

Journal of Applied Psychology

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Online First Publication, October 10, 2022. <http://dx.doi.org/10.1037/apl0001033>

CITATION

Schuster, C., Sparkman, G., Walton, G. M., Alles, A., & Loschelder, D. D. (2022, October 10). Egalitarian Norm Messaging Increases Human Resources Professionals' Salary Offers to Women. *Journal of Applied Psychology*. Advance online publication. <http://dx.doi.org/10.1037/apl0001033>

RESEARCH REPORT

Egalitarian Norm Messaging Increases Human Resources Professionals' Salary Offers to Women

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Across the globe, men make markedly more money than women, even within the same position. We introduce egalitarian norm messaging as a potential intervention to increase women's salaries and counter the gender pay gap. In two preregistered experiments with seasoned professionals ($N = 435$, work experience: $M > 8$ years, salary negotiations: $M > 18$ per year), we find a significant gender pay bias—Human Resources (HR) experts offered markedly lower salaries in an online negotiation to (simulated) female versus male candidates with identical qualifications. Moreover, the experiments show that dynamic (Experiments 1a and 2), as well as static egalitarian norm messages (Experiment 1a), increased salary offers to women. Exploratory mediation analyses suggest that the dynamic egalitarian norm effect was driven by HR professionals' feeling of working toward a shared goal of greater equity. A message that merely increased awareness of the pay gap did not elicit this feeling and did not significantly increase salary offers to women but resulted in fairly equal treatment of men and women (Experiment 2). While the egalitarian norm intervention significantly increased salary offers to women, it also unexpectedly *reduced* offers to men, thereby reversing the gender bias (Experiment 2). We discuss the theoretical contribution with regard to gender pay bias and egalitarian norm interventions, as well as applied implications.

Keywords: gender pay gap, gender bias, negotiation, norms, dynamic norm

Supplemental materials: <https://doi.org/10.1037/apl0001033.supp>

Across the globe, the gender pay gap remains shockingly prevalent. For every dollar earned by a man in the member countries of the Organization for Economic Co-Operation and Development, a woman earns 87.2 cents, a 12.8% difference (Organisation for Economic Co-Operation and Development [OECD], 2021). In the U.S. and the EU, pay gaps are even larger with 18.5% and 15.3%, respectively. Even after controlling for structural factors that contribute to the pay gap (e.g., different occupations or part-time work), a substantial disparity remains as follows: The “adjusted” gender pay gap is approximately 5% in the United States and 6%–7% in Germany (Chamberlain et al., 2019; European Commission, 2018; Finke et al., 2017), which amounts to several thousand dollars each year for a middle-class income. The global gender pay gap has reduced over the past 15 years but slowly: Based on the current

trajectory, it will take more than 135 years before it is eliminated (see World Economic Forum, 2021, p. 15).

Thus, it has become a major political and societal goal to expedite gender pay equality (e.g., Biden, 2020; Kulich et al., 2015). Many interventions strive to increase women's aspirations for high-paying jobs, to mitigate stereotype threat when navigating domains traditionally seen as incongruent with their gender role, or to improve women's negotiation skills (e.g., Balafoutas et al., 2018; Kray et al., 2002; Liu et al., 2020; Stevens et al., 1993; Stout et al., 2011). These approaches can be effective, but it is also necessary to grapple with the external factors that contribute to the gender pay gap. A plethora of research shows that discrimination against women in organizational contexts may hinder them from entering higher paying jobs (for meta-analyses, see Koch et al., 2015; Olian et al., 1988). Particularly relevant for the present study is experimental evidence of gender bias in salary offers (Correll et al., 2007; Schwieren, 2003) and in negotiations more broadly (Amanatullah & Tinsley, 2013a, 2013b): Even when women ask for the same pay, they are offered less than men. A limitation of past research is that it used student participants, although the findings are in line with field studies showing that women are compensated less for their work (Joshi et al., 2015). Here, we focus on salary offers made to female versus male job candidates. Counteracting bias and, more generally, increasing offers to women could help reduce the pay gap without placing the burden of change solely on the women who suffer from it.

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The full study materials, preregistration documents, data, and for Experiments 1b and 2, the SPSS syntax for analyses are available on the Open Science Framework (link: <https://osf.io/9ewnp/>). The present research was supported by a research grant from the German Science Foundation (DFG-LO2201/2-1).

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In the present research, we seek to illuminate ways to increase the salaries offered to women, reduce gender bias, and examine the underlying psychological mechanisms: First, building on social norm research (Miller & Prentice, 2016), we test whether an egalitarian norm message that highlights that Human Resources (HR) professionals try to mitigate the gender pay gap can raise their salary offers to women. We also explore messages' effects on offers to men, unearthing potential downsides (Experiment 2). Second, we hone in on the necessary and sufficient elements of norm messages that increase offers to women. Specifically, we compare messages that present egalitarian behaviors as a current reality or a growing trend (Experiment 1) and test the added value of an egalitarian norm message over simply raising awareness of pay inequity (Experiment 2). We also explore competing mechanisms, contrasting how much messages elicit a feeling of working toward a shared goal (intrinsic motivation) versus a subjective pressure to comply (causing reactance). Thereby, this research contributes to a better understanding of norm interventions and potential adaptations of egalitarian norm interventions in future research and applied contexts.

How Social Norms May Both Contribute to and Attenuate Gender Bias in HR Professionals

Social norms guide behavior and can be a powerful approach to changing it (Miller & Prentice, 2016; Tankard & Paluck, 2016). According to the Focus Theory of Normative Conduct (Cialdini et al., 1990, 1991; Kallgren et al., 2000), individuals follow the most salient norm, whether that be what others seem to do (descriptive norms) or what others seem to approve or believe should be done (injunctive norms). The gender pay gap, itself, is a descriptive norm—men receive higher salaries than women. This norm may serve as a default decisional shortcut for HR professionals in salary negotiations, who may lower their offers to women, increase their offers to men, or both at the same time—thus creating a gender bias. In addition, HR professionals may also perceive an injunctive norm to *not* discriminate or a descriptive norm to promote fairness. Such norms to ensure equal pay may be present either as a personal goal or in the organizational context; yet, they may not be very salient in the negotiation setting. If so, the Focus Theory of Norms suggests that guiding attention toward desirable norms promoting gender equity is key to changing behavior. For example, the message “HR professionals are attempting to close the gender pay gap” may motivate other HR professionals to follow this norm instead of the gender pay gap norm.

Illustrating this general reasoning, cues that highlight norms of desirable behaviors—for instance, (a) descriptive norms like “80% of our hotel guests reuse their towel” (Goldstein et al., 2008; Nolan et al., 2020; meta-analysis by Scheibehenne et al., 2016, for a critical reply see Carlsson et al., 2017), (b) injunctive norm cues such as evaluations of levels of energy consumption, or (c) combined injunctive and descriptive messages (Cialdini et al., 1990; Schultz et al., 2007)—can effectively promote desirable behaviors. Previous research also shows that such norm messages can foster equality, specifically pro-diversity attitudes and behavioral intentions to confront prejudice (Bennett & Sekaquaptewa, 2014; Gainsburg & Sekaquaptewa, 2020), and even reduce disparities in the experience and achievement of marginalized groups (Murrar et al., 2020). Expanding prior findings to the context of the gender

pay gap, we develop norm messages directed at HR professionals that seek to promote equitable pay. We empirically examine their effect to counteract the disadvantage of being a woman in a salary negotiation.

How Egalitarian Norm Messages May Trigger Intentional Change Versus Reactance

Even though desirable norms were effective across various contexts, there are several pitfalls to avoid. For instance, messages that egalitarian behavior is already the norm, in the sense of an accomplished goal instead of an ongoing effort, may both be false and render further behavioral change unnecessary, thereby ironically inhibiting it (Förster et al., 2005). In addition, making injunctive norms salient may have unwanted side effects: As they imply social pressure, people may perceive them as threatening their autonomy, which can elicit psychological reactance (Kang et al., 2021; Kavvouris et al., 2020). For example, people told to pay women fairly might feel unduly blamed or pressured toward “politically correct” behavior. Even the simple representation of a norm, when couched in an appeal to change behavior, can trigger reactance and thus mitigate behavior change (Howe et al., 2021, see also Bosson et al., 2015). In contrast, effective normative appeals seem to elicit a feeling of working together toward a common cause, rather than implying pressure (Howe et al., 2021; Sparkman, Howe, et al., 2020). From a theoretical perspective, this feeling may intrinsically motivate message recipients to consistently follow the shared goal of a peer group (see Festinger, 1957; Turner, 2010). A major challenge for applying norm messages to increase women’s salaries and mitigate the gender pay bias is, therefore, to craft messages that raise awareness about HR managers’ problematic role in the gender pay gap and intrinsically motivate them to be a part of the solution, by their own accord.

The Present Research

In the present research, we examine whether (and why) egalitarian norms increase salary offers to women in seasoned HR professionals. We sought to first experimentally establish the extent of gender bias among HR professionals by comparing offers to female versus (otherwise identical) male job applicants in simulated salary negotiations. In a pilot study (a complete report of this is in the online Supplemental Materials, pp. 2–6), we found that $N = 91$ HR experts were willing to pay female candidates significantly less than male candidates, $p = .037$, $\eta_p^2 = .074$. Next, two preregistered experiments sought to replicate this bias and to test whether an egalitarian norm message would increase offers to female candidates and thereby counteract the pay bias. To further our understanding of the key aspects of the intervention, in each experiment, we compare messages that convey slightly different normative information, while similarly making the gender pay gap salient as a relevant issue for HR professionals.

Experiment 1a aimed to gauge the effect of communicating norms of desirable egalitarian behavior among HR professionals (i.e., striving toward equal pay) on salary offers to women. By comparing messages that present this behavior as the prevalent (*static*) norm or as an increasing trend (i.e., a *dynamic* norm), we aimed to gain insights into whether following the majority or being part of a movement toward change might be the more relevant motivator. To

substantiate the findings with regard to the specific cognitions that these messages may convey, we explored the extent to which the messages elicit a sense of pressure versus a feeling of working together toward a shared goal in an independent online sample (Experiment 1b).

Experiment 2 aimed to delve deeper into whether the communication of a desirable egalitarian norm is responsible for the effect or whether merely raising awareness about the undesirable norm of the societal gender pay gap suffices to increase salary offers to women. Experiment 2 also provides novel insights into the messages' effects on the gender pay bias by comparing salary offers to both men and women across conditions. We further explore the sense of pressure and feeling of working together as psychological mechanisms.

Experiment 1: Can Egalitarian Norm Messages Increase Salary Offers to Women?

Experiment 1a tested four preregistered hypotheses in an economical design of four between-subjects conditions: For the two control conditions (female vs. male candidate), we predicted that HR professionals would be biased and offer lower salaries to female than to identically qualified male candidates (H1). We additionally combined two intervention conditions with the female candidate (female + static vs. female + dynamic norm). In both conditions, participants were informed about HR professionals striving to reduce the gender pay gap. As common in the literature, the static norm described the current status quo of behavior (i.e., HR strives to reduce the gap). Recently, dynamic norm messages have gained attention; these highlight ongoing movements and changes in behavior. Message recipients may follow suit with the changes others are making rather than just continue conforming to the current status quo (Loschelder et al., 2019; Mortensen et al., 2017; Sparkman & Walton, 2017, 2019). By highlighting a positive trend, dynamic norms can promote desirable behavior that is not yet prevalent (Sparkman, Weitz, et al., 2020).

We predicted that HR professionals receiving either of the two egalitarian norm messages would offer a higher salary to female candidates compared to those in the female control group (H2), given that both explicate a desirable norm. As summarized in the introduction, people generally seek to conform to norms, unless they feel unduly pressured. Previous research has also suggested that dynamic norms can outperform desirable static norms (Sparkman & Walton, 2017, 2019) as well as undesirable static norms (Loschelder et al., 2019; Mortensen et al., 2017). Hence, one could argue that our dynamic egalitarian message may be particularly motivating compared to the static norm as it implies the opportunity to be part of a shared effort toward a meaningful change instead of solely following a prevalent norm (see also Sparkman & Walton, 2019). It follows that the dynamic norm message could increase HR professionals' offers to women relative to the control condition more than the static norm message (H3).¹

Method

Transparency and Openness

The design and analysis of Experiments 1a and 2 were preregistered (see Open Science Framework [OSF] project folder

[https://osf.io/9ewnp/]). We describe our sampling plan, all data exclusions (if any), all manipulations, and all measures in the study, and we adhered to the *Journal of Applied Psychology* methodological checklist. If not indicated otherwise, analyses were conducted with IBM SPSS for Mac OS, Version 28. The complete data, research materials, and an analysis syntax of all experiments are available in the OSF project folder. All experiments reported in this article follow the ethical guidelines of the American Psychological Association. There were no expected risks for participants involved. Therefore, they are exempt from approval by the university ethics committee.

Design and Participants

There were four between-subjects conditions: (a) male candidate, (b) female candidate, (c) female candidate plus a static egalitarian norm, and (d) female candidate plus a dynamic egalitarian norm message. We planned a minimum sample size of 180 participants to detect a medium-sized effect ($d = 0.5$; Cohen, 1988) with 80% power in this one-factorial analysis of variance (ANOVA). To account for potential exclusions, a total of 206 participants were recruited via business social media, email, or telephone. Four participants were excluded due to the preregistered outlier criterion (i.e., dependent variables $> \pm 2.5$ SDs from condition mean; results remain robust if outliers are included). The final sample consisted of 202 professionals (121 women, 80 men, 1 unreported) with a $M_{\text{age}} = 37.90$ ($SD = 11.25$) and $M = 8.25$ years of job experience ($SD = 8.18$), who conducted $M = 25.82$ salary negotiations per year ($SD = 39.74$).

Procedure and Measures

Participants were randomly assigned to a condition and all read the same moderately strong resume for an "entry-level job" (without further details). Gender was manipulated through the candidate's title ("Mr. M." or "Ms. M."). In addition, in the static norm condition HR professionals read:

Human Resource professionals help to reduce the gender pay gap. This means that those responsible in salary negotiations pay attention to the equal treatment of men and women.

This message thus conveys the norm of a *desirable* behavior (i.e., paying attention to equal treatment). The dynamic norm condition presented the same qualities as a trend instead of the current state. It read:

Over the last few years, more and more HR professionals have begun helping to reduce the gender pay gap. This means that, in recent years, those responsible for salary negotiations have changed their behavior and have paid increasingly more attention to the equal treatment of men and women.

¹ As a fourth preregistered hypothesis, we predicted that sexist beliefs (modern sexism; Eckes & Six-Materna, 1998) would moderate the effects. We predicted that (a) the gender bias would be less pronounced and (b) egalitarian norm messages would be more effective among recipients with lesser sexist beliefs (H4). This hypothesis was preregistered to consider a potential boundary condition. However, the sample size was planned for the main effects rather than the interaction; due to space constraints, we thus report the results of this underpowered analysis in the online Supplemental Materials.

Dependent Measures. There were two primary dependent measures. First, we assessed participants' counteroffers to the salary the candidate envisioned. Second, we assessed the maximum salary they would be willing to pay (WTP) the candidate. A bias on either measure could suffice to result in a lower negotiated salary of women compared to men. Additionally, to explore gender role perceptions, participants rated the job candidate with respect to agentic (i.e., competent, efficient, clever; $\alpha = .644$) and communal characteristics (i.e., sincere, honest, fair toward others; $\alpha = .866$; 1 = *not at all* to 7 = *absolutely*; Wojciszke et al., 2009). Participants also rated how likely (1 = *not at all* to 7 = *very likely*) they were to hire the candidate to ensure he or she was a realistic candidate. Three exploratory items assessed the extent to which participants consciously followed a norm to reduce the pay gap and five items assessed modern sexism (Eckes & Six-Materna, 1998, for details, see online Supplemental Materials). Finally, participants reported demographics and the typical starting salary in their company (preregistered covariate, open ended). The data set is complete on all measures except for two missing values for typical starting salary.

Results

Salary Offers

Corroborating that the typical starting salary in participants' own companies ($M = €41.17$ k, $SD = 6.07$, range: €24 k–€60 k) accounted for variance in salary offers, it correlated with counteroffers, $r = .42$, $p < .001$, and WTP, $r = .39$, $p < .001$. As preregistered, we hence conducted analyses of covariance (ANCOVAs) with the typical starting salary as a covariate. Participants' counteroffers differed significantly across conditions, $F(3, 195) = 3.55$, $p = .015$, $\eta_p^2 = .051$. Figure 1 shows the group means, as well as effect sizes and Bayesian statistics for group differences to allow for a better interpretation of the extent to which the empirical data provide trustworthy evidence for both significant differences and null findings—the higher the Bayes factors (BFs), the stronger the evidence.² In line with H1, the male candidate received significantly higher counteroffers than the female candidate without a norm message, $d = 0.40$, 95% (as for all following CIs) CI [0.01, 0.76]. In line with H2, counteroffers to female candidates were significantly higher after the dynamic, $d = 0.57$, CI [0.17, 0.97], and after the static norm message, $d = 0.45$, CI [0.05, 0.85]. Contrary to H3, the descriptive advantage of the dynamic norm was not significant, $d = 0.18$, CI [–0.57, 0.91]. WTP did not show significant effects, $F(3, 195) = 0.84$, $p = .476$, $\eta_p^2 = .013$.³

Exploratory Analyses

The exploratory measures further reveal that bias in counteroffers emerged *without* marked differences in how agentic, communal, and hireable female and male candidates appeared (see group means of all measures in Table 1). Exploratory analyses also showed no significant moderating effect of participant gender (see the online Supplemental Materials, Table S8).

Supplementary Exploratory Experiment 1b

To further explore the effectiveness of this manipulation and the psychological processes the two norm messages elicited, we conducted a brief online experiment (Experiment 1b) with a general population sample recruited via “Academic Prolific” ($N = 202$). The

study used the same four conditions as Experiment 1a. The dependent variables (details in the online Supplemental Materials) were (a) a manipulation check—the degree to which participants perceived the norm to be changing; and (b) measures for the presumed underlying processes—the feeling of working toward a shared goal and of social pressure (adapted from Howe et al., 2021). If both messages elicit similar levels of the key psychological process, their different phrasing may be less crucial for their effect on salary offers. Results show that the perception of a *changing* norm was indeed higher in the dynamic norm condition than in the female control and female plus static norm conditions, $ps < .037$. The feeling of a shared goal was increased by both norm messages (compared to the control condition), $ps < .046$; the two interventions did not differ, $BF_{01} = 4.46$, $p_{(\text{difference})} = .675$. Perceived pressure did not differ across conditions, $ps > .054$ (Table S9 in the online Supplemental Materials).

Discussion

Experiment 1a corroborates the relevance of gender bias for the gender pay gap. A sample of experienced HR professionals offered more money to a male candidate than to an otherwise identical female candidate. Promisingly, both egalitarian norm interventions, a desirable static and a dynamic norm, increased salary offers to female candidates to the level of the offers to men. The two egalitarian norm messages did not differ significantly. The exploratory Experiment 1b further showed that, while participants did pick up on the emphasis of change in the dynamic norm condition, both norm messages elicited a similarly strong feeling of working toward a shared goal. This result pattern suggests that an effective norm intervention elicits the feeling of a shared goal but not that portraying egalitarian behavior as an emerging trend uniquely creates this feeling. This feature of both messages—suggesting the shared goal of equal pay—might be more crucial than their respective static or dynamic nature. However, the present findings might also be due to both messages implicitly raising awareness of pay inequalities or by simple demand effects.

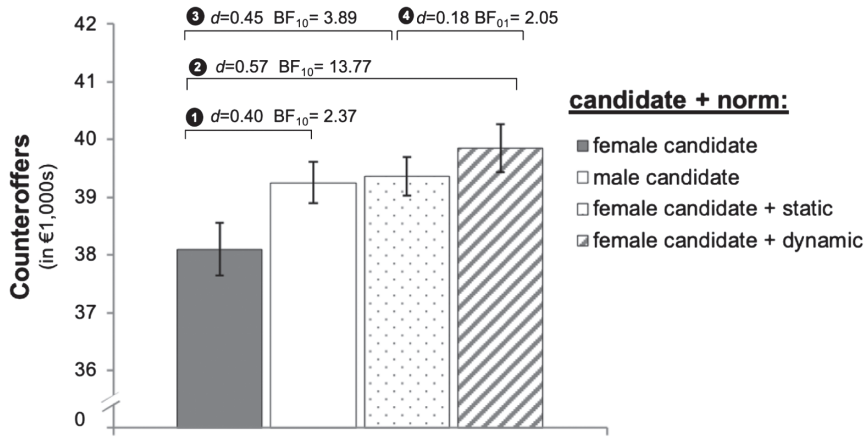
Experiment 2: How Do Egalitarian Norms Improve Salary Offers to Women?

Focusing on the dynamic norm, Experiment 2 sought to replicate the egalitarian norm effect and to provide further insights into five

² Bayes factors were calculated with the software JASP (JASP Team, 2020). For each pairwise contrast, a Bayesian t test was calculated with a default Cauchy prior of 0.707 (for details on parameters, see the online Supplemental Materials). For directional preregistered hypotheses, a directed H_1 was tested against the H_0 of no effect. For exploratory group differences, H_1 reflects a nondirectional difference in any direction and H_0 again no effect. BF_{01} represents the factor by which H_0 is more likely than H_1 and thereby allows for empirical evidence in favor of the null hypothesis (other than the more common frequentist analyses). BF_{10} represents the factor by which H_1 is empirically supported more likely than H_0 . As common conventions to interpret Bayesian evidence, $BFs > 1$ and < 3 reflect “anecdotal” evidence, $BFs > 3$ and < 10 indicates “moderate” evidence, and $BFs > 10$ “strong” evidence for the predicted difference (BF_{10}) or null effect (BF_{01}), respectively (Jeffreys, 1961; Lee & Wagenmakers, 2013).

³ Our H4 regarding the moderation by sexism was supported for the dynamic norm message, to which participants with less sexist beliefs were more responsive than participants with more sexist beliefs (see the online Supplemental Materials). Sexist beliefs did not predict the general gender bias or the responsiveness to the static norm (possibly due to insufficient power).

Figure 1
HR Professionals' Counteroffers as a Function of Intervention Condition in Experiment 1a



Note. HR = Human Resources; BF = Bayes factors. HR professionals' counteroffers as a function of candidates' gender (male "Mr. M." vs. female "Ms. M.") and the egalitarian norms intervention (female + static norm and female + dynamic norm). Bars represent the means after partialling out variance introduced by the typical starting salary in participants' companies. Error bars indicate ± 1 standard error of the mean (SEM). The Bayes factors (BF_{10}) indicate how much the data empirically supported (a) the existence of the hypothesized group difference more than the null hypothesis (BF_{10}) or (b) the null hypothesis more so than a group difference (BF_{01} ; i.e., "evidence of absence").

ways: First, it is possible that mere awareness of the problem, as opposed to a desirable behavioral norm to solve it, could already shift behavior. According to dual-processing models, increasing awareness of gender bias might trigger more elaborated processing of individual candidate information and could thus counteract it (e.g., Fiske & Neuberg, 1990). Therefore, Experiment 2 compared a condition in which recruiters were merely informed about the size and roots of the gender pay gap to one that additionally included an egalitarian norm.⁴ Second, we sought to mitigate demand effects by presenting the intervention messages through a newspaper article chosen by participants. Third, we further explored participants' feelings of a shared goal as a potential process by which the dynamic norm message increases offers to women, as well as the social pressure they perceived as a potential barrier (see Howe et al., 2021). Fourth, we used a fully crossed experimental design to explore how the interventions affect offers to women and men, as well as the gender difference. The increase in offers to women (and any change in offers to men) across conditions sheds light on the kind and extent of change that HR professionals deem necessary to eliminate the gender pay gap. The discrepancy in offers to men and women within each condition tells us how the gender bias varies as a function of the intervention. Fifth, we described the candidate's envisioned salary and a dependent measure without using monetary numbers, simplifying the assessment of salary offers across different field-specific standards and countries. Finally, we recruited a sample of professionals with hiring experience from the USA, U.K., and EU.

Preregistered Hypotheses

As in Experiment 1a, we predicted that women would be offered lower salaries than men in the control group (H1) and that the dynamic norm message would increase offers to women relative to

the control condition (H2). We preregistered competing predictions for the awareness condition: On the one hand, increasing awareness of potential bias might interrupt the automatic categorical processing of candidate information that could be the root of gender bias (Fiske & Neuberg, 1990). If this were a major mechanism by which egalitarian messages increase offers to women, then offers in the awareness condition should resemble those in the egalitarian norm condition and differ from the control condition (H3a). On the other hand, raising awareness might only make the descriptive, undesirable norm of unequal pay salient (Duguid & Thomas-Hunt, 2015). If this is not coupled with an egalitarian norm that motivates HR professionals to jointly and intentionally pursue equality, then offers to women in the awareness condition should resemble the control condition; hence, the dynamic norm condition would have a stronger effect than mere awareness (H3b).

Method

Design and Participants

Experiment 2 used a fully crossed 2 (candidate gender: male vs. female) \times 3 (intervention: control vs. awareness vs. dynamic norm) design. We recruited HR experts from various companies in the USA, U.K., and EU ($n = 73$), as well as professionals with hiring experience via the platform Prolific ($n = 188$). An a priori power analysis showed that a power of $1 - \beta = .80$ for a moderate

⁴ We used a dynamic norm here because it descriptively led to the largest increases in offers to women in Experiment 1. However, as Experiment 1a suggested, this dynamic aspect might be less crucial than the implied shared goal (see the psychological mechanism tested in Experiment 2). For full transparency, we refer to the construct as an egalitarian norm and the specific operationalization as a dynamic egalitarian norm.

Table 1*Means (M) and Standard Deviations (SD) as a Function of Condition in Experiment 1a*

Dependent variable	Female candidate (<i>n</i> = 50)		Male candidate (<i>n</i> = 51)		Female candidate + static norm (<i>n</i> = 51)		Female candidate + dynamic norm (<i>n</i> = 50)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Counteroffer (in €)	38096.70 _a	3213.67	39250.50 _b	2516.47	39363.96 _b	2366.82	39843.44 _b	2906.30 _b
Willingness to pay (in €)	41722.65 _a	3314.92	42185.97 _a	3653.09	42569.93 _a	3261.83	42671.48 _a	3016.50
Agency rating	4.31 _a	0.81	4.32 _a	0.72	4.55 _a	0.77	4.58 _a	0.78
Communion rating	4.53 _a	0.84	4.31 _a	0.88	4.67 _b	0.75	4.92 _b	0.92
Hiring probability	4.84 _a	1.18	4.61 _a	1.28	4.76 _a	1.52	4.88 _a	1.33

Note. *SD* = standard deviation; HR = Human Resources; WTP = willing to pay. Means in the same row not sharing the same subscript differ significantly at $p < .05$ in a two-sided test. The values in the tables reflect HR professionals' counteroffers and WTP corrected for the typical starting salary in participants' own companies (calculated as nonstandardized residuals from a regression + intercept). Agency (competent, clever, and efficient) and communion (sincere, honest, and fair) refer to positive attributes ascribed to the candidate.

interaction effect of $\eta_p^2 = .04$ in a 2×3 between-subjects ANOVA required 235 participants (Faul et al., 2007). After excluding 15 participants who failed the reading check (i.e., recalled the wrong candidate gender after the experiment), the final sample size was $N = 246$ (156 women, 87 men, 3 nonbinary), with a $M_{\text{age}} = 43.63$ ($SD = 11.24$), and including complete data on all analyzed measures. Participants had, on average, 8.06 years ($SD = 9.02$) of working experience and conducted 12.10 ($SD = 30.92$) salary negotiations per year.

Procedure, Manipulation, and Measures

After providing informed consent, participants were randomly assigned to an experimental condition. They were asked to choose, read, and rate (1–5 stars) a short newspaper article ostensibly from the *Washington Post*, *New York Times*, or *San Francisco Chronicle*. Regardless of the outlet chosen, participants read the same article (in the corresponding newspaper layout), which contained the manipulation. In the control condition, the article was unrelated to the pay gap but described the benefits of taking naps. In the awareness condition, the article stated that a gender pay gap of 23%–24% continues to exist for various reasons, including men's and women's professional choices and also HR managers' gender bias. The article thus communicated a descriptive norm, framed it as a problem, and listed several underlying causes. In the dynamic norm condition, the article was identical to the awareness condition but added one sentence at the end:

Importantly, things have been changing at the negotiation table: over the last few years, more and more HR recruiters have made pronounced efforts to overcome the gender pay gap, and increasingly more HR departments strive towards a fair payment.

Next, participants were asked to assume the role of an HR manager of a medium-sized company. They were told they were in the final stages of the hiring process of a candidate “Ms. M.” (or “Mr. M.”; described as in Experiments 1a and b) and asked to briefly note a few thoughts on how the candidate came across to ensure they deliberated on the description. For the pending salary negotiation, they were given a scale that illustrated the range of starting salaries for the open position. This range included indicators for the upper and lower salary bound but did not

include specific (numbered) values. Participants learned that the candidate had communicated their envisioned salary, indicated by an arrow pointing just below the upper bound of the typical range.

Dependent Measures. Participants were asked to indicate their counteroffer by clicking on the candidate's envisioned salary and then sliding it to their desired position on the vertical scale (range: 0–100). We developed this measure to allow for comparison across sectors, countries, and currencies while minimizing the impact of participants' own typical starting salaries (see covariate in Experiment 1a). To allow us to still gauge the monetary value of their offers, participants noted the absolute salary they had thought of when making their counteroffer, as well as the maximum they were WTP (absolute values in participants' chosen currency). To make these comparable, all values were transformed to Euro at the current exchange rate.

Psychological Mechanisms. We included two measures adapted from Howe et al. (2021). Three items captured participants' feelings of working with others toward a common goal to reduce the gender pay gap, a potential mechanism of norm messages (e.g., “I felt that I can be a part of a movement—together with other HR decision-makers—to counteract the gender pay gap”; 1 = *not at all* to 7 = *very much*, $\alpha = .88$). Three items measured how much social pressure participants felt to change their behavior, a potential barrier of norm message interventions (e.g., “I felt pressured by the information given in this study to change my negotiation behavior”; 1 = *not at all* to 7 = *very much*, $\alpha = .90$).

Manipulation Checks. A manipulation check assessed perceptions of a dynamic norm (“Over the last few years, more and more HR recruiters have made pronounced efforts to overcome the gender pay gap, and increasingly more HR departments strive toward a fair payment”; 1 = *very untrue* to 7 = *very true*). As a manipulation check for awareness of the size of the gender pay gap, we asked participants for an estimate of its size (ranging from 1 = *equal pay* to 7 = *women earn over 25% less than men*; in increments of 5%). The survey further included a few open-ended and rating questions (mostly serving filler and distractor functions, see original materials on OSF) and demographic questions. Finally, participants were thanked and offered further information on the study. A reading check assessed the candidate's perceived gender (correct answers were required).

Results

Manipulation Checks

An intervention main effect reflected that, compared to the control condition ($M = 4.05$, $SD = 1.61$), the norm message increased participants' perception of a dynamic egalitarian trend ($M = 4.80$, $SD = 1.49$), $d = 0.48$, $CI [0.17, 0.80]$, but the awareness condition did not ($M = 4.26$, $SD = 1.28$), $d = 0.14$, $CI [-0.16, 0.45]$, $F(2, 240) = 6.29$, $p = .002$, $\eta_p^2 = .050$. An unexpected main effect of candidate gender also emerged, $F(1, 240) = 5.83$, $p = .016$, $\eta_p^2 = .024$, as HR professionals perceived a stronger egalitarian trend in the male (sic) than female candidate conditions, as well as an interaction, $F(2, 240) = 3.26$, $p = .040$, $\eta_p^2 = .026$, indicating that the norm increased these perceptions particularly in the female candidate condition (for details, see the online Supplemental Materials).

As expected, the intervention also had a significant effect on the perceived size of the gender pay gap, $F(2, 240) = 23.45$, $p < .001$, $\eta_p^2 = .163$. Compared to the control condition ($M = 4.58$, $SD = 1.33$), both the awareness ($M = 5.74$, $SD = 0.76$), $d = 1.07$, $CI [0.74, 1.41]$, and the dynamic norm intervention ($M = 5.51$, $SD = 1.29$), $d = 0.71$, $CI [0.39, 1.03]$, significantly increased this perceived size. There was no effect of candidate gender, $F(1, 240) = 0.56$, $p = .457$, $\eta_p^2 = .002$, or interaction, $F(2, 240) = 0.756$, $p = .471$, $\eta_p^2 = .006$.

Salary Offers

Corroborating that our vertical salary scale successfully measured salary offers without being affected by participants' prior expectations of the typical starting salary (see covariate in Experiment 1), the two did not correlate, $r < .001$, $p = .992$. A 2×3 ANOVA on participants' counteroffer (in %) revealed a significant candidate Gender \times Intervention interaction, $F(2, 240) = 8.41$, $p < .001$, $\eta_p^2 = .065$, with no main effects of gender, $F(1, 240) < 0.01$, $p = .987$, $\eta_p^2 < .001$, or intervention, $F(2, 240) = 0.817$, $p = .443$, $\eta_p^2 = .007$ (see Table 2, for means).⁵ Figure 2 illustrates the pattern of offers that this interaction reflects. Supporting H1 and replicating Experiment 1a, female candidates received lower offers than male candidates without an intervention, $d = 0.56$, $CI [0.12, 1.00]$, $BF_{10} = 14.56^2$ ("strong" Bayesian evidence; Jeffreys, 1961; see Figure 2 [Contrast 1]).

To disentangle how the two interventions moderated this gender bias effect, we first calculated a 2 (dynamic norm vs. control) \times 2 (male vs. female candidate) ANOVA (see the online Supplemental Materials, Table S13). This showed that the dynamic norm substantially changed—and actually reversed—the gender bias, $p < .001$, $\eta_p^2 = .096$, in that participants now made significantly higher offers to female than to male candidates, $d = 0.73$, $CI [0.28, 1.19]$, $BF_{10} = 23.51$ ("strong" evidence; Figure 2 [Contrast 3]). Supporting H2, offers to female candidates increased markedly after the norm intervention, compared to the control condition, $d = 0.80$, $CI [0.34, 1.26]$, $BF_{10} = 17.25$ ("strong" evidence; Figure 2 [Contrast 6]). However, the dynamic norm also unexpectedly reduced offers to male candidates compared to the control condition, $d = 0.47$, $CI [0.04, 0.91]$, $BF_{10} = 3.28$ ("moderate" evidence; Figure 2 [Contrast 9]).

A second 2 (awareness vs. control) \times 2 (male vs. female candidate) ANOVA showed that awareness did not significantly reduce (nor reverse) the gender bias as would be evident in an interaction effect, $p = .190$, $\eta_p^2 = .011$ (see the online Supplemental Materials, Table S13). Nevertheless, the gender bias was no longer significant in the awareness condition, $d = 0.13$, $CI [-0.30, 0.57]$, suggesting fairly

equal treatment of men and women, given the "moderate" Bayesian evidence for the null finding, $BF_{01} = 3.70$ (Figure 2 [Contrast 2]). Viewed differently, offers to women were not significantly increased in the awareness compared to the control condition, $d = 0.38$, $CI [-0.07, 0.82]$, $BF_{10} = 1.48$ (Figure 2 [Contrast 4]; counter to H3a), nor were offers to men reduced ($BF_{10} = 0.25$; Figure 2 [Contrast 7]). The predicted increase in female salary in the dynamic norm condition beyond the awareness condition (H3b) was also not significant, $d = 0.44$, $CI [-0.01, 0.88]$, $BF_{10} = 2.35$ (Figure 2 [Contrast 5]).

Robustness of Effects

Two preregistered analyses reported in the online Supplemental Materials show, first, the robustness of these effects when excluding two outliers. Second, the interaction effect became even more pronounced when excluding three participants who rated the newspaper article with fewer than three out of five stars (as preregistered). To test the robustness of findings across measurements, we also conducted 2×3 analysis of (co)variance (AN(C)OVAs) with the monetary measures of counteroffer and WTP. These showed similar and significant patterns of effects when including participants' selected currency (€, U.S.\$, or £Sterling) as a covariate (means in Table 2, full report in the online Supplemental Materials).

Exploratory Mediation Analyses

As a correlational exploration of possible mechanisms by which the interventions affect offers to female and male candidates, we conducted the following moderated mediation analysis using the PROCESS macro (Hayes, 2013, Model 8, 5,000 bootstrapped samples; Figure 3): Condition was entered as a multicategorical independent variable (creating two dummy variables: awareness vs. control and dynamic vs. control), candidate gender as the moderator, and counteroffer as the dependent variable. Participants' feelings that they were working together toward a shared goal and their experience of social pressure to change their behavior served as multiple competing mediators (for group means of mediators, see Table 2). In the female candidate condition, the dynamic norm effect was mediated by increased feelings of working toward a shared goal, $b = 2.39$, bootstrapped $CI [0.31, 5.36]$, whereas the detrimental effect in the male candidate condition was not, $b = -0.08$, $CI [-1.92, 1.45]$, index of moderated mediation -2.47 , $CI [-6.25, -0.04]$. Feelings of pressure did not mediate the effect for either gender, $b_{\text{female}} = -0.10$, $CI [-0.99, 0.44]$, $b_{\text{male}} = 0.34$, $CI [-0.47, 1.80]$, index of moderated mediation $= 0.44$, $CI [-0.50, 2.40]$. The awareness intervention, in contrast, had no effect on mediators, $ps > .40$, and no indirect conditional or moderated effects on the outcome via either path (see the online Supplemental Materials for details).

Discussion

Experiment 2 conceptually replicates both the gender bias in salary offers to men and women, as well as the dynamic norm message effectively increasing offers to women. These results were robust across several variations in analyses. Moreover, the results provide further insights into whether raising pay gap awareness suffices to

⁵ Participant gender did not significantly affect salary offers nor interact with the other factors (see the online Supplemental Materials, Table S19).

Table 2*Means (M) and Standard Deviations (SD) as a Function of Condition in Experiment 2*

Dependent variables	Intervention					
	Control		Awareness		Dynamic egalitarian norm	
	Female (n = 40)	Male (n = 43)	Female (n = 40)	Male (n = 41)	Female (n = 41)	Male (n = 41)
Counteroffer (in %)						
M	33.30 _a	43.91 _b	40.15 _{a,b}	42.78 _{a,b}	48.71 _b	35.59 _a
SD	17.78	19.94	18.60	20.96	20.53	14.76
Counteroffer (in €)						
M	35334.00 _{a,c}	37522.33 _{a,b}	37595.50 _{a,b,c}	36173.41 _{a,b,c}	38405.85 _b	35259.02 _c
SD	6522.24	5239.16	13557.33	5555.33	5146.45	3501.76
Willingness to pay (in €)						
M	39455.25 _a	42173.02 _{a,b}	40754.50 _{a,b}	39994.63 _{a,b}	42386.83 _a	39167.32 _b
SD	7978.77	8341.07	13233.08	5747.31	5630.90	4385.82
Feelings of shared goal						
M	3.58 _a	4.40 _b	3.97 _{a,b}	4.50 _b	4.68 _b	4.36 _{a,b}
SD	2.05	1.64	1.91	1.94	1.72	1.62
Feelings of pressure						
M	2.09 _a	2.18 _a	2.45 _{a,b}	2.33 _{a,b}	1.97 _a	2.60 _b
SD	1.34	1.29	1.46	1.52	.93	1.62

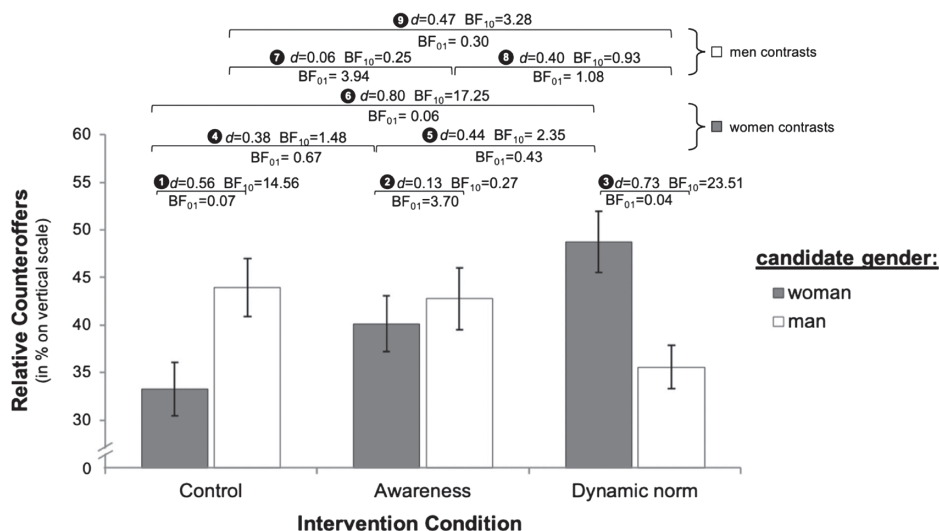
Note. SD = standard deviation. Values in the same row and not sharing the same subscript differ significantly at $p < .05$ in a two-sided test. Counteroffer (in %) is the primary dependent measure. Counteroffer (in €) reflects the absolute monetary value that participants had in mind for this measure. Willingness to pay (in €) reflects the maximum they would be willing to pay the respective candidate.

increase offers to women. Offers to women in the awareness condition were not significantly higher than in the control condition but were also not significantly lower than in the egalitarian norm condition.

An exploratory mediation analysis, building on Experiment 1b, showed that the pay increase to women in the egalitarian norm condition was mediated by a greater feeling among participants of working together toward pay equality. There was no (detectable)

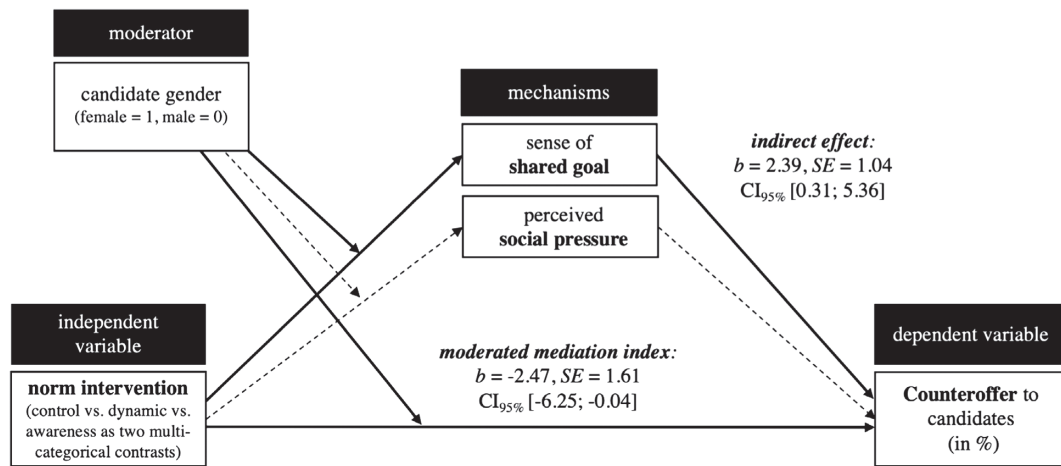
effect of awareness on this feeling nor an indirect effect on offers to women, suggesting that this motivating feeling may be a mechanism specific to the egalitarian norm intervention. Neither intervention was perceived as exerting social pressure, hence, psychological reactance seems unlikely for both.

The full-factorial design further allowed us to explore how each intervention affects gender bias. Notably, there was no significant

Figure 2*Counteroffers to Men and Women as a Function of Intervention in Experiment 2*

Note. BF = Bayes factors. Counteroffers as a function of candidates' gender (male "Mr. M." vs. female "Ms. M.") and the intervention (control vs. awareness of the pay gap and bias vs. dynamic egalitarian norm). Bars represent participants' counteroffers (in %) on a vertical scale. Error bars indicate ± 1 standard error of the mean (SEM). Contrasts [1]–[9] compare the respective conditions of interest, including Cohen's d effect sizes and Bayes factors. The latter quantify the extent to which the data empirically supported (a) the existence of the hypothesized group difference more than the null hypothesis (BF_{10}) or (b) the null hypothesis more than a group difference (BF_{01}).

Figure 3
Moderated Mediation Model in Experiment 2



Note. CI = confidence interval. The model tests whether the effect of (a) the awareness intervention and (b) the dynamic norm intervention affected participants' counteroffers via the mediators shared goal and social pressure, and whether this mediation and the direct effect are moderated by candidate gender. The significant moderated mediation index (i.e., CI excluding zero) refers to the effect of dynamic norm via shared goal that is moderated by gender. The indirect effect refers to the conditional indirect effect of the dynamic norm via shared goal on counteroffers to female candidates. The dashed lines show nonsignificant paths—perceived social pressure did not mediate. Full results are reported in the online Supplemental Materials.

difference in offers between men and women in the awareness condition, though there was also no significant reduction of bias in the awareness condition compared to the control condition. In contrast, the significant moderation of gender bias in the egalitarian norm condition reflects an unexpected and noteworthy finding of a reversal of bias—the egalitarian norm not only increased offers to women but also inadvertently decreased offers to men such that women were given significantly higher offers than men.

General Discussion

In two experiments, we found that experienced HR professionals offered less money to a female than to an identical male candidate. Yet, this underpaying of women is not inevitable. A dynamic egalitarian norm message (“more and more HR recruiters are making increasing efforts to overcome the gender pay gap”) increased offers to female candidates (Experiments 1a and 2) and, unexpectedly, decreased offers to men (Experiment 2). These changes in gender-specific offers, each by itself, would have been sufficient to eliminate the gender pay bias; in sum, they inadvertently reversed it. Exploratory findings suggest that the intervention increased the feeling of working together for a shared goal of gender equity (Experiments 1b and 2), which partially mediated increased offers to women (Experiment 2). A static egalitarian norm message also increased this shared goal (Experiment 1b) and offers to women (Experiment 1a), suggesting that the dynamic phrasing may not be indispensable for the effectiveness of an egalitarian norm intervention. Merely raising awareness of the gender pay gap resulted in a pattern where women received intermediate offers, neither significantly higher than in the control condition nor lower than in the egalitarian norm condition (Experiment 2). The question of whether increased awareness can explain egalitarian norm effects thus cannot be answered conclusively, though awareness seems to play a partial role. Interestingly, Experiment 2 shows no significant difference in offers to men and

women after merely raising problem awareness. Though, the data fall short of revealing a significant reduction in bias in the awareness condition as compared to the control condition. Taken together, problem awareness seems to remove gender bias, though the confidence in this finding is moderate based on the present data (and Bayesian analyses).

Limitations and Applied Implications

As noted, we observed that women were paid more than men in the egalitarian norm condition in Experiment 2. While egalitarian norm messages appear to be an effective way to raise women’s wages, we also wish to urge caution when applying dynamic egalitarian norm messages as they may inadvertently create a novel gender bias favoring women. Further exploring this effect and its boundaries is an important direction for future research. For instance, it could result from an honest attempt to reduce bias. Perhaps participants offered men less in an attempt to match the amount they expected women would be offered. Indeed, offers to men in the norm condition did not differ from offers to women in the control condition. In addition, by design, paying the male candidate less was the only way professionals in the male candidate condition could contribute to reducing the societal pay gap—just as paying the female candidate more was the only way those in the norm condition evaluating women could contribute. Absent criteria on how to translate objective qualifications into pay and with only one person to negotiate with, the message may not have been specific enough on *how* to be unbiased to women and men. In sum, this may have led to an overcorrection specific to the present design. Finally, in the present work, participants were only informed about the size of the *unadjusted* gender pay gap and the (undefined) partial role of bias in it. Ambiguity about the magnitude of the bias or the attempt to counteract inequality more broadly could lead people to overcorrect. Further research would be needed to fine-tune

the message to ensure a reversed injustice was not created. Future messages could, for instance, suggest a trend toward using gender-fair, criterion-based reference standards when making salary offers. The development of guidelines for fair procedures for negotiating salaries in a company could provide the know-how that, consequently, more and more HR professionals could become motivated to implement. Further research should also seek to specify how, when, and how frequently in the process of hiring and negotiating salaries, companies could send norm messages to their HR employees to foster sustainable change (e.g., Murrar et al., 2020; Sparkman, Weitz, et al., 2020, for related work). While small interventions can have enduring effects (Walton & Wilson, 2018), it could be that messages like ours do not foster sustainable change (Hertwig & Grüne-Yanoff, 2017) but need to be presented continuously (or repeatedly) to have a lasting effect (De Dominicis et al., 2019). They may need to include updated information about the progress made toward a shared goal such as pay equality.

When using survey experiments, experimenter demand is always a possible alternative explanation. Many steps were taken to reduce demand in Experiment 2, including masking the experimenters' intentions by having participants ostensibly choose an article to read, by having that article note nonbias reasons for the gender pay gap (e.g., women's career choices), and by providing several distracting factors (beyond gender) for participants to base their offers on. But ultimately, one would need a field experiment with actual hires to clarify if these messages translate to real-world hiring outcomes and to help rule out that experimenter demand played a role here.

Conclusions

The present research shows that HR professionals—those who matter for the pay gap—make lower offers to women than to men. Our research also identifies egalitarian norm messages as a means to increase women's salaries—possibly, however, at the cost of establishing an inadvertent bias reversal. Exploratory evidence shows that creating a feeling of working together toward change is a psychological mechanism the effect of egalitarian norms to increase women's salaries. In sum, norm messages that lead HR professionals to pay attention to more equitable behavior may be a way to reduce the gender pay gap that undervalues women's labor without placing the burden of change on women. In any case, we are hopeful that by developing interventions such as we did, it may take less than 135 years for women to earn as much as men.

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Received August 31, 2020

Revision received May 30, 2022

Accepted June 8, 2022 ■