipulation worked as intended (as also shown in panel (a) of Figure 3). Compared to subjects randomly assigned to the *No Information* condition, those in the *Flatter* condition perceived the employer to have 1.3 fewer managerial levels ( $-1.303 \pm .027, p = .000$ ). Relative to the *Taller* condition, subjects assigned to the *No Information* condition perceived the firm to have 1.2 fewer managerial levels ( $-1.199 \pm .027, p = .000$ ). Finally, subjects assigned to the *Flatter* condition perceived the company to have 2.5 fewer levels than those in the *Taller* condition ( $-2.501 \pm .027, p = .000$ ).

Next, Model 2, which estimates Equation (4), indicates that subjects are, on average, least attracted to the *Taller* condition and most attracted to the *Flatter* condition ( $p = .000$ ; for graphical representation, see panel (b) of Figure 3). Likewise, an ANOVA analysis reveals a meaningful difference between the three groups ( $F(2,8495) = 59.73, p = .000$ ). A Tukey post hoc test shows that participants were more attracted to the *No Information* condition than the *Taller* condition ( $.151 \pm .025, p = .000$ ), to the *Flatter* condition than the *Taller* condition ( $.272 \pm .025, p = .000$ ), and to the *Flatter* condition than the *No Information* condition ( $.221 \pm .025, p = .000$ ).

These results cast doubt on the alternative explanation for our Study 1 results that the observed effects of the *Flatter* condition, relative to the *No Information* condition, were driven by novelty aversion, the length of the email, or the mere mention of a flatter hierarchy. However, these results differ from Study 1's results in that they show the main effect of a flatter hierarchy on attraction, thus supporting the argument that job seekers, on average, are more attracted to flatter hierarchies. One explanation for this difference is that, given their selection into remote work, MTurkers likely have a much higher baseline preference than our field-study subjects for the autonomy, flexibility, and informality associated with flatter hierarchies.

Model 3, which estimates Equation (5), tests whether men and women are differentially attracted to *flatter* and *taller* hierarchies. The results are graphically displayed in panel (c) of Figure 3. We find that, relative to men, women are somewhat less attracted to the *No Information* condition than to the *Taller* condition ( $p = .11$ ). However, compared to men, women are less attracted to the *Flatter* condition than to the *Taller* condition ( $p = .0178$ ). Similarly, a two-way ANOVA analysis finds an interaction between the subject's gender and the firm's hierarchy on attraction ( $F(2,8,490) = 3.14, p = .043$ ). However, unlike the field experiment (where women were, in absolute terms, less attracted to the *Flatter* condition than the *No Information* condition; for details, see Section 4.6), this survey experiment shows that women are, in absolute terms, more attracted to the *Flatter* condition than either the *Taller* or *No Information*

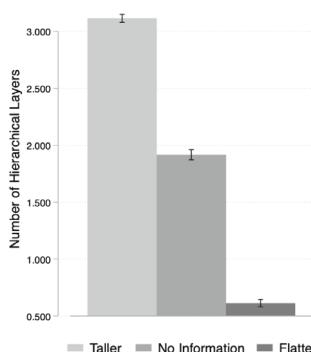


TABLE 4 Main results in Study 2.

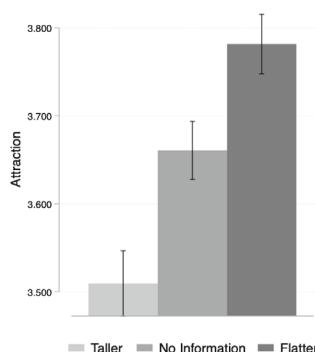
Outcome	Perc. flatness	Attraction				
	Model 1 (OLS)	Model 2 (OLS)	Model 3 (OLS)	Model 4 (2SLS)	Model 5 (2SLS)	
Estimation						
No Information	1.1993 (0.0286) [.0000]	0.1494 (0.0250) [.0000]	0.1968 (0.0399) [.0000]			
Flatter	2.5003 (0.0244) [.0000]	0.2748 (0.0254) [.0000]	0.3490 (0.0406) [.0000]			
Perc. flatness				0.1097 (0.0101) [.0000]	0.1384 (0.0160) [.0000]	
Woman			0.3001 (0.0382) [.0000]		0.3795 (0.0686) [.0000]	
No Information × woman			-0.0813 (0.0509) [.1102]			
Flatter × woman			-0.1227 (0.0517) [.0178]			
Perc. flatness × woman					-0.0475 (0.0205) [.0207]	
No. observations	8498	8498	8498	8498	8498	
R <sup>2</sup>	.511	.032	.048	.031	.045	
KP Wald F statistic	-	-	-	5273.5	1622.6	

Note: Robust standard errors in parentheses and *p*-values in brackets.

(a) Manipulation check



(b) Attraction



(c) Attraction by gender

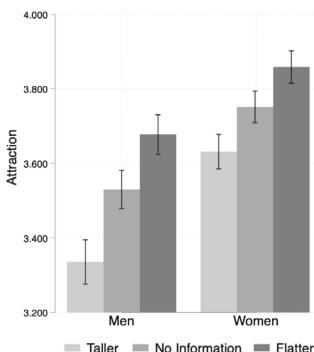


FIGURE 3 Main bar graphs with 95% confidence intervals for Study 2.



condition. As discussed above, this result is plausibly driven by MTurkers' higher baseline preference for autonomy, flexibility, and informality.

We now move on to Models 4 and 5 of Table 4, which show the results of the 2SLS approach. For both models, the first stage is strong, with a Kleibergen-Paap rk Wald  $F$  statistic of 5273.5 and 1622.6, respectively. Because we instrumented the perceived flatness (*Perc. Flatness*) using the randomized variables (i.e., *No Information* and *Flatter*) in the first-stage regression, the coefficient estimate of the variable *Perc. Flatness* in the second-stage regression can be interpreted as the causal effect of one fewer hierarchical level on attraction. Model 4 is consistent with Model 1 in that as subjects' perceptions of hierarchy increase, their attraction also increases ( $p < .001$ ). Model 5 indicates that, compared to men, women are disproportionately less attracted to a flatter hierarchy ( $p = .021$ ). Taken together, these main results of our survey experiment are consistent with our field-study findings that a flatter hierarchy reduces the female representation in the applicant pool.

The key identifying assumption for the above 2SLS approach is the "exclusion restriction," or the requirement that the randomized intervention does not affect attraction except through subjects' *perceived flatness*. Here, it is likely that characterizing an employer as flatter also induces variation in subjects' perceptions of other employer traits (e.g., informality, autonomy, career advancement opportunities). As outlined in Section 2, however, because these perceptions follow from perceptions of hierarchy, they are not violations of the exclusion restriction, but rather the possible mechanisms whereby perceptions of hierarchy shape propensity to seek employment. We consider these mechanisms next.

## 5.8 | Post hoc mechanism analyses

First, we examine how different hierarchical structures affect the average subject's perceptions of a wide range of organizational characteristics. Then, we assess how these perceptions vary by gender. These results are summarized in Table 5. In line with the positive perspective on flatter hierarchies discussed in Section 2.3, subjects, on average, perceive these organizations as granting more *autonomy*. Furthermore, they anticipate that they will *fit* better in flatter employers and that these firms are more likely to *succeed*. However, subjects expect flatter hierarchies to be more *informal*, to provide less *opportunity* for career advancement, and to have less *competition* among employees. They do not, on average, anticipate more or less *fairness* and *workload* in flatter organizations than in taller ones.

We find that women and men vary in key ways in some of these perceptions. Contrary to the positive view of flatter hierarchies discussed in Section 2.4, women subjects, compared to men, perceive flatter employers to offer them less *autonomy*. Furthermore, consistent with the negative perspective, women, compared to men, perceive flatter hierarchies as providing them less *opportunity* for career progression, saddling them with a disproportionately heavier *workload*, and being more difficult for them to *fit* into. Yet, it does not appear that women are less attracted to flatter firms because they perceive more *competition* among employees in flatter organizations. Also, women do not meaningfully differ from men in whether they expect these firms to be more or less *informal*, *fair*, or likely to *succeed*.

These post hoc analyses do not allow us to precisely isolate which mechanism drives women's relative aversion to flatter structures or, more generally, to conclude that women are not attracted to certain aspects of flatter hierarchies. However, they suggest a story that is broadly consistent with the negative perspective on flatter employers we discuss in Section 2.4.

TABLE 5 Post hoc mechanism tests for Study 2.

(a) Using the OLS regression by condition										
Outcome	Opportunity		Autonomy		Informality		Fit		Workload	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Competition	Firm success
No Information	-0.0491 (0.0230) [.0325]	0.4484 (0.0240) [.0000]	0.0869 (0.0267) [.0011]	0.0461 (0.0196) [.0189]	0.1652 (0.0266) [.0000]	0.0132 (0.0228) [.5610]	-0.2780 (0.0235) [.0000]	0.0325 (0.0233) [.1635]		
Flatter	-0.3153 (0.0243) [.0000]	0.9517 (0.0238) [.0000]	0.1182 (0.0265) [.0000]	-0.0006 (0.0200) [.9770]	0.2542 (0.0266) [.0000]	0.0315 (0.0223) [.1582]	-0.2871 (0.0252) [.0000]	0.0720 (0.0234) [.0021]		
No. observations	8498	8498	8498	8498	8498	8498	8498	8498		8498
R <sup>2</sup>	0.037	0.172	0.015	0.017	0.025	0.003	0.021	0.013		

(b) Using the OLS regression by condition and gender										
Outcome	Opportunity		Autonomy		Informality		Fit		Workload	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Competition	Firm success
No Information	0.0162 (0.0359) [.6527]	0.5169 (0.0383) [.0000]	0.0974 (0.0410) [.0175]	0.0593 (0.0310) [.0559]	0.2544 (0.0429) [.0000]	-0.0693 [.0360]	-0.2399 [.0542]	0.0465 (0.0373) [.2130]		
Flatter	-0.2130 [.0369] [.0000]	1.0535 (0.0379) [.0000]	0.1128 (0.0402) [.0050]	0.0148 (0.0312) [.6357]	0.3510 (0.0424) [.0000]	-0.0661 [.0347]	-0.1973 [.0570]	0.1108 (0.0368) [.0026]		
Woman	0.0497 (0.0338) [.1410]	0.1494 (0.0388) [.0001]	0.0545 (0.0378) [.1496]	0.0139 (0.0288) [.6285]	0.2193 (0.0405) [.0000]	-0.2012 [.0321]	0.0189 (0.0340) [.5780]	0.2496 (0.0346) [.0000]		
No Information × woman	-0.1109 [.0467] [.0176]	-0.1167 [.0491] [.0176]	-0.0179 [.0540] [.7396]	-0.0225 [.0400] [.5735]	-0.1520 [.0544] [.0053]	0.1406 (0.0463) [.0024]	-0.0646 [.0477]	-0.0246 [.1755]		
Flatter × woman	-0.1767 [.0490] [.0003]	-0.1738 [.0487] [.0004]	0.0105 (0.0534) [.8447]	-0.0264 [.0407] [.5168]	-0.1637 [.0544] [.0026]	0.1654 (0.0453) [.0003]	-0.1557 [.0509] [.0022]	-0.0623 [.1885]		
No. observations	8498	8498	8498	8498	8498	8498	8498	8498		8498
R <sup>2</sup>	.39	.174	.016	.017	.030	.008	.023	.029		

## (c) Using 2SLS approach by condition

Outcome	Opportunity		Autonomy		Informality		Fairness		Fit		Workload		Competition		Firm success	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8								
Perc. flatness	-0.1275 (0.0097)	0.3807 (0.0097)	0.0468 (0.0106)	-0.0009 (0.0080)	0.1011 (0.0106)	0.0126 (0.0089)	-0.1129 (0.0101)	0.0288 (0.0093)								
[.0000]	[.0000]	[.0000]	[.0000]	[.9137]	[.1920]	[.1572]	[.0000]	[.0020]								
No. observations	8498	8498	8498	8498	8498	8498	8498	8498								
R <sup>2</sup>	.029	.002	.018	.017	.021	.001	.017	.011								

## (d) Using 2SLS approach by condition and gender

Outcome	Opportunity		Autonomy		Informality		Fairness		Fit		Workload		Competition		Firm success	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8								
Perc. flatness	-0.0861 (0.0147)	0.4186 (0.0152)	0.0443 (0.0160)	0.0052 (0.0124)	0.1385 (0.0168)	-0.0259 (0.0138)	-0.0764 (0.0154)	0.0442 (0.0146)								
	[.0000]	[.0000]	[.0056]	[.6740]	[.0000]	[.0612]	[.0000]	[.0025]								
Woman	0.1733 (0.0636)	0.2515 (0.0684)	0.035 (0.0702)	0.0307 (0.0532)	0.3113 (0.0726)	-0.3034 (0.0596)	0.1429 (0.0650)	0.2927 (0.0628)								
	[.0048]	[.0002]	[.6030]	[.5646]	[.0000]	[.0279]	[.0000]	[.0000]								
Perc. flatness × woman	-0.0717 (0.0196)	-0.0648 (0.0197)	0.0056 (0.0213)	-0.0633 (0.0217)	0.0654 (0.0181)	-0.0633 (0.024)	-0.0633 (0.024)	-0.0246 (0.0189)								
	[.0003]	[.0010]	[.8161]	[.5189]	[.0003]	[.1920]	[.0003]	[.1920]								
No. observations	8498	8498	8498	8498	8498	8498	8498	8498								
R <sup>2</sup>	.030	.004	.019	.017	.024	.002	.019	.026								

Note: Robust standard errors in parentheses and p-values in brackets.



Relative to men, women job seekers are disproportionately less attracted to flatter employers because they perceive them as offering relatively less autonomy than men as well as engendering informal workplaces where they will encounter greater difficulty in fitting in and in progressing their careers. Accordingly, one women subject mentioned in the survey's free-response question that "I think of [a flat structure as having] prejudice in the workplace preventing upward mobility of marginalized employees." Another women participant suggested that a flat hierarchy has "the potential for decreasing unnecessary bureaucracy. However, that alone will not solve systemic issues like those faced by women in many companies."

## 6 | DISCUSSION

Flatter hierarchies have garnered much attention as "egalitarian" alternatives to taller, "authoritarian" hierarchies. Despite their potential benefits in motivating current employees, we present evidence that flatter hierarchies have a hidden cost of decreasing gender diversity in the applicant pool. Using a field experiment, we do not find evidence that a flatter hierarchy affects the size of the applicant pool, but we do find that it decreases the representation of women. Using a follow-up survey experiment, we replicate this latter finding and show that women's relative aversion to flatter hierarchies corresponds to cross-gender differences in perceptions of career opportunities, fit, and workload. These findings have several implications for research on labor market gender segregation, organizational design, entrepreneurship, and human capital.

### 6.1 | Theoretical contributions

First, our work adds to the literature on labor market gender segregation. In particular, we extend prior work that has examined the application stage, showing that, relative to men, women may be more inclined to seek employment at organizations with particular characteristics (Abraham & Burbano, 2022; Wiswall & Zafar, 2018). We examine the role of formal hierarchy—a fundamental feature of all organizations (Blau & Scott, 2003; Burton & Obel, 2004; Puranam, 2018; Simon, 1997)—in generating applicant sorting by gender. Drawing upon prior work on gendered organizations and organizational design, we develop opposing perspectives on how a firm's flatter hierarchy impacts women and men job seekers' perception of and their propensity to apply to the firm. We show that flatter hierarchies can exacerbate gender segregation by attracting disproportionately fewer women applicants. We find that this decrease in women's representation reflects cross-gender differences in perceptions of career opportunities, fit, and workload. By considering how women and men differ in their perceptions of organizational characteristics (i.e., formal hierarchy) related to their job-seeking behavior, we answer recent calls to integrate "supply" and "demand-side" perspectives on gender segregation in the labor market (Barbulescu & Bidwell, 2013; Fernandez-Mateo & Kaplan, 2018).

Second, our research contributes to the literature on organizational design by unveiling the role of organizational structure in attracting prospective employees. To date, this literature has primarily focused on how hierarchical structure motivates and coordinates existing employees (Burton & Obel, 2004; Oldham & Hackman, 1981; Puranam, 2018), neglecting its effects on attracting new employees. Although a flatter hierarchy may benefit firms by motivating current employees and spurring their creativity (Keum & See, 2017; Reitzig, 2022), we find that it has



an unintended consequence of decreasing the diversity among prospective employees. Because the likelihood of an employer hiring employees with a certain attribute is typically proportional to their representation in its applicant pool (Fernandez & Abraham, 2011; Fernandez-Mateo & Fernandez, 2016; Petersen et al., 2000), this decrease in applicant diversity may negatively impact employee diversity within the organization.

Third, we advance entrepreneurship research by uncovering an unintended, potentially long-lasting consequence of a flatter hierarchy for startups. Past research has argued that new ventures should be “organic” with a flatter hierarchy to quickly and flexibly adapt to their turbulent environment (Burns & Stalker, 1961). Adding to the burgeoning stream of work reevaluating this received wisdom (e.g., Foss & Klein, 2022; Keum & See, 2017; Lee, 2022; Lee & Csaszar, 2020; Reitzig, 2022), our study reveals that a flatter hierarchy can have an unintended consequence of reducing the gender diversity in the applicant pool and thus aggravating the problem of “diversity debt” (Engel et al., 2023; Wu, 2017). This finding demonstrates how initial decisions that founders make regarding organizational structure may exert a lasting influence on the firm’s evolution and success (Baron et al., 2007; Beckman & Burton, 2008).

Finally, this study extends work on human capital by providing an empirical examination of the endogenous process through which individuals self-select into firms. Although extant studies have enumerated various firm characteristics that affect this selection process (e.g., explicit pro-diversity claims, leadership gender, organizational status, corporate social responsibility; Abraham & Burbano, 2022, Bidwell et al., 2015, Burbano, 2016, Campero & Kacperczyk, 2020, Hurst, 2021, 2023), they have yet to examine the effects of formal hierarchy, which is “one of the defining features of formal organizations” (Sørensen & Sharkey, 2014, p. 329). Given the increasing trend of companies highlighting their flatter hierarchies in their recruiting efforts, we provide the first study that assesses how perceptions of a firm’s hierarchy shape individuals’ self-selection into firms. We also explore mechanisms underlying this relationship by examining how women and men differ in their perceptions. By doing so, we shed light on the selection process that determines founding team characteristics (Shah et al., 2019).

## 6.2 | Limitations and future research

Like all research, this study has limitations. First, although our field experiment may have more external validity than typical lab experiments, it involved a single firm in a specific industry (i.e., a healthcare startup). Moreover, this experiment considered just two job positions (BD Representative and Software Engineer), and its subjects were limited to job seekers with at least a bachelor’s degree. Although we find little evidence of heterogeneous effects across jobs and by individual attributes and our field-study findings are largely consistent in our follow-up survey experiment using a broader population, future studies could enhance the generalizability of our results or delineate their boundary conditions. For example, by employing two-dimensional randomized treatments (i.e., by randomizing not just the employer’s hierarchy but also other characteristics), these studies could evaluate whether job seekers’ attraction to flatter hierarchies varies across hierarchical ranks (i.e., whether job seekers currently hold a managerial or entry-level position, whether the hiring firm’s open position is a managerial or entry-level job); occupations (e.g., gender composition, task modularity, coordination requirement, knowledge intensity); firms (e.g., firm age, firm size, organizational culture, incentive system, mentorship); industries (e.g., high-tech, industry life-cycle); geographies; and time.



Second, our study examined only one dimension of organizational structure as the explanatory variable of interest. Future work could extend this study by probing into other structural dimensions (e.g., the horizontal division of tasks), work arrangements (e.g., remote work), or human resources policies (e.g., job training) that, like formal hierarchy, do not explicitly evoke gender or diversity.

Third, in accordance with prior studies on gendered organizations (e.g., Acker, 1990; Ferguson, 1984; Nicholson, 2010; Reskin, 1988), our study focused on binary gender and measured its composition as the outcome. Although our theoretical arguments and empirical findings might broadly apply to gender non-conforming job seekers given their historically marginalized status, it was empirically infeasible to distinguish these individuals in our field experiment because ZipRecruiter does not provide information on gender and Gender API's algorithm cannot identify these subjects using only their names. In addition, although our survey experiment included a question that captures non-binary gender identities, such identities were extremely rare (i.e., less than 1%) in the sample, making it difficult to estimate the heterogeneous effects for these individuals with a meaningful degree of precision. Building upon this study, future work may develop theories and employ alternative sampling strategies to elucidate how gender non-conforming job seekers perceive flatter hierarchies.

Fourth, in addition to job seekers in the LGBTQ+ community, future research may explore other historically marginalized groups (e.g., racial minorities and immigrants). Although these groups may not encounter the same gender-specific expectations that women face, they may share women's perceptions that flatter organizations leave room for the dominant group to consolidate power in ways that inhibit their career progression. Supporting this argument, several practitioners suggest that flatter organizations disadvantage not only women but also other minority groups (e.g., Diamond, 2019; Finley, 2014; Flower Horne, 2014; Hunt, 2017; Mont, 2017). If this is the case, flatter hierarchies may also substantially reduce employee diversity in terms of identities other than gender.

Fifth, we surveyed an extensive yet finite list of potential mechanisms underlying how a firm's formal hierarchy may shape women and men job seeker's perceptions and their attraction to the firm. Future studies could complement our research by exploring other possible mechanisms that may explain why women and men react differently to flatter or taller hierarchies. These studies may provide additional insights into how flatter organizations could mitigate the underrepresentation of women in their applicant pools.

Finally, our study centered on employee attraction. Yet, it remains unclear whether a flatter hierarchy is more or less likely than a taller one to retain employees, particularly women. If women job seekers' relatively negative perceptions of flatter hierarchies are accurate, flatter organizations may also encounter difficulty in retaining women. Instead, if these perceptions are inaccurate and flatter hierarchies are more advantageous for women, flatter employers may more successfully retain them. The women-retaining advantages of flatter structures might represent a countervailing force that offsets their diversity-reducing effects on the applicant pool. Future work on retention will thus elucidate to what extent flatter hierarchies ultimately augment or ameliorate workplace gender diversity.

## 6.3 | Conclusion

In sum, our study shows firms that tout flatter hierarchies attract fewer women to their applicant pools. Yet, many important insights remain to be uncovered regarding the relationship



between organizational structure and human capital acquisition. We hope our study serves as a foundation for future exploration in this area.

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## DATA AVAILABILITY STATEMENT

Data available on request due to privacy restrictions.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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