



# Everyday challenges to women's presence and authority yield greater burnout and less persistence in a male-dominated profession

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Edited by Susan Fiske, Princeton University, Jamaica, VT; received August 6, 2024; accepted April 6, 2025

While most people believe that women (vs. men) experience more discriminatory treatment at work, especially in male-dominated professions, relatively few women report experiencing such treatment themselves. These low levels of reporting may arise either because discriminatory treatment has declined, even while laypeople's assumptions of widespread discrimination persist, or because it is difficult for individuals to know when they are experiencing discriminatory treatment, leading to underreporting. In investigating this puzzle, we theorized four types of nonsexual workplace experiences that may target women and accumulate to harm well-being, yet may be difficult to recognize as discrimination. To test our predictions, we conducted a longitudinal, multisite experience-sampling study of surgeons, capturing workplace experiences over 5 mo. This approach addresses methodological limitations of past research, which include recall biases, demand characteristics, and low external validity. Consistent with hypotheses, female (vs. male) surgeons had more experiences in which their role was challenged or their authority questioned. Moreover, the frequency and severity of these experiences predicted increased burnout over time and decreased intentions to persist in surgery, regardless of whether participants attributed their experiences to their gender. Contrary to hypotheses, female surgeons did not encounter more presumptions of their helpfulness. Female surgeons also received more positive feedback, especially from other women, which yielded increases in professional efficacy and intentions to persist in surgery. Thus, while difficult to detect, workplace discriminatory treatment continues to harm women's well-being and career opportunities, impede organizations' efforts to recruit and retain women professionals, and exacerbate burnout among health care providers.

gender discrimination | male-dominated professions | authority questioning | burnout

Most people, both men and women, believe that women face discriminatory treatment at work—yet many fewer women report experiencing such mistreatment personally (1). This discrepancy may arise because gendered mistreatment is now relatively uncommon, and overestimated by laypeople (2), or because gendered mistreatment is commonplace, but ambiguous, and therefore difficult for individuals to detect (3, 4). The current project seeks to explore this tension.

Drawing on role congruity theory, we theorize four types of nonsexual discriminatory treatment that may target women, particularly in work settings that are high in status and low in female representation, but that may go relatively undetected as discrimination: a) challenges to one's role, position, or presence at work; b) questioning of one's authority, expertise, or ability; c) withholding of encouragement, support, and positive feedback; and d) presumptions of willingness to perform helpful, extra-role tasks. We hypothesized that whereas such experiences may be difficult for women to definitively label as discrimination, they may nonetheless have cumulative consequences for burnout, professional efficacy, and persistence in the field.

Evidence that women experience more discriminatory treatment at work than men is less robust and vulnerable to more limitations than scholars may assume. Addressing this, we conducted a longitudinal experience-sampling study in a high-status, male-dominated profession to capture men's and women's interpersonal experiences and the impact of these experiences on professional goals and well-being. This approach addresses methodological issues in past research by capturing events with regularity (minimizing recall biases) in an actual workplace (maximizing external validity) without requiring the identification of an experience as gendered (minimizing self-report and demand concerns). This project also advances theory by characterizing specific interpersonal behaviors that may target women

## Significance

We find evidence via a robust, longitudinal, multisite experience-sampling study in the high-status, male-dominated profession of surgery that women (compared to men) face more workplace experiences in which their professional role is challenged or their authority is questioned. In turn, the frequency of such experiences predicts, over time, increases in burnout and reduced plans to persist in the field. Whereas overt workplace discrimination against women has become less socially acceptable, more subtle forms of discrimination such as interpersonal mistreatment, which is simultaneously harder to identify but potentially more harmful to employee well-being, may persist. These findings have implications for women's career opportunities, for burnout among health care providers, and for economies that need women's labor participation to grow.

Author contributions: M.J.W., B.E., S.H., and A.Y.C. designed research; M.J.W., B.E., S.H., J.L.F., A.F., R.A.K., T.K.M., K.N.V., G.M.W., and A.Y.C. performed research; M.J.W. and S.H. analyzed data; and M.J.W. and S.H. wrote the paper.

The authors declare no competing interest.

This article is a PNAS Direct Submission.

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This article contains supporting information online at <https://www.pnas.org/lookup/suppl/doi:10.1073/pnas.2415826122/-/DCSupplemental>.

Published May 12, 2025.

in work environments where their presence is “incongruous.” Our findings are consequential for women’s professional fulfillment, for organizations’ pursuit of gender equity, and for labor shortages in essential professions (5). They also speak to current public conversations about the degree to which gender discrimination has abated versus persists.

## Identifying Discriminatory Treatment

We define gender discrimination at work as differential workplace behavior toward women compared to men (6, 7). This broad conceptualization covers both behaviors that differentially affect women and men, such as when a company promotes one gender more frequently than the other [sometimes termed formal discrimination (8)], as well as behaviors that are differentially directed at women versus men, including overt derogation, sexual harassment, and more ambiguous interpersonal mistreatment (also termed informal, subtle, or everyday discrimination; refs. 8–11). Interpersonal mistreatment, a form of discrimination that may arise from gender stereotypes but may not read as explicitly gendered (for example, questioning a person’s decision), is the focus of the present paper. Note that, consistent with our definition of discrimination as behavior aimed at one gender more frequently than the other, it is not necessary for the target to label an event as discrimination for it to meet the definition, or cause harm. Indeed, ambiguous interpersonal mistreatment may actually be more harmful than overt mistreatment, because of the inherent uncertainty it provokes (3). Ambiguous mistreatment is also more prevalent than overt mistreatment, as well as harder to rectify, more cognitively depleting, and easier to internalize as caused by one’s own shortcomings rather than instigators’ biases (3, 6, 9, 11).

A majority of people—men as well as women—believe that women do face workplace gender discrimination. In a poll, 75% of US working women agreed that women’s and men’s work experiences are unequal. Yet only 18% of those same women reported personally experiencing gender discrimination, not many more than the 10% of men who report the same (1). One factor may be that it can be difficult for individuals to know with certainty whether the treatment they receive is due to their gender (3, 4). This is particularly true in the case of interpersonal discriminatory behavior, which in today’s workplaces is likely to be subtle and ambiguous rather than overt. Organizational actions (such as when a woman receives a lower salary offer than her male colleagues) can potentially be identified as discriminatory through aggregation and may allow for thoughtful consideration or comparison with others’ experiences. In contrast, interpersonal behavior (such as receiving a comment from one’s supervisor) in a busy work setting may not allow for careful reflection in the moment, exacerbating its ambiguity. Finally, the likelihood of attributing one’s experience to discrimination is influenced by a variety of individual and contextual factors (12–16) beyond the experience itself. In sum, a person’s ability to determine with accuracy and certainty that a given interpersonal experience qualifies as gender discrimination, especially when it is not explicit, is quite constrained.

**Evidence of Gendered Mistreatment at Work is Limited.** However, it also is possible that given societal changes, working women are no longer treated more poorly than working men. In the hiring setting, for instance, gender discrimination appears less widespread than many suppose (2, 17, 18). Stereotypes of women as less competent than men have weakened, or even reversed, over time (19). Perhaps lay beliefs are outdated, and working women no longer experience more interpersonal mistreatment than men.

Indeed, existing evidence that women experience gendered mistreatment at work is in fact weaker than scholars may assume. Past approaches to this question have inherent limitations, described below, that constrain our understanding of actual work experiences.

First, evidence shows that within male-dominated professions—but not in more balanced professions—women leave their jobs more frequently than men (20). Women also prioritize inclusive work climates and gender representation in job searches (21, 22) and departure decisions (23). It is plausible to infer from these findings that many women have endured gender discrimination at work, especially in professions with few women, and seek to minimize such treatment going forward. However, it is not a certainty from this evidence alone that past mistreatment is commonplace and is driving women’s career choices.

Next, experimental studies have used the scenario method, in which all factors are held constant save a target’s gender. Women in these scenarios are evaluated more poorly, compared to identical men, when displaying dominance (24–27) or when working in male-typed professions (27–31). It is reasonable to infer therefore that real-life professional women experience similar discriminatory treatment if they pursue high-status roles or male-dominated professions (32). Yet these studies largely capture ratings rather than behaviors, and, by using largely hypothetical scenarios, have limited external validity. It cannot be assumed that laboratory findings necessarily translate to actual workplaces.

Finally, in surveys and interviews, women (vs. men) report having encountered more career obstacles and setbacks (33, 34), and more gender discrimination (35–37). These studies directly access people’s experiences. However, they have several limitations. One is recall biases—reporting events from the past, including across an entire career, is a highly error-prone task (38). Some studies involve women-only samples, precluding a comparison to men. Finally, many ask participants to report experiences specifically attributable to their gender. Yet as noted, identifying gender as the cause of one’s experiences may be difficult, introducing significant noise and vulnerability to researcher demand (16).

In sum, a) women make career choices consistent with having experienced past discrimination, b) participants reading fictional scenarios denigrate women in male-dominated professions, and c) women report having experienced more past gender discrimination than men. Thus, the pattern is consistent, but the evidence is indirect and vulnerable to limitations. Relatively few studies have directly captured men’s and women’s actual workplace experiences. Some papers have used daily-diary or similar methodologies to measure women’s experiences with greater immediacy (10, 39–43); however, these studies focus on women’s feelings of gendered exclusion, more than on gender differences in experience frequencies, and also tend to communicate the study’s focus on gender and/or require participants to attribute their experiences to their gender. The present study took a different approach, quantifying aggregate gender differences in workplace experiences without relying on participants to identify their experiences as gendered.

**A Theoretically Grounded Approach to Gendered Mistreatment at Work (Hypotheses 1 to 4).** We build theory regarding four interaction types that may target women (more than men) in high-status roles, yet may be difficult for women to definitively identify as discrimination: *role challenges*, *authority questioning*, *withholding of encouragement and positive feedback*, and *presumed helpfulness*. These ideas are grounded in role congruity theory (44), which traced women’s underrepresentation in leadership to widely held beliefs that the ability to lead is both more common among

men (than women) and more desirable for men (than women) to possess. We further explored as a research question whether the tendency for such interactions to be experienced more by women (vs. men) would relate to the gender, age, or organizational role of the individuals initiating them.

**Challenges to women's role, position, or presence at work.** Evidence shows that although the majority of women participate in the paid workforce, and many hold supervisory roles, perceivers assume that women hold lower-status occupations than men (45–47). Further, laboratory studies suggest that perceivers' surprise (48) at seeing women wield authority, particularly in male-typed positions, may yield reactions ranging from disgust to sabotage (28, 29, 32, 49–51). We therefore hypothesize that women (vs. men) working in actual high-status, male-dominated occupations will experience more frequent, and more negatively valenced, *role challenges*: interactions in which others challenge, doubt, or express surprise at their professional role or position (Hypothesis 1).

**Questioning of women's authority, expertise, or ability.** Role congruity theory argues that the belief that women have less ability in and suitability for high-status positions will be strengthened in roles that are historically male-dominated (7, 44, 52, 53). Consistent with this, studies find that investors react more negatively to a new female (relative to male) CEO (54); equally performing mutual funds managed by women bring in less outside investment (55); female nonprofit leaders garner fewer donations, even while maintaining financially healthier organizations (56); and gamblers under-bet on female jockeys relative to their racetrack performance (57).

Similarly, women's decisions in male-typed arenas may be perceived as having less legitimacy, giving more room for unhappy subordinates and stakeholders to push back (58–60). Supporting this, female (vs. male) CEOs are more likely to be the targets of shareholder campaigns demanding a change in how the company is run (61, 62), employees are less likely to agree to work overtime for a female boss (63) and more likely to express complaints to them (64), and borrowers are less likely to repay loans to female loan managers (65). We hypothesize that these negative expectations about women's authority and legitimacy may manifest as more frequent, and more negatively valenced, *authority questioning*: everyday interactions involving questions about, or pushback against, a person's decisions (Hypothesis 2).

**Withholding of encouragement, opportunities, and positive feedback.** Resistance to women's presence in male-dominated occupations may also manifest in the support and feedback that women receive. Direct disparagement is relatively uncommon in a functioning workplace; rather, positive support, such as supervisors encouraging mentees, coworkers supporting each other, or clients thanking staff, is generally more common. However, women may receive less such encouragement in domains where their presence is not welcome. Indeed, women are less often encouraged to take on career-boosting “stretch” assignments, compared to men (66). In performance evaluations, women (vs. men) receive less positive feedback—but only in occupations where women are underrepresented (27, 31, 67–70) and when the evaluation is subjective rather than objective (53, 71). We therefore hypothesize that in high-status, male-dominated professions, women (vs. men) will receive less, and less positively valenced, *encouragement and positive feedback* (Hypothesis 3).

**Presumptions of women's helpfulness.** Last, as a legacy of their traditional roles as caregivers, women are assumed to be more helpful than men (72), perceptions that persist into the paid workforce (19). Working women do more “office housework,” such as maintaining the communal kitchen (73), and, in academia, more committee service (74). More broadly, women (compared

to men) face stronger expectations to perform helpful extra-role behaviors at work (75–78), even while such behaviors bring them less professional benefit (73, 79). Thus, we hypothesize that female professionals will have more, and more negatively valenced, interactions involving *presumed helpfulness*, in which others expect that they will willingly complete extra-role tasks (Hypothesis 4).

**Professional Impact of Gendered Mistreatment (Hypotheses 5 to 6).** Does it matter if women have more negative workplace experiences than men? The answer is not a given. Women who enter male-dominated professions may differ from those who select more gender-balanced jobs, or may be motivated to disprove gender stereotypes (80). Perhaps women in male-dominated occupations do experience more negative interactions but are unbothered by them.

Social identity threat theory, however, suggests that people who have been historically excluded from a given domain carry chronic concerns about being negatively evaluated within that domain (81, 82), which may yield stronger responses to interpersonal interactions (83, 84). In one study, women (but not men) were less likely to reapply to executive positions via a search firm after a past rejection from a client of that firm (22).

According to the identity engagement model of social identity threat (85), distress in response to identity threat will manifest as disengagement (39). That is, women in male-dominated arenas may disengage if they perceive that others do not value their efforts or their presence (43, 86, 87). In service-oriented organizations, disengagement can manifest as burnout (40, 42), which involves self-distancing from the people one is supposed to help, and as reduced feelings of professional efficacy (88, 89). We hypothesize that for women (more than men) employed in high-status, male-dominated professions, ambiguous mistreatment in the form of role challenges, authority questioning, withholding of encouragement/positive feedback, and presumed helpfulness will yield *increases in burnout* and *decreases in professional efficacy* over time (Hypothesis 5).

Importantly, the relationship between gendered mistreatment and burnout need not be conscious. Women professionals may suffer burnout even if they are unsure—or doubtful—that their experiences are due to gender (81).

The identity engagement model further holds that after disengagement or burnout comes disidentification—separating oneself not just from other people but from an entire domain (81). Women and underrepresented minorities pull away from STEM or business careers if they have experienced or expect mistreatment in those fields (90, 91). We therefore make a serial mediation prediction such that in high-status, male-dominated professions, women (vs. men) will experience greater increases in burnout and decreases in professional efficacy (via mistreatment experiences), which in turn will *reduce motivation to persist* in the field (Hypothesis 6).

**Study Setting.** The profession selected for hypothesis testing was surgery, which remains among the most prestigious and highly paid occupations, and which continues to be male-dominated. Only 23% of US general surgeons are women, with markedly less representation within many subspecialties, in academia, and in leadership roles (92, 93). There is less representation of women in surgery compared to the physician workforce (37% women), current medical residents (47%), and current medical students (54%, (92), (94)). Indeed, more than 80% of Americans are stumped by the so-called “surgeon riddle,” unable to consider that an injured boy's surgeon could be his mother, rather than his father (95), and surgeons themselves—both male and female—implicitly associate “surgery” with “male” (96).

**Table 1. Examples of participant-reported experiences of role challenges, authority questioning, and encouragement/positive feedback**

<b>Role challenges</b>	A patient's family member was "surprised" that I would be removing his wife's sutures in the clinic by myself... I am a chief resident and introduced myself as doctor. I had to assure him that she would do fine and it would not be a traumatic experience. (F)
	I introduced myself as "Dr. X" and the patient later asked "so are you a nurse doctor?" (F)
	Patients grandpa couldn't comprehend a doctor as young as me (M)
	I was mistaken for a device rep (M)
	Assuming I was janitorial staff (F)
<b>Authority questioning</b>	Consistently mistaken for patient transport every time I walk up to patient room. "Oh are you here to take patient to CT?" No, I am the doctor you called about the problem (F)
	Asked CRNA in OR to extubate patient post op and he snapped back at me that he didn't think it was safe. When I probed why he became very hostile. (F)
	Patient's daughter was giving me a tough time about just wanting to see the attending physician (M)
	I had a post surgical patient who was spiking fevers despite being on Tylenol and prophylactic antibiotics. Based on the time course, my team favored holding off on a fever woke up until 24 hours after surgery. I relayed this message to the nursing team, and received pushback on multiple occasions throughout the day, including involving the patient's family in supporting her conclusion. (F)
	Scrub tech did not want to pass me instruments (F)
	Didn't let me do parts of surgery I know how to do (F)
	I asked a nurse to give a patient juice. She said she would and I told the patient to expect it. She then told another staff member it was inappropriate and never gave the patient juice eroding their confidence in me. (M)
<b>Encouragement/positive feedback</b>	During a case, my attending could not feel a lung metastasis that I could. He trusted me that it was there and we dissected through lung to excise it. He then gave me feedback that I did well on the case after we finished. (F)
	Patient said I was kind and really cared. Performed a procedure to get her intraocular pressure down (M)
	Attending told me I interact with others very well and have great communication. Felt get to get appreciation when I spend a lot of time doing "intern tasks" (F)
	Made special effort to give me an opportunity to sew the inominate/Dacron graft anastomosis in a aortic arch repair (M)
	Given a lot of autonomy on my current rotation to do procedures solo even when my self confidence in my ability to do them by myself is less than my chief residents confidence in me (F)
	Nurse said I was "one of the best ortho residents to come down to the ED in years" (F)

Notes. CT = computerized tomography; CRNA = certified registered nurse anesthetist; OR = operating room; ED = emergency department. Comments are unedited, and may therefore include typos. (M) = reported by a male surgeon. (F) = reported by a female surgeon.

The study sites were four US surgical residency training programs. In the United States, physicians complete residencies in their chosen specialty after graduating from medical school. Resident physicians work full time as licensed doctors but are also supervised by attending physicians. Surgical residencies last at least 5 y and are highly demanding, requiring regulations to limit work to 80 weekly hours. The setting also can be described as high status and competitive: All sites are among the top 20 surgical programs.

## Results

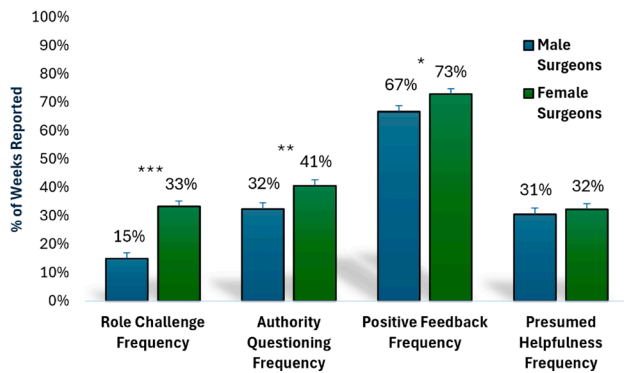
See *SI Appendix* for variable means, SDs, and correlations.

Men (20%) were somewhat more likely than women (13%) to be parents,  $\chi^2 = 3.087$ ,  $P = 0.079$ ,  $\phi = 0.170$ . Men (81%) were also somewhat more likely than women (72%) to be in a surgical subspecialty other than general surgery,  $\chi^2 = 3.574$ ,  $P = 0.059$ ,  $\phi = 0.197$ . We therefore controlled for *parent* and *general surgery* and for dummy variables capturing the program sites. All results are robust to the exclusion of controls (*SI Appendix*).

**Gender and Workplace Experiences (Hypotheses 1 to 4).** To test whether the frequency and valence of workplace experiences differed by gender, we used multilevel regression models to account for the nested nature of the data, fitting weekly reports at level 1 and participants at level 2. Frequency was coded as 1 if the experience was reported that week and 0 otherwise; valence used a 1 to 5 scale (*Materials and Methods*). Table 1 shows illustrative examples, and Fig. 1 displays the frequency results.

We also sought to test the alternative possibility that women's greater reports of specific workplace experiences are due not to women actually having more frequent experiences than men but instead to women being more attentive to and thus more likely to report such experiences. We do not find support for this possibility (*SI Appendix*).

**Role challenges by gender.** Supporting Hypothesis 1, multilevel model results showed a positive coefficient for gender on role challenge frequency, indicating that women (vs. men) reported more role challenges across the study period,  $b = 0.180$ ,  $SE = 0.025$ ,  $t = 7.192$ ,  $P < 0.0001$ , 95% CI [0.131, 0.229]. The model



**Fig. 1.** Frequency of reported experiences by surgeon gender. Results are shown at the person level for ease of display but were analyzed as weekly experiences nested within participants (see text). \* $P < 0.05$ . \*\* $P < 0.01$ . \*\*\* $P < 0.001$ .

predicting valence also showed a positive coefficient, indicating that among those who experienced role challenges, women's (vs. men's) experiences were more negative,  $b = 0.246$ ,  $SE = 0.088$ ,  $t = 2.790$ ,  $P = 0.006$ , 95% CI [0.072, 0.420].

**Authority questioning by gender.** Multilevel model results also showed a positive coefficient for gender on authority questioning frequency, indicating that women reported more experiences of authority questioning,  $b = 0.085$ ,  $SE = 0.028$ ,  $t = 3.014$ ,  $P = 0.003$ , 95% CI [0.030, 0.141]. The coefficient for valence was in the predicted direction but did not achieve significance,  $b = 0.088$ ,  $SE = 0.064$ ,  $t = 1.386$ ,  $P = 0.167$ , 95% CI [-0.037, 0.214]. Thus, Hypothesis 2 was partially supported.

**Encouragement/positive feedback by gender.** For encouragement and positive feedback, results were counter to our expectation. Multilevel model results showed a significantly positive coefficient for frequency, indicating that women reported receiving more encouragement and positive feedback than men,  $b = 0.069$ ,  $SE = 0.028$ ,  $t = 2.477$ ,  $P = 0.014$ , 95% CI [0.014, 0.124]. The coefficient for valence was also significant,  $b = 0.152$ ,  $SE = 0.057$ ,  $t = 2.637$ ,  $P = 0.009$ , 95% CI [0.038, 0.265]; conditional on receiving encouragement or positive feedback, women's experiences were more positive. Hypothesis 3 was not supported; we explore this unexpected result below.

**Presumed helpfulness experiences by gender.** The coefficient for gender was not significant for presumed helpfulness frequency,  $b = 0.023$ ,  $SE = 0.026$ ,  $t = 0.872$ ,  $P = 0.385$ , 95% CI [-0.028, 0.073], nor valence,  $b = 0.003$ ,  $SE = 0.073$ ,  $t = 0.045$ ,  $P = 0.964$ , 95% CI [-0.141, 0.148]; Hypothesis 4 was not supported.

**Gender and workplace experiences by instigator characteristics (exploratory).** We also explored whether gender differences in experiences of role challenges, authority questioning, encouragement/positive feedback, and presumed helpfulness were moderated by characteristics of the primary instigator—namely, gender, age, and role (attending physician, resident physician, staff, patient, or patient family/friend). We saw these analyses as enriching our findings and elucidating potential remedies, but we did not develop specific directional predictions, given mixed evidence regarding whether (for instance) men are more likely than women to display biased attitudes or behavior toward women (97). These models (see summary in Table 2 and a more complete development in *SI Appendix*) suggest that role challenges, authority questioning, and presumptions of helpfulness directed at female (vs. male) surgeons were especially likely to be initiated by those in nonsupervisory roles (*nonattendings*), especially *patients*, and *older (40+)* individuals. In contrast, positive feedback shared with female surgeons was especially likely to be initiated by other *women*.

**Gender and Changes in Burnout and Professional Efficacy as Mediated by Workplace Experiences (Hypothesis 5).**

We next tested whether the effects of gender on workplace experiences would predict changes over time in burnout and professional efficacy. Because both our predictor (gender) and outcome variables (burnout and professional efficacy) were at the higher (person) level, we aggregated responses at this level to facilitate mediation tests (98). Further, in keeping with an expectancy-value approach (99), we calculated as our mediator the product of the average frequency and valence of workplace experiences for each participant. This allowed us to more parsimoniously present models incorporating both dimensions. Last, we added as controls initial (intake) levels of burnout and professional efficacy, allowing tests of change over time in these variables. See *SI Appendix* for full tables.

**Preliminary models (a/b paths).** Analyses of *a* paths showed that, consistent with the multilevel models, gender predicted frequency X valence scores for role challenges,  $b = 0.760$ ,  $SE = 0.110$ ,  $t = 6.926$ ,  $P < 0.0001$ , 95% CI [0.544, 0.976], authority questioning,  $b = 0.407$ ,  $SE = 0.126$ ,  $t = 3.221$ ,  $P = 0.001$ , 95% CI [0.158, 0.656], and encouragement/positive feedback,  $b = 0.443$ ,  $SE = 0.135$ ,  $t = 3.271$ ,  $P = 0.001$ , 95% CI [0.176, 0.709].

Next, *b*-path analyses showed that role challenges,  $b = 0.157$ ,  $SE = 0.047$ ,  $t = 3.317$ ,  $P = 0.001$ , and authority questioning,  $b = 0.128$ ,  $SE = 0.045$ ,  $t = 2.857$ ,  $P = 0.005$ , predicted increased burnout (net of baseline). However, neither predicted changes in professional efficacy,  $b_{RC} = 0.023$ ,  $SE = 0.045$ ,  $t = 0.507$ ,  $P = 0.613$ ;  $b_{AQ} = -0.046$ ,  $SE = 0.041$ ,  $t = -1.120$ ,  $P = 0.264$ . In

**Table 2. Characteristics of instigators of workplace experiences reported by female more than male surgeons**

	Role challenges	Authority questioning	Positive feedback	Presumed helpfulness
Female instigators			*	
Male instigators				
Instigators over 40	**			*
Instigators under 40				
Attending physicians				
Nonattendings	***	*		
Residents/fellows				
Staff members				
Patients	*	†		**
Patients' family/friends		†		

Notes. † $P < 0.10$ . \* $P < 0.05$ . \*\* $P < 0.01$ . \*\*\* $P < 0.001$ . Significance levels indicate that female (relative to male) surgeons were especially likely to report interactions involving this type of instigator. For full models, see *SI Appendix, Table S3*.

contrast, encouragement/positive feedback predicted increased professional efficacy (net of baseline),  $b = 0.121$ ,  $SE = 0.035$ ,  $t = 3.466$ ,  $P < 0.001$ , but not burnout,  $b = 0.003$ ,  $SE = 0.038$ ,  $t = 0.090$ ,  $P = 0.928$ . These relationships guided our selection of mediation tests.

**Mediation tests.** Mediation analyses revealed significant indirect effects of gender on increased burnout (net of baseline) via both role challenge frequency X valence, mediation index = 0.116,  $SE = 0.044$ , 95% CI [0.035, 0.208], and authority questioning frequency X valence, mediation index = 0.043,  $SE = 0.022$ , 95% CI [0.004, 0.091]. Supporting Hypothesis 5, women encountered more role challenges and authority questioning than men, which yielded increased burnout over time.

Analyses also revealed a significant indirect effect of gender on increased professional efficacy (net of baseline) via encouragement/positive feedback, mediation index = 0.579,  $SE = 0.243$ , 95% CI [0.173, 1.127]. Women received more encouragement and positive feedback than men, which yielded increased professional efficacy over time.

Exploratory moderated mediation analyses showed that these indirect effects do not depend on whether participants perceive their employer as supporting them, experience work-family conflict, experience psychological safety, have social support, are more advanced in their training, or have a spouse/partner. (See *SI Appendix* for full models.) Whether women surgeons attributed negative experiences to their gender also did not moderate the effects of these experiences on burnout increases. However, gender attributions were measured only once, at the end of the study, rather than after each event (*SI Appendix*).

**Gender and Changes in Career Intentions as Mediated by Workplace Experiences and Changes in Burnout and Professional Efficacy (Hypothesis 6).** Serial mediation models tested the effects of gender on changes in career intentions via workplace experiences and burnout/professional efficacy, relative to baseline (Hypothesis 6). See Fig. 2 for illustrations and *SI Appendix* for full models.

**Serial indirect effect of gender on career intentions via role challenges and burnout.** Women's (vs. men's) greater role challenge experiences predicted increased burnout and, in turn, decreased certainty about a career in medicine, serial mediation index =  $-0.043$ ,  $SE = 0.018$ , 95% CI [ $-0.083$ ,  $-0.012$ ], decreased certainty about a career in surgery, index =  $-0.032$ ,  $SE = 0.016$ , 95% CI [ $-0.068$ ,  $-0.008$ ], and a decreased intention to pursue academic career options after residency, index =  $-0.081$ ,  $SE = 0.050$ , 95% CI [ $-0.214$ ,  $-0.012$ ], all net of baseline.

**Serial indirect effect of gender on career intentions via authority questioning and burnout.** Similarly, women's (vs. men's) greater authority questioning experiences predicted increased burnout and, in turn, decreased certainty about a career in medicine, serial mediation index =  $-0.017$ ,  $SE = 0.009$ , 95% CI [ $-0.037$ ,  $-0.002$ ], decreased certainty about a career in surgery, index =  $-0.013$ ,  $SE = 0.007$ , 95% CI [ $-0.029$ ,  $-0.002$ ], and a decreased intention to pursue academic career options after residency, index =  $-0.028$ ,  $SE = 0.24$ , 95% CI [ $-0.094$ ,  $-0.001$ ], all net of baseline.

**Serial indirect effect of gender on career intentions via encouragement/positive feedback.** Last, women's greater encouragement/positive feedback experiences predicted increased professional efficacy and, in turn, increased certainty about a career in medicine, serial mediation index = 0.016,  $SE = 0.008$ , 95% CI [0.004, 0.034], as well as increased certainty about a career in surgery, index = 0.010,  $SE = 0.006$ , 95% CI [0.001, 0.025], net of baseline. However, this model did not predict women's (vs. men's) intention to pursue an academic career, index = 0.032,  $SE = 0.031$ , 95% CI [ $-0.006$ , 0.113].

## Discussion

Using a longitudinal, experience sampling methodology that captured over several months men's and women's interpersonal experiences in the high-status, male-dominated profession of surgery, this study found that women were more likely than men to encounter others who challenged their mere presence or questioned their ability to do their job. Regarding our motivating question, these findings suggest that interpersonal gender discrimination has not, in fact, vanished from modern workplaces. Raising existing evidentiary standards with a robust methodological approach, we provide support for the propositions of role congruity theory, capturing real-world evidence of perceivers pushing back when encountering the "incongruity" of a woman wielding power and authority. Older individuals and those in nonsupervisory roles (especially patients) were especially likely to initiate such role challenges and to question women's authority.

Surgeons who encountered more role challenges and authority questioning experienced more burnout over time and, in turn, had more doubts about a career in medicine, surgery, and academia. Supporting the identity engagement model (85) of social identity threat theory, repeated identity-implicating experiences led women to disengage with their work, and in turn to deidentify with their profession. This will only exacerbate the problems of lower recruitment and retention of women in surgery and academic medicine (92, 93), and the overall shortage of surgeons in the United States. (5). Further, because physicians who are burned out provide poorer care, make more errors, and experience depression (100), understanding the antecedents of professional burnout is an urgent problem for both individual well-being and public health (101).

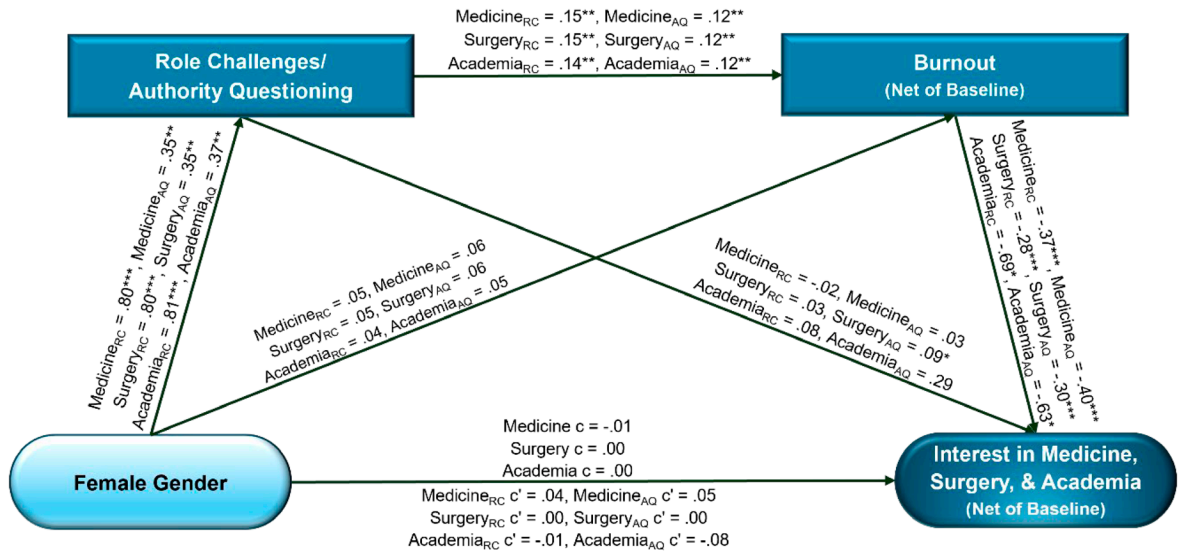
Women did not report more frequent experiences in which others presumed their helpfulness. It is possible that this experience was subsumed for participants in experiences of role challenges, such that surgeons who were asked to perform tasks normally done by others (get a meal tray, tidy a room) interpreted this not as a presumption of helpfulness but as a questioning of their role as surgeons (vs. nurses, housekeeping, etc.; see Table 1).

### Why Do Women Receive More Positive Feedback Than Men?

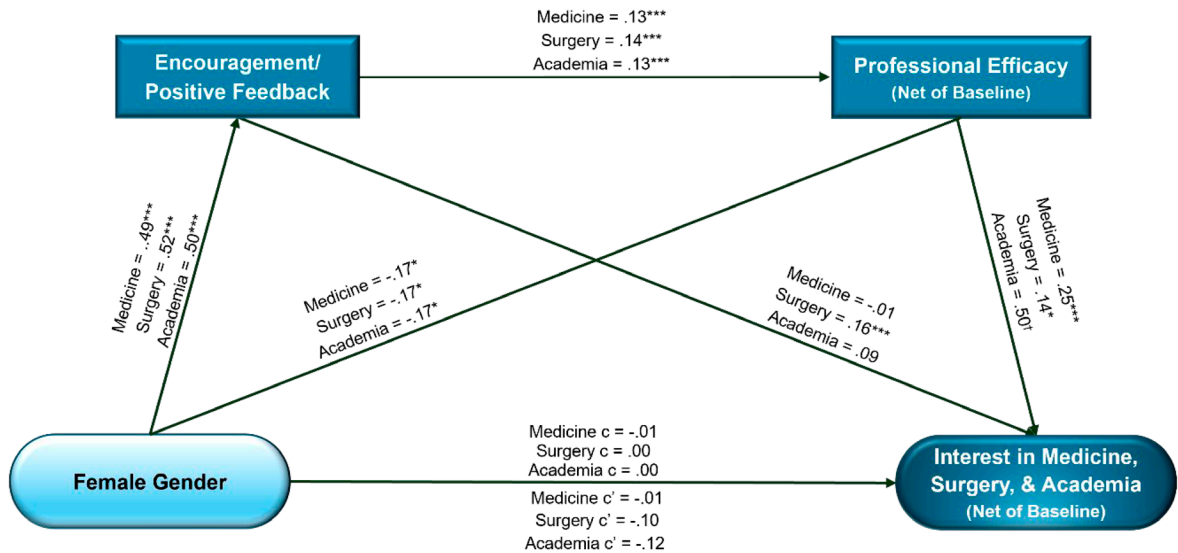
Contrary to predictions, we found that women received *more* frequent encouragement and positive feedback than men—especially from other women. One possibility for this finding is that female (vs. male) surgeons in this sample had better job performance, giving them more opportunities to receive approbation. There is indeed some evidence that female physicians or surgeons perform better, as measured by patient health outcomes (102, 103), even while male surgeons receive more laudatory performance evaluations from supervisors (71, 104). We did not have access to external performance indicators within the current study, but we did ask participants to report the results of their most recent performance evaluation on a 1-5 scale. There was no difference in recalled performance evaluations,  $M_{men} = 4.11$ ,  $SE = 0.08$ ;  $M_{women} = 4.06$ ,  $SE = 0.08$ ;  $F(1, 266) = 0.28$ ,  $P = 0.597$ ,  $\eta^2 = 0.001$ . Moreover, the gender difference in encouragement/positive feedback persists controlling for recalled evaluations.

Alternatively, perhaps observers are more likely to provide positive feedback to women than men, independent of their job performance. Indeed, evidence shows that feedback to women (vs. men) is sometimes more positive, driven by a lay belief that one should be kinder—if less honest—to women (105). Relatedly, observers may be motivated to share encouragement with women (more than men) because they are aware that women surgeons may face interpersonal challenges as numerical minorities in their

A



B



**Fig. 2.** Serial mediation models showing (A) indirect effects of gender on career interests via role challenges (RC subscript) or authority questioning (AQ subscript) and burnout and (B) indirect effects of gender on career interests via encouragement/positive feedback and professional efficacy. <sup>†</sup>*P* < 0.10. \**P* < 0.05. \*\**P* < 0.01, \*\*\**P* < 0.001.

role (106). Supporting this is our finding that positive feedback to women was more likely to come from other women, who may be especially sensitive to this reality.

**Theoretical Implications for Scholarship on Gender and Social Identity Threat.** This study addresses an important gap in scholarship on gender and social identity threat by capturing actual workplace experiences among men and women, documenting the surprise, doubt, and resentment that women may encounter as they exercise authority in roles from which they have historically been excluded. This project complements laboratory methods

offering experimental control with the external validity of real workplaces, and survey and interview studies with a method that reduces recall biases and demand characteristics. Moreover, our theorizing of specific categories of interpersonal behaviors that may target women who wield power advances current theory and future scholarship. Future research could profitably explore these categories more deeply, addressing the limitation in the current project in which different types of events were combined due to survey-length constraints.

For this project, we have defined gender discrimination as more frequent mistreatment of one gender than the other, a definition

that does not require the target to label an experience as discriminatory or as arising from their gender. Indeed, we suggest that accurately identifying an ambiguous interpersonal behavior as gendered is cognitively difficult, or even impossible barring aggregate information indicating whether the other gender is treated similarly. In the current study, the effect of mistreatment on increased burnout was not moderated by women's attribution of these events to their gender. Although the measurement of attributions to gender had methodological limitations, it is of note that this finding contrasts with some past evidence indicating that attributing negative experiences to discrimination can be self-protective and can reduce feelings of isolation (14, 107, 108). Other evidence, however, suggests that attributions to discrimination can harm well-being if the instigating events are perceived as ambiguous, inescapable, or as in conflict with a meritocratic worldview (109–112). It is possible that in an achievement-oriented field such as surgery, attributing ambiguous experiences to discrimination may help protect one's self-esteem as a competent professional while simultaneously undermining assumptions of meritocracy in one's chosen career, perhaps having countervailing effects on well-being.

**Practical Implications for Employees and Organizations.** Our findings raise the evidentiary bar in support of working women who suspect their experiences are different from that of their male colleagues, but lack the supporting aggregate data. Validation that differential experiences persist is important given that women continue to face skepticism, and even retaliation, for reporting workplace mistreatment (113).

In addition, this work has several implications for organizational diversity efforts. First, companies and industries that seek to retain talented women would benefit from the growing literature on interventions to counter social identity threat (114), which can help build a climate in which women's presence is expected and valued rather than comment-worthy. Conversely, evidence that women (vs. men) received more encouragement and positive feedback, particularly from other women, is a reminder of the importance of organizations fostering mentoring relationships and communities of support that may cushion against the negative effects of a chilly climate (115).

Further, our finding that patients and their families—not colleagues or supervisors—were especially implicated in the differential treatment of female (compared to male) surgeons may suggest the need for a shift in focus for the diversity-training industry. The overwhelming majority of interventions aimed at improving workplace diversity climates, such as implicit bias training, focus on changing the behavior of current employees, especially supervisors (116–119). But if supervisors are not the problem, a different approach may be warranted. Indeed, supervisors may be best suited to lead effective solutions, such as protecting employees from disrespectful treatment [e.g., by implementing zero-tolerance policies for harassment, or educating patients about different professional roles (120)] and supporting them when it does occur [e.g., by acknowledging the real consequences of “offhand remarks” or establishing employee resources for mutual support, reappraisal training, and resilience development (121–126)].

Last, we note that the female surgeons in our sample varied in the degree to which they interpreted their negative experiences as sexist—but these experiences led to burnout either way. This suggests that to retain talent and maintain employee well-being, organizations should proactively assess employees' workplace experiences, without depending on targets of discrimination to self-report mistreatment.

## Materials and Methods

We conducted a longitudinal, interval-contingent experience sampling study over 5 mo. This methodological approach reduces noise relative to single-timepoint approaches, allows for the measurement of change over time, and minimizes recall biases. Further, by embedding this project within a larger study of well-being (see *SI Appendix* for all measures), we were able to avoid referencing gender in recruitment and survey materials, thus reducing biases in selection and reporting, limiting demand, and eliminating any expectation that reported experiences be attributed to gender (16).

We report all measures and participant exclusions (there were none). Sample-size goals were determined in advance, and data were not analyzed until data collection was complete. Data and materials are available at [https://osf.io/jv24k/?view\\_only=444625b73c8640278c75b30106edf68a](https://osf.io/jv24k/?view_only=444625b73c8640278c75b30106edf68a). The project was reviewed and approved by the IRB at each US university study site. (Names of the specific IRBs are withheld for participant privacy.) Informed consent was obtained from all participants.

**Participant Sample.** Participants were recruited from four surgical training programs, housed in major US academic medical centers. A nonprobability, voluntary response sampling method was used; recruitment methods included emails, fliers, and word of mouth. All participants were physicians completing a surgical residency or fellowship.

Following a priori power analyses assuming 0.80 power and  $\alpha = 0.05$  (127), we aimed to recruit 300 participants in order to detect small-to-medium ( $d = 0.35$ ) gender differences and indirect effects. Sample modeling and weighting were not employed. We recruited 329 participants to complete the intake survey (34% response rate). Subsequently, 323 participants completed at least one weekly report, and 293 completed the conclusion survey, indicating 11% attrition\*.

Of the intake participants, 53% identified as female<sup>†</sup> and 47% as male,  $M_{age} = 30.1$  y (range 24 to 43). About half (57%) identified as White, 20% as Asian American, 6% as Latinx, 5% as Black, and 1% as Middle Eastern or North African; 11% reported another racial/ethnic identity or multiple identities<sup>‡</sup>. Finally, 24% were training in general surgery whereas the remainder were training in a surgical subspecialty (e.g., otolaryngology, plastic surgery, orthopedic surgery).

**Procedure.** Participants initially completed a 15-min intake survey, delivered via email, which captured demographic variables as well as baseline levels of job outcomes and career intentions. About 5 mo later, we readministered this survey (changes described below) as the conclusion survey.

In the meantime, participants received weekly report forms via text. Texts were sent at noon on Fridays, with a deadline of Sunday at midnight, each week for 13 wk. Up to two reminders were sent between Friday and Sunday.

Participants were paid via small gift cards for each completed survey, with a bonus gift card for their 10th weekly report, and were entered into drawings for larger gift cards at the end of the project.

### Measures.

**Independent variable (intake).** Gender was coded as 1 = male, 2 = female (no participants indicated a nonbinary gender identity).

**Workplace experiences (weekly reports).** Participants' experiences of *role challenges*, *authority questioning*, *encouragement/positive feedback*, and *presumed helpfulness* were captured, in randomized order, via the weekly reports. In the absence of existing measurement tools, items were developed by consulting available models (35) and medical members of the team. Because of survey-length limitations, participants were coded with 1 for the week if any aspect of a particular workplace experience had occurred, and 0 otherwise. We acknowledge that this limits our ability to evaluate more granularly whether gender had a varying relationship with different aspects of these experiences.

\*Compared to participants who remained, participants who dropped out had less initial certainty about a surgical career ( $P < 0.001$ ). However, the two groups did not differ in terms of gender, or in initial levels of burnout, professional efficacy, certainty about a medical career, or interest in academia.

<sup>†</sup>In contrast to surgery overall, our sample was gender-balanced. We attribute this to the use of word-of-mouth recruitment by a team that comprised more women than men, and to tendencies for women to comply more than men with survey requests (130).

<sup>‡</sup>See *SI Appendix* for exploratory analyses involving the intersection of participant gender and racial/ethnic identity.

**Role challenges.** We defined *role challenges* as indications of surprise or doubt that a person is a physician or surgeon. Because physicians typically hold the highest-status roles in hospitals, we also captured whether the person was mistaken for a person holding a different role, which, definitionally, would be a lower-status role. Participants indicated whether, this week at work, "Someone was doubtful whether I was in the right place, someone expressed surprise that I am a physician/surgeon, someone mistook me for a person with a different professional role, or someone confused me with another individual."

**Authority questioning.** We defined *authority questioning* as pushback against a person's authority or ability to make medical decisions. Because physicians must delegate to others (such as nurses or technicians), we included aspects involving delay or pushback in carrying out a request. Participants indicated whether, this week at work, "Someone questioned my authority or expertise, I made a request/order of someone that was not followed right away, someone questioned whether my decision was the right one, or someone seemed doubtful that I knew what I was doing."

**Encouragement and positive feedback.** We defined *encouragement and positive feedback* as the receipt of support, encouragement to challenge oneself, or affirmation of one's ability. This broad coverage allowed for a variety of sources of possible encouragement (including supervisors, peers, staff, or patients). Participants indicated whether, this week at work, "Someone gave me positive feedback or spoke positively of me to others, someone gave me an opportunity to stretch my skills, someone allowed me to take charge of a situation, or someone expressed more confidence in my abilities than I felt inside."

**Presumed helpfulness.** We defined *presumed helpfulness* as the assumption that the participant would complete extra-role tasks. Again, because physicians typically hold high organizational status, extra-role work likely involves work otherwise performed by a lower-status employee (e.g., housekeeping staff). Participants indicated whether, this week at work, "Someone asked me to do something that is usually/sometimes another person's responsibility, or someone assumed that I would take care of a task that is usually/sometimes another person's responsibility."

Participants were next asked follow-up questions about one of their reported experiences, if any. We followed up on only one report (randomly selected) to limit survey completion time and to reduce panel conditioning factors that might discourage reporting of workplace experiences. Follow-up questions asked about event frequency and valence (1, "Really bad," to 5, "Really good") and about the main instigating person involved—namely their gender, age, and role (attending, resident/fellow, staff member, patient, patient's friend/family member, or someone else). Finally, participants were asked to describe the experience in an open-ended text box.

<sup>5</sup>The MBI was originally developed with three factors; however, this structure is the subject of some debate (131). The original emotional exhaustion and cynicism factors, generally highly correlated (132), are frequently described as the conceptual "core of burnout" (133), and are contrasted with professional efficacy. Recent work indicates that either the original three-factor solution or a two-factor solution differentiating burnout (emotional exhaustion and cynicism) from professional efficacy are acceptable (134). Because we did not have a priori theorizing differentiating emotional exhaustion from cynicism, we adopted the two-factor solution for parsimony. Results using the three-factor solution do not differ (*SI Appendix*).

1. Pew Research Center, On pay gap, millennial women near parity—for now (Pew Research Center, 2013). <https://www.pewresearch.org/social-trends/2013/12/11/chapter-2-equal-treatment-for-men-and-women/>. Accessed 1 August 2024.
2. M. Schaerer *et al.*, On the trajectory of discrimination: A meta-analysis and forecasting survey capturing 44 years of field experiments on gender and hiring decisions. *Organ. Behav. Hum. Decis. Process.* **179**, 104280 (2023).
3. L. Doering, J. Doering, A. Tilcsik, "Was it me or was it gender discrimination?" How women respond to ambiguous incidents at work. *Sociol. Sci.* **10**, 501–533 (2023).
4. F. Crosby, The denial of personal discrimination. *Am. Behav. Sci.* **27**, 371–386 (1984).
5. GlobalData Plc, The complexities of physician supply and demand: Projections from 2021 to 2036 (AAMC, Washington DC, 2024). <https://www.aamc.org/media/75236/download>. Accessed 1 August 2024.
6. L. M. Cortina, Unseen injustice: Incivility as modern discrimination in organizations. *Acad. Manage. Rev.* **33**, 55–75 (2008).
7. M. E. Heilman, S. Caleo, F. Manzi, Women at work: Pathways from gender stereotypes to gender bias and discrimination. *Annu. Rev. Organ. Psychol. Organ. Behav.* **11**, 165–192 (2024).
8. B. Welle, M. E. Heilman, "Formal and informal discrimination against women at work" in *Managing Social and Ethical Issues in Organizations*, S. W. Gilliland, D. D. Steiner, D. P. Skarlicki, Eds. (Information Age Publishing, 2007), pp. 229–252.
9. K. P. Jones, C. I. Peddie, V. L. Gilrane, E. B. King, A. L. Gray, Not so subtle: A meta-analytic investigation of the correlates of subtle and overt discrimination. *J. Manage.* **42**, 1588–1613 (2016).

**Burnout and professional efficacy (intake and conclusion).** Burnout and professional efficacy were captured as subscales of the Maslach Burnout Inventory—Human Services (128). Burnout is a feeling that one lacks the energy, motivation, and compassion to do one's job (14 items, e.g., "I feel burned out from my work," "I've become more callous toward people since I took this job,"  $\alpha_{\text{intake}} = 0.906$ ,  $\alpha_{\text{conclusion}} = 0.924$ ), whereas professional efficacy is a sense of workplace competence, efficacy, and impact (eight items, e.g., "I feel I'm positively influencing other people's lives through my work," "I deal very effectively with the problems of my patients,"  $\alpha_{\text{intake}} = 0.853$ ,  $\alpha_{\text{conclusion}} = 0.862$ ). All items used a 1 to 7 Likert scale<sup>5</sup>.

**Career intention variables (intake and conclusion).** *Certainty about a medical career, certainty about a surgical career, and pursuit of academia* after training were examined as career intention variables. Certainty about a medical career was measured with two items ("I am confident that medicine is the right profession for me," "I sometimes have doubts about whether I should be a physician,"  $\alpha_{\text{intake}} = 0.754$ ,  $\alpha_{\text{conclusion}} = 0.690$ ). Certainty about a surgical career was also measured with two items ("I have chosen the right specialty/subspecialty for me," "I am sometimes doubtful that my choice of specialty/subspecialty is the right one,"  $\alpha_{\text{intake}} = 0.805$ ,  $\alpha_{\text{conclusion}} = 0.789$ ). All items used a five-point Likert scale. The second item on both scales was reverse-scored.

For pursuit of academia, participants were asked about their plans after training. *Fellowship* (further training in a subspecialty and research), *academic faculty*, or *research* were coded as 1, whereas *private practice, industry, sabbatical, and something else* were coded as 0.

**Data, Materials, and Software Availability.** Anonymized Survey data have been deposited in Open Science Framework ([https://osf.io/jv24k/?view\\_only=444625b73c8640278c75b30106edf68a](https://osf.io/jv24k/?view_only=444625b73c8640278c75b30106edf68a)) (129).

**ACKNOWLEDGMENTS.** We are grateful for research assistance and feedback from Shaunak Amin, Enuma Anekwe-Desincé, Emily Bianchi, Nancy DeSousa, Hannah Kay, Wilbur Lam, Xiaoran Li, Kyla Terhune, Kelly Vittetoe, Kathy Vo, and the Designated Institutional Officers of the Graduate Medical Offices of our participating programs. We acknowledge funding from the Emory University School of Medicine, Goizueta Business School Dean's Research Funds, University of Michigan Office for Health Equity & Inclusion, University of Washington School of Medicine, Vanderbilt School of Medicine, and Vanderbilt Institute for Clinical & Translational Research. Finally, we thank the participants who shared their time and experiences.

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10. J. K. Swim, L. L. Hyers, L. L. Cohen, M. A. Ferguson, Everyday sexism: Evidence for its incidence, nature, and psychological impact from three daily diary studies. *J. Soc. Issues* **57**, 31–53 (2001).
11. S. S. Walker, A. Corrington, M. Hebl, E. B. King, Subtle discrimination overtakes cognitive resources and undermines performance. *J. Business Psychol.* **37**, 311–324 (2022).
12. D. Kobrynowicz, N. R. Branscombe, Who considers themselves victims of discrimination? Individual difference predictors of perceived gender discrimination in women and men. *Psychol. Women Q.* **21**, 347–363 (1997).
13. C. Bracegirdle *et al.*, The socialization of perceived discrimination in ethnic minority groups. *J. Pers. Soc. Psychol.* **125**, 571–589 (2023).
14. B. Major, T. L. Dover, "Attributions to discrimination: Antecedents and consequences" in *Handbook of prejudice, stereotyping, and discrimination*, T. D. Nelson, Ed. (Psychology Press, 2016), pp. 213–239.
15. D. M. Taylor, S. C. Wright, F. M. Moghaddam, R. N. Lalonde, The personal/group discrimination discrepancy: Perceiving my group, but not myself, to be a target for discrimination. *Pers. Soc. Psychol. Bull.* **16**, 254–262 (1990).
16. J. P. Gomez, J. P. Trierweiler, Does discrimination terminology create response bias in questionnaire studies of discrimination? *Pers. Social Psychol. Bull.* **27**, 630–638 (2001).
17. S. J. Ceci, S. Kahn, W. M. Williams, Exploring gender bias in six key domains of academic science: An adversarial collaboration. *Psychol. Sci. Public Interest* **24**, 15–73 (2023).

18. K. Weisshaar, K. Chavez, T. Hutt, Hiring discrimination under pressures to diversify: Gender, race, and diversity commodification across job transitions in software engineering. *Am. Sociol. Rev.* **89**, 584–613 (2024).
19. A. H. Eagly, C. Nater, D. I. Miller, M. Kaufmann, S. Sczesny, Gender stereotypes have changed: A cross-temporal meta-analysis of US public opinion polls from 1946 to 2018. *Am. Psychol.* **75**, 301–315 (2020).
20. M. M. Elvira, L. E. Cohen, Location matters: A cross-level analysis of the effects of organizational sex composition on turnover. *Acad. Manage. J.* **44**, 591–605 (2001).
21. M. P. Joshi, A. B. Diekmann, My fair lady? Inferring organizational trust from the mere presence of women in leadership roles. *Pers. Social Psychol. Bull.* **48**, 1220–1237 (2022).
22. R. A. Brands, I. Fernandez-Mateo, Leaning out: How negative recruitment experiences shape women's decisions to compete for executive roles. *Admin. Sci. Q.* **62**, 405–442 (2017).
23. P. Dwivedi, I. H. Gee, M. C. Withers, S. Boivie, No reason to leave: The effects of CEO diversity-valuing behavior on psychological safety and turnover for female executives. *J. Appl. Psychol.* **108**, 1262–1276 (2023).
24. M. J. Williams, L. Z. Tiedens, The subtle suspension of backlash: A meta-analysis of penalties for women's implicit and explicit dominance behavior. *Psychol. Bull.* **142**, 165–197 (2016).
25. J. K. Kim, C. M. Harold, B. C. Holtz, Evaluations of abusive supervisors: The moderating role of the abuser's gender. *J. Organ. Behav.* **43**, 465–482 (2022).
26. S. Caleo, Are organizational justice rules gendered? Reactions to men's and women's justice violations. *J. Appl. Psychol.* **101**, 1422–1435 (2016).
27. A. H. Eagly, M. G. Makhijani, B. G. Klonsky, Gender and the evaluation of leaders: A meta-analysis. *Psychol. Bull.* **111**, 3–22 (1992).
28. M. E. Heilman, T. G. Okimoto, Why are women penalized for success at male tasks? The implied communality deficit. *J. Appl. Psychol.* **92**, 81–92 (2007).
29. M. E. Heilman, A. S. Wallen, D. Fuchs, M. M. Tamkins, Penalties for success: Reactions to women who succeed at male gender-typed tasks. *J. Appl. Psychol.* **89**, 416–427 (2004).
30. A. J. Koch, S. D. D'Mello, P. R. Sackett, A meta-analysis of gender stereotypes and bias in experimental simulations of employment decision making. *J. Appl. Psychol.* **100**, 128–161 (2015).
31. S. C. Paustian-Underdahl, L. S. Walker, D. J. Woehr, Gender and perceptions of leadership effectiveness: A meta-analysis of contextual moderators. *J. Appl. Psychol.* **99**, 1129 (2014).
32. L. A. Rudman, K. Fairchild, Reactions to counterstereotypic behavior: The role of backlash in cultural stereotype maintenance. *J. Pers. Soc. Psychol.* **87**, 157–176 (2004).
33. K. S. Lyness, D. E. Thompson, Climbing the corporate ladder: Do female and male executives follow the same route? *J. Appl. Psychol.* **85**, 86–101 (2000).
34. V. J. Roscigno, J. E. Yavorsky, N. Quadlin, Gendered dignity at work. *Am. J. Sociol.* **127**, 562–620 (2021).
35. J. Y. Kim, A. Meister, Microaggressions, interrupted: The experience and effects of gender microaggressions for women in STEM. *J. Business Ethics* **185**, 513–531 (2023).
36. K. Parker, C. Funk, Gender discrimination comes in many forms for today's working women (Pew Research Center, 2017). <https://www.pewresearch.org/short-reads/2017/12/14/gender-discrimination-comes-in-many-forms-for-todays-working-women/>. Accessed 1 August 2024.
37. M. A. McCord, D. L. Joseph, L. Y. Dhanani, J. M. Beus, A meta-analysis of sex and race differences in perceived workplace mistreatment. *J. Appl. Psychol.* **103**, 137–163 (2018).
38. N. M. Bradburn, L. J. Rips, S. K. Shevell, Answering autobiographical questions: The impact of memory and inference on surveys. *Science* **236**, 157–161 (1987).
39. S. E. Holleran, J. Whitehead, T. Schmadler, M. R. Mehl, Talking shop and shooting the breeze: A study of workplace conversation and job disengagement among STEM faculty. *Soc. Psychol. Pers. Sci.* **2**, 65–71 (2011).
40. W. Hall, T. Schmadler, A. Aday, E. Croft, Decoding the dynamics of social identity threat in the workplace: A within-person analysis of women's and men's interactions in STEM. *Soc. Psychol. Pers. Sci.* **10**, 542–552 (2019).
41. W. Hall, T. Schmadler, A. Aday, M. Inness, E. Croft, Climate control: The relationship between social identity threat and cues to an identity-safe culture. *J. Pers. Soc. Psychol.* **115**, 446–467 (2018).
42. W. M. Hall, T. Schmadler, E. Croft, Engineering exchanges: Daily social identity threat predicts burnout among female engineers. *Soc. Psychol. Pers. Sci.* **6**, 528–534 (2015).
43. J. Veldman, C. Van Laar, L. Meeussen, S. Lo Bue, Daily coping with social identity threat in outgroup-dominated contexts: Self-group distancing among female soldiers. *Pers. Soc. Psychol. Bull.* **47**, 118–130 (2021).
44. A. H. Eagly, S. J. Karau, Role congruity theory of prejudice toward female leaders. *Psychol. Rev.* **109**, 573–598 (2002).
45. I. M. Latu *et al.*, What we "say" and what we "think" about female managers: Explicit versus implicit associations of women with success. *Psychol. Women Q.* **35**, 252–266 (2011).
46. A. H. Eagly, W. Wood, Inferred sex differences in status as a determinant of gender stereotypes about social influence. *J. Pers. Soc. Psychol.* **43**, 915–928 (1982).
47. S. Braun, S. Stegmann, A. S. Hernandez Bark, N. M. Junker, R. van Dick, Think manager—think male, think follower—think female: Gender bias in implicit followership theories. *J. Appl. Soc. Psychol.* **47**, 377–388 (2017).
48. N. Zarzeczna, U. von Hecker, T. Proulx, G. Haddock, Powerful men on top: Stereotypes interact with metaphors in social categorizations. *J. Exp. Psychol. Human Percept. Perform.* **46**, 36–65 (2020).
49. V. L. Brescoll, T. G. Okimoto, A. C. Vial, You've come a long way... maybe: How moral emotions trigger backlash against women leaders. *J. Soc. Issues* **74**, 144–164 (2018).
50. S. J. Perry, E. M. Hunter, A. R. Corrington, M. M. R. Hebl, Facing an unexpected negotiation partner: The impact of hiring manager gender role violation on job candidates. *J. Business Psychol.* **39**, 1–27 (2022).
51. M. E. Heilman, F. Manzi, S. Caleo, Updating impressions: The differential effects of new performance information on evaluations of women and men. *Organ. Behav. Hum. Decis. Process.* **152**, 105–121 (2019).
52. M. E. Heilman, Sex bias in work settings: The Lack of Fit model. *Res. Organ. Behav.* **5**, 269–298 (1983).
53. J. Boldry, W. Wood, D. A. Kashy, Gender stereotypes and the evaluation of men and women in military training. *J. Soc. Issues* **57**, 689–705 (2001).
54. P. M. Lee, E. H. James, She-e-o's: Gender effects and investor reactions to the announcements of top executive appointments. *Strateg. Manag. J.* **28**, 224–227 (2007).
55. A. Niessen-Ruenzi, S. Ruenzi, Sex matters: Gender bias in the mutual fund industry. *Manag. Sci.* **65**, 3001–3025 (2019).
56. V. L. Brown, E. E. Harris, The association of female leaders with donations and operating margin in nonprofit organizations. *J. Business Ethics* **185**, 1–21 (2022).
57. V. Cashmore, N. Coster, D. Forrest, I. McHale, B. Buraimo, Female jockeys—What are the odds? *J. Eco. Behav. Organ.* **202**, 703–713 (2022).
58. B. S. Sterling, J. W. Owen, Perceptions of demanding versus reasoning male and female police officers. *Pers. Soc. Psychol. Bull.* **8**, 336–340 (1982).
59. C. T. Varty, L. J. Barclay, D. L. Brady, Beyond adherence to justice rules: How and when manager gender contributes to diminished legitimacy in the aftermath of unfair situations. *J. Organ. Behav.* **42**, 767–784 (2021).
60. A. C. Vial, V. L. Brescoll, J. L. Napier, J. F. Dovidio, T. R. Tyler, Differential support for female supervisors among men and women. *J. Appl. Psychol.* **103**, 215–227 (2018).
61. V. K. Gupta, S. Han, S. C. Mortal, S. Silveri, D. B. Turban, Do women CEOs face greater threat of shareholder activism compared to male CEOs? A role congruity perspective. *J. Appl. Psychol.* **103**, 228–236 (2018).
62. A. P. Cowen, N. V. Montgomery, C. Shropshire, Choosing sides: CEO gender and investor support for activist campaigns. *J. Appl. Psychol.* **107**, 1743–1757 (2021).
63. O. Kacperczyk, P. Younkun, V. Rocha, Do employees work less for female leaders? A multi-method study of entrepreneurial firms. *Organ. Sci.* **34**, 1111–1133 (2023).
64. P. Chakraborty, D. Serra, Gender and leadership in organisations: The threat of backlash. *Eco. J.* **134**, 1401–1430 (2024).
65. L. Doering, S. Thébaud, The effects of gendered occupational roles on men's and women's workplace authority: Evidence from microfinance. *Am. Sociol. Rev.* **82**, 542–567 (2017).
66. E. B. King *et al.*, Benevolent sexism at work: Gender differences in the distribution of challenging developmental experiences. *J. Manag.* **38**, 1835–1866 (2012).
67. B. Greenwood, I. Adjerid, C. M. Angst, N. L. Meikle, How unbecoming of you: Online experiments uncovering gender biases in perceptions of ridesharing performance. *J. Business Ethics* **175**, 1–20 (2022).
68. A. Pazy, I. Oron, Sex proportion and performance evaluation among high-ranking military officers. *J. Organ. Behav.* **22**, 689–702 (2001).
69. O. R. Aragón, E. S. Pietri, B. A. Powell, Gender bias in teaching evaluations: The causal role of department gender composition. *Proc. Natl. Acad. Sci. U.S.A.* **120**, 1–11 (2023).
70. M. Fassiotto, J. Li, Y. Maldonado, N. Kothary, Female surgeons as counter stereotype: The impact of gender perceptions on trainee evaluations of physician faculty. *J. Surg. Edu.* **75**, 1140–1148 (2018).
71. M. B. Antonoff *et al.*, Gender bias in the evaluation of surgical performance: Results of a prospective randomized trial. *Ann. Surg.* **277**, 206–213 (2023).
72. A. H. Eagly, M. Crowley, Gender and helping behavior: A meta-analytic review of the social psychological literature. *Psychol. Bull.* **100**, 283–308 (1986).
73. S. Jang, T. D. Allen, J. Regina, Office housework, burnout, and promotion: Does gender matter? *J. Business Psychol.* **36**, 793–805 (2021).
74. C. M. Guarino, V. M. H. Borden, Faculty service loads and gender: Are women taking care of the academic family? *Res. High. Educ.* **58**, 672–694 (2017).
75. S. K. Farrell, L. M. Finkelstein, Organizational citizenship behavior and gender: Expectations and attributions for performance. *N. Am. J. Psychol.* **9**, 81–95 (2007).
76. P. S. Thompson, D. M. Bergeron, M. C. Bolino, No obligation? How gender influences the relationship between perceived organizational support and organizational citizenship behavior. *J. Appl. Psychol.* **105**, 1338–1350 (2020).
77. P. R. Armijo, J. K. Silver, A. R. Larson, P. Asante, S. Shillcutt, Citizenship tasks and women physicians: Additional woman tax in academic medicine? *J. Womens Health* **30**, 935–943 (2021).
78. L. Babcock, M. P. Recalde, L. Vesterlund, L. Weingart, Gender differences in accepting and receiving requests for tasks with low promotability. *Am. Eco. Rev.* **107**, 714–747 (2017).
79. M. E. Heilman, J. J. Chen, Same behavior, different consequences: Reactions to men's and women's altruistic citizenship behavior. *J. Appl. Psychol.* **90**, 431–441 (2005).
80. A. L. Alter, J. Aronson, J. M. Darley, C. Rodriguez, D. N. Ruble, Rising to the threat: Reducing stereotype threat by reframing the threat as a challenge. *J. Exp. Soc. Psychol.* **46**, 166–171 (2010).
81. C. M. Steele, S. J. Spencer, J. Aronson, "Contending with group image: The psychology of stereotype and social identity threat" in *Advances in Experimental Social Psychology*, M. P. Zanna, Ed. (Academic Press, San Diego, CA, 2002), vol. **34**, pp. 379–440.
82. G. M. Walton, M. C. Murphy, A. M. Ryan, Stereotype threat in organizations: Implications for equity and performance. *Annu. Rev. Organ. Psychol. Organ. Behav.* **2**, 523–550 (2015).
83. J. W. Ryu, E. Gonzalez-Mulé, E. H. O'Boyle, Taking a heavier toll? Racial differences in the effects of workplace mistreatment on depression. *J. Appl. Psychol.* **109**, 611–621 (2024).
84. E. M. David, S. D. Volpone, D. R. Avery, L. U. Johnson, L. Crepeau, Am I next? Men and women's divergent justice perceptions following vicarious mistreatment. *J. Appl. Psychol.* **109**, 1039–1058 (2023).
85. G. L. Cohen, J. Garcia, Identity, belonging, and achievement: A model, interventions, implications. *Curr. Direct. Psychol. Sci.* **17**, 365–369 (2008).
86. E. J. Lombard, S. Cheryan, Does my work matter? Reduced sense of mattering as a source of gender disparities. *Soc. Person. Psychol. Compass* **18**, e12907 (2024).
87. F. Tougas, N. Rinfret, A. M. Beaton, R. de la Sablonnière, Policewomen acting in self-defense: Can psychological disengagement protect self-esteem from the negative outcomes of relative deprivation? *J. Pers. Soc. Psychol.* **88**, 790–800 (2005).
88. A. B. Bakker, E. Demerouti, A. I. Sanz-Vergel, Burnout and work engagement: The JD-R approach. *Annu. Rev. Organ. Psychol. Organ. Behav.* **1**, 389–411 (2014).
89. C. Maslach, W. B. Schaufeli, M. P. Leiter, Job burnout. *Annu. Rev. Psychol.* **52**, 397–422 (2001).
90. J. M. Chen, W. G. Moons, They won't listen to me: Anticipated power and women's disinterest in male-dominated domains. *Group Processes Interg. Relat.* **18**, 116–128 (2015).
91. A. Woodcock, P. R. Hernandez, M. Estrada, P. W. Schultz, The consequences of chronic stereotype threat: Domain disidentification and abandonment. *J. Pers. Soc. Psychol.* **103**, 635–646 (2012).
92. Association of American Medical Colleges, 2022 physician specialty data report (AAMC, Washington DC, 2023).
93. A.-F. Kassam, M. Taylor, A. R. Cortez, L. K. Winer, R. C. Quillin, Gender and ethnic diversity in academic general surgery department leadership. *Am. J. Surg.* **221**, 363–368 (2021).
94. Association of American Medical Colleges, Total U.S. MD-granting medical school enrollment by race/ethnicity (alone) and gender, 2018–2019 through 2022–2023 (AAMC, Washington, DC, 2022). <https://www.aamc.org/media/6121/download>. Accessed 28 February 2023.
95. K. N. Morehouse, B. Kurdi, E. Hakim, M. R. Banaji, When a stereotype dumbfounds: Probing the nature of the surgeon = male belief. *Curr. Res. Ecol. Soc. Psychol.* **3**, 100044 (2022).

96. A. Salles *et al.*, Estimating implicit and explicit gender bias among health care professionals and surgeons. *JAMA Netw. Open* **2**, e196545 (2019).
97. A. C. Vial, J. L. Napier, V. L. Brescoll, A bed of thorns: Female leaders and the self-reinforcing cycle of illegitimacy. *Leadersh. Q.* **27**, 400–414 (2016).
98. A. F. Hayes, N. J. Rockwood, Conditional process analysis: Concepts, computation, and advances in the modeling of the contingencies of mechanisms. *Am. Behav. Sci.* **64**, 19–54 (2020).
99. H. J. Arnold, A test of the validity of the multiplicative hypothesis of expectancy-valence theories of work motivation. *Acad. Manag. J.* **24**, 128–141 (1981).
100. S. Han *et al.*, Estimating the attributable cost of physician burnout in the United States. *Ann. Int. Med.* **170**, 784–790 (2019).
101. Office of the Surgeon General, Addressing health worker burnout: The U.S. surgeon general's advisory on building a thriving health workforce (U.S. Department of Health and Human Services, Washington, DC, 2022). <https://www.hhs.gov/sites/default/files/health-worker-wellbeing-advisory.pdf>. Accessed 1 August 2024.
102. Y. Tsugawa *et al.*, Comparison of hospital mortality and readmission rates for Medicare patients treated by male vs. female physicians. *JAMA Int. Med.* **177**, 206–213 (2017).
103. C. J. Wallis *et al.*, Comparison of postoperative outcomes among patients treated by male and female surgeons: A population based matched cohort study. *BMJ* **359**, j4366 (2017).
104. B. Nuyen, J. Altamirano, M. Fassiotto, J. Alyono, Effects of surgeon sociodemographics on patient-reported satisfaction. *Surgery* **169**, 1441–1445 (2021).
105. L. Jampol, A. Rattan, E. B. Wolf, A bias toward kindness goals in performance feedback to women (vs. men). *Percept. Soc. Psychol. Bull.* **49**, 1423–1438 (2023).
106. M. S. Herscovis, N. Bhatnagar, When fellow customers behave badly: Witness reactions to employee mistreatment by customers. *J. Appl. Psychol.* **102**, 1528–1544 (2017).
107. B. Major, C. Kaiser, S. McCoy, It's not my fault: When and why attributions to prejudice protect self-esteem. *Pers. Soc. Psychol. Bull.* **29**, 772–781 (2003).
108. D. Bourguignon, E. Seron, V. Yzerbyt, G. Herman, Perceived group and personal discrimination: Differential effects on personal self-esteem. *Eur. J. Soc. Psychol.* **36**, 773–789 (2006).
109. B. Major, W. J. Quinton, T. Schmader, Attributions to discrimination and self-esteem: Impact of group identification and situational ambiguity. *J. Exp. Soc. Psychol.* **39**, 220–231 (2003).
110. B. Major, C. Kaiser, L. O'Brien, S. McCoy, Perceived discrimination as worldview threat or worldview confirmation: Implications for self-esteem. *J. Pers. Soc. Psychol.* **92**, 1068–1086 (2007).
111. M. Schmitt, N. Branscombe, T. Postmes, A. Garcia, The consequences of perceived discrimination for psychological well-being: A meta-analytic review. *Psychol. Bull.* **140**, 921–948 (2014).
112. K. Stroebe, J. Dovidio, M. Barreto, N. Ellemers, M.-S. John, Is the world a just place? Countering the negative consequences of pervasive discrimination by affirming the world as just. *Br. J. Soc. Psychol.* **50**, 484–500 (2011).
113. F. Dobbin, A. Kalev, The promise and peril of sexual harassment programs. *Proc. Natl. Acad. Sci. U.S.A.* **116**, 12255–12260 (2019).
114. G. L. Cohen, D. K. Sherman, The psychology of change: Self-affirmation and social psychological intervention. *Annu. Rev. Psychol.* **65**, 333–371 (2014).
115. T. Dennehy, N. Dasgupta, Female peer mentors early in college increase women's positive academic experiences and retention in engineering. *Proc. Natl. Acad. Sci. U.S.A.* **114**, 5964–5969 (2017).
116. V. W. Lau, V. L. Scott, M. A. Warren, M. C. Bligh, Moving from problems to solutions: A review of gender equality interventions at work using an ecological systems approach. *J. Organ. Behav.* **44**, 399–419 (2023).
117. P. G. Devine *et al.*, A gender bias habit-breaking intervention led to increased hiring of female faculty in STEMM departments. *J. Exp. Soc. Psychol.* **73**, 211–215 (2017).
118. E. L. Paluck, R. Porat, C. S. Clark, D. P. Green, Prejudice reduction: Progress and challenges. *Annu. Rev. Psychol.* **72**, 533–560 (2021).
119. A. Kalev, F. Dobbin, E. Kelly, Best practices or best guesses? Assessing the efficacy of corporate affirmative action and diversity policies. *Am. Sociol. Rev.* **71**, 589–617 (2006).
120. J. Beattie, K. Innes, D. Griffiths, J. Morphet, Workplace violence: Examination of the tensions between duty of care, worker safety, and zero tolerance. *Health Care Manag. Rev.* **45**, E13–E22 (2020).
121. K. Schneider, E. Wesselmann, E. DeSouza, Confronting subtle workplace mistreatment: The importance of leaders as allies. *Front. Psychol.* **8**, 1051 (2017).
122. M. Zhou, L. Rao, Finding the silver lining: Emotion regulation perspective on customer mistreatment and employee performance. *Curr. Psychol.* **43**, 35110–35124 (2024).
123. M. J. Neubert, E. M. Hunter, R. C. Tolentino, Modeling character: Servant leaders, incivility and patient outcomes. *J. Business Ethics* **178**, 261–278 (2021).
124. M. A. Al-Hawari, S. Bani-Melhem, S. Quratulain, Do frontline employees cope effectively with abusive supervision and customer incivility? Testing the effect of employee resilience. *J. Business Psychol.* **35**, 223–240 (2020).
125. Z. Pap, D. Virgá, G. Notelaers, Perceptions of customer incivility, job satisfaction, supervisor support, and participative climate: A multi-level approach. *Front. Psychol.* **12**, 713953 (2021).
126. T. Gong, Y. Yi, J. N. Choi, Helping employees deal with dysfunctional customers. *J. Serv. Res.* **17**, 102–116 (2014).
127. F. Faul, E. Erdfelder, A.-G. Lang, A. Buchner, G\* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behav. Res. Methods* **39**, 175–191 (2007).
128. C. Maslach, S. E. Jackson, The measurement of experienced burnout. *J. Occupat. Behav.* **2**, 99–113 (1981).
129. M. J. Williams *et al.*, Longitudinal experience sampling study in a male-dominated profession. Open Science Framework. [https://osf.io/jv24k/?view\\_only=444625b73c8640278c75b30106edf68a](https://osf.io/jv24k/?view_only=444625b73c8640278c75b30106edf68a). Deposited 1 July 2024.
130. K. E. Green, Sociodemographic factors and mail survey response. *Psychol. Market.* **13**, 171–184 (1996).
131. J. A. Worley, M. Vassar, D. L. Wheeler, L. L. Barnes, Factor structure of scores from the Maslach Burnout Inventory: A review and meta-analysis of 45 exploratory and confirmatory factor-analytic studies. *Educ. Psychol. Meas.* **68**, 797–823 (2008).
132. C. Maslach, M. P. Leiter, Early predictors of job burnout and engagement. *J. Appl. Psychol.* **93**, 498 (2008).
133. F. H. Walkey, D. E. Green, An exhaustive examination of the replicable factor structure of the Maslach Burnout Inventory. *Educ. Psychol. Meas.* **52**, 309–323 (1992).
134. L. T. De Beer, L. van der Vaart, M. Escaffi-Schwarz, H. De Witte, W. B. Schaufeli, Maslach Burnout Inventory-general survey: A systematic review and meta-analysis of measurement properties. *Eur. J. Psychol. Assess.* **40**, 360–375 (2024).