

Climate change: An increase in norms for inclusion predicts greater fit and commitment for women in STEM

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Abstract

In male-dominated STEM fields, workplace culture is often cited as a factor for women's attrition. In the present research, we used longitudinal field data to examine how changes in the perceived normative support for gender-inclusive policies and practices over 6 months relate to changes in women's and men's experiences of fit and commitment to their organization. Longitudinal analyses of survey data from a sample of 181 engineers revealed that increased perceptions of support for gender-inclusive policies and practices predicted increased organizational commitment only among women, an effect that was mediated by an increase in organizational value fit. Additional analyses suggest that perceptions of change in normative attitudes toward inclusive policies were more predictive of women's organizational commitment than the awareness that the policies were in place or that one has personally benefitted from them. The implications of an inclusive workplace culture for supporting women's retention in STEM are discussed.

Keywords

fit, gender, norms, STEM, workplace culture

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Introduction

Inclusive policies and practices have the potential to promote procedural justice and positive intergroup dynamics in the workplace (Nishii, 2013). These institutional policies and practices can be supported by organizational norms (Schein, 2010; Schmader et al., 2020). However, inclusive policies and practices can sometimes be met with resentment and reactance (Thomas & Plaut, 2008). Thus, although past evidence suggests that inclusive policies in an organization relate to

more positive outcomes for women in male-dominated workplaces (Hall et al., 2018), they

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might only be effective if the people in the organization actually support and endorse them (Tankard & Paluck, 2016). In the present work, we investigated the extent to which women's (and men's) organizational fit and commitment in male-dominated STEM fields are predicted by changes in perceived support from others for gender-inclusive policies and practices.

Fostering Inclusion in STEM

The importance of inclusive organizational cultures has been well documented (Emerson & Murphy, 2014, 2015; Hogg & Terry, 2000; Kalokerinos et al., 2014; Kang & Inzlicht, 2014; Murphy & Walton, 2013; Roberson & Kulik, 2007; von Hippel et al., 2011; Walton et al., 2015). Empirical studies have documented the importance of organizational signals of inclusion for employees with marginalized identities (e.g., Apfelbaum et al., 2016; Hall et al., 2018; Kaiser et al., 2013; Purdie-Vaughns et al., 2008). In male-dominated STEM fields, evidence of a sometimes negative culture for women has been documented in both qualitative (Baird, 2018; Cardador, 2017; Charleston et al., 2014; Hart, 2016; Jaime, 2010; Lester, 2010; Marco-Bujosa, 2021; Ong et al., 2018; Ruder et al., 2018; van Oosten et al., 2017) and quantitative work (Emerson & Murphy, 2015; Hall et al., 2015, 2018; von Hippel et al., 2011). For example, interview and focus-group data reveal that women in STEM often report experiencing social isolation, difficulty gaining respect, and gender stereotyping (e.g., Baird, 2018; Cardador, 2017; Marco-Bujosa et al., 2021; Seron et al., 2016). Daily diary studies reveal that women working in STEM organizations report experiencing a lack of respect and acceptance in their interactions with male colleagues, which predicts higher rates of burnout (Hall et al., 2015, 2018). These experiences represent an unwelcoming organizational culture, especially in fields such as engineering, which can lead to the turnover of talented employees (Fouad et al., 2017; Seron et al., 2016).

Efforts to increase women's success have led organizations to adopt policies and practices aimed to promote gender equity, diversity, and inclusion (Kalev et al., 2006). For underrepresented groups, efforts to increase diversity using recruitment programs, mentoring, and accountability can increase the representation of women and minorities in organizations (Kalev et al., 2006). But in addition to the tangible benefits these policies might bring about, these initiatives may be perceived, especially by women, as organizational efforts to support their success. For anyone, but perhaps especially those at risk of feeling marginalized, signals of support predict employee performance, commitment, and motivation (Cai et al., 2018; Tsui et al., 1997; van Beurden et al., 2017), and reduce interpersonal conflict and turnover (Grover & Crooker, 1995; Nishii, 2013). Thus, inclusive policies can have both realistic benefits for diversity and more symbolic benefits for inclusion.

Norms for Inclusion

These prior findings suggest how inclusive policies might confer benefits for women in STEM. However, merely having inclusive policies in place may only benefit women if others in the organization have positive attitudes about these policies. Research showing that women experience STEM workplaces as unsupportive (e.g., Cardador, 2017; Hart, 2016; Lester, 2010) suggests that inclusive policies will do little good if the interpersonal culture is negative. Thus, distinct from the personal benefit of the program itself, normative support for the policies might be its own diagnostic signal of a broader culture of inclusion that should have implications for women's outcomes.

Within any setting, people look to others to understand the social norms of that context (Asch, 1956; Reno et al., 1993), and the perceived attitudes of others predict one's own sense of fit and motivation (Masters et al., 2017; Walton & Carr, 2012). Those who are marginalized in a domain might be particularly sensitive to signals of their fit (Cheryan & Markus, 2020; Murrar et al., 2020; Schmader & Sedikides, 2018). Even

in the absence of explicitly biased attitudes, people sometimes exhibit symbolic prejudice toward policies aimed at benefitting marginalized groups (Henry & Sears, 2002). Thus, women working in male-dominated STEM fields might look to others' attitudes towards gender-inclusive policies and practices to discern how they are viewed (Schmader et al., 2015; Steele, 1997). Believing that others are unsupportive of these policies might signal a lack of "identity safety" (Hall et al., 2018; Murrar et al., 2020; Schmader & Sedikides, 2018) that could decrease women's fit and commitment (Walton & Carr, 2012).

Moreover, people also have beliefs about how norms change over time, with implications for their own behavior (Sparkman & Walton, 2017). Attitudes about bias and inclusion are malleable (Neel & Shapiro, 2012), and thus perceiving a change in support for inclusive policies might itself predict changes in women's commitment to their organization. For these reasons, a central goal of this project was to examine how dynamic norms, measured as a change in perceived support for gender-inclusive policies over a 6-month time period, predict women's and men's commitment to their organization.

How Inclusive Norms Signal Fit

A second goal was to better understand why a change in perceived support for inclusion might predict changes in women's organizational commitment. People are attracted to and thrive in settings that signal fit, and self-select out of those that do not (Schmader & Sedikides, 2018). Specifically, people are more committed to their organization when they feel a fit with organization's values (Hoffman & Woehr, 2006; Kristoff-Brown et al., 2005; Rayton et al., 2019; Silverthorne, 2004; Verquer et al., 2003), to their skillset (Carless, 2005), and to their colleagues (Grant, 2007; Humphrey et al., 2007; Morgeson & Humphrey, 2006). Perceived fit could predict commitment for anyone, but changes in the gender inclusiveness of an organizational culture could especially cue fit for women in STEM.

In particular, changing norms of inclusion might be most likely to signal value fit. STEM professionals choose their career based directly on its fit with their values (Adedokun et al., 2013), but organizational cultures can vary in their value fit. Because egalitarianism is valued by both majority- and minority-group members (Graham et al., 2009; Katz & Hass, 1988), perceived norms for inclusion might be an important predictor of value fit for anyone. However, given that a lack of value fit has been implicated in women's underrepresentation in STEM (Cheryan et al., 2009; Diekmann et al., 2017), the perception of an inclusive workplace culture might be an especially strong signal of value fit for women.

In addition to whether changing norms for inclusion predict a sense of value fit for women and men in STEM, we also considered how these norms might predict women's changing sense of self-efficacy and social identity threat. Self-efficacy (Tellhed et al., 2017) and social identity threat (Hall et al., 2015, 2018; Steele et al., 2002) have both been implicated in women's low representation in STEM fields. Feeling that others have a negative view of gender-inclusive policies might lead women to question their abilities, or it may elicit a concern that others evaluate them through the lens of a devalued social identity. Previous research has found that women working in engineering companies who hold a strong engineering = male cognitive association feel both lower self-efficacy and lower commitment to their organization (Block et al., 2018). Furthermore, not only does the experience of social identity threat predict lower performance and burnout (Hall et al., 2015, 2018; Logel et al., 2009), it is also higher for women who report working in STEM organizations with fewer gender-inclusive policies in place, in part because they experience less positive interactions with male colleagues (Hall et al., 2018). Thus, when perceived normative support for gender inclusion changes over time, this cultural signal of women's inclusion in the workplace might also predict changes in women's self-efficacy and social identity threat.

Hypotheses

In the present work, we examined whether an increase in perceived support for gender-inclusive policies and practices would predict an increase in organizational commitment for women working in STEM. We hypothesized that women who perceive that others (typically men) in their organization have increased their support for gender-inclusive policies and practices over time will experience increased organizational commitment. We explored increases in value fit, self-efficacy, and social identity threat as potential mediating mechanisms for this relationship.

We also assessed two primary alternative explanations for women's changes in commitment and value fit. First, perhaps it is not the perception of improving norms around gender inclusion that relates to increased value fit and organizational commitment, but instead a more general change in people's attitudes toward the company that produces positive ratings on all outcomes. If changes in value fit and commitment are better explained by a more general change in how people evaluate the organization, we would expect that changing evaluations of any organizational policy (including those unrelated to gender inclusion) would similarly relate to changes in perceived value fit and organizational commitment. To rule out this potential third-variable explanation, we hypothesized that the predicted effects would be unique to changing norms about gender inclusion policies and would not be found for perceived norms related to health and safety policies.

A second alternative explanation is that it is not the perception of changing norms around gender inclusion that predicts women's changes in value fit and organizational commitment, but rather the degree to which they have materially benefitted from the policies and practices themselves. Participants' organizational outcomes (i.e., fit and commitment) may change over time as a function of personally benefitting from inclusive policies. These personal benefits could also be a third-variable explanation for why we might observe a relationship between changing norms

and women's workplace outcomes. To rule out this possibility, we will assess the robustness of our focal effects to controlling for both the awareness of gender-inclusive policies and personally benefitting from these policies.

We tested these hypotheses as part of a longitudinal field study collected as a 6-month follow-up to an initial cross-sectional sample (Hall et al., 2018); see the supplemental material for information about this data set). Although our primary hypotheses focused on women, in exploratory analyses, we examined the same relationships among men, who might exhibit different patterns. Because inclusive practices can be met with anger, fear, and resentment when they are seen as externally imposed and discrepant from one's own beliefs (Craig et al., 2017; Crandall et al., 2002; Dunton & Fazio, 1997; Plant & Devine, 1998), one possibility is that a perception of growing support for gender inclusion efforts could predict reduced fit and organizational commitment among men. However, a perceived increase in support for gender inclusion (especially one that does not signal a zero-sum competition for resources; Earle & Hodson, 2020; Norton & Sommers, 2011) might align with strong values of equality and fairness (Graham et al., 2009; Rokeach, 1973; Wilton et al., 2019). Thus, an alternative prediction is that a perceived increase in support for gender inclusion could predict increased value fit for men and women. Because value fit predicts group commitment (Crandall et al., 2002; Festinger et al., 1950; Sherif & Sherif, 1953), men might also feel more committed to organizations when norms become more supportive of inclusion. A third possibility is that a perceived increase in support for inclusive policies might have little effect on men, who have less reason to be vigilant to gender-based cues.

To test these alternative predictions for men's responses, we tested gender as a possible moderating variable for our hypothesized relationships. If an increase in support for inclusion has similar benefits for women and men, we should find a main effect of changing norms that does not interact with gender in predicting organizational

commitment and fit, as well as an indirect effect of fit on commitment that is not moderated by gender. If, however, these changing norms elicit either reactance or have no effect for men, we would instead expect to find significant moderation by gender. If norms for inclusion trigger reactance, we might even observe a decrease in men's value fit and commitment, and an increase in social identity threat as norms toward gender inclusion increase.

Methods

Participants and Procedure

Sample. A sample of 181 engineers (96 women, 85 men; $M_{\text{age}} = 35.19$) was collected as part of a 6-month follow-up survey sent to people who took part in an earlier, broader study of experiences in engineering (see the supplemental material more information). The sample size was constrained by two factors: (a) the number of people who took part in the original study (which itself draws from a scarce supply, given that only approximately 20% of engineers are women) and (b) the degree of attrition of the 6-month follow-up survey. Of the 268 participants in the original study, 68% ($N = 181$) completed the follow-up. There was no evidence of differential attrition by gender, $b = -0.25$, $\chi^2 = -0.94$, $p = .350$, or that participants who completed the 6-month survey were significantly different from those that dropped out of the study on any key study variable (see Table S1 in the supplemental material). Participants in the final sample worked in 25 different engineering companies, and men and women were equivalent in terms of age, level of education, marital status, number of children, personal income, gross income, number of career positions, and status of their current position (see supplemental material for more information about company-level variability).

Procedure. Participants completed several surveys across the course of a 6-month period (see supplemental material for a list of all measures). We reasoned that 6 months would be a long

enough period of time to observe change, while minimizing the possibility of attrition. Measures of normative attitudes about gender-inclusive policies and practices were assessed in the initial survey (Time 1a) and in the final 6-month follow-up survey (Time 2). Approximately 2–4 weeks following the initial survey (and after an unrelated 10-day daily diary protocol reported in Hall et al., 2019), participants completed measures of organizational commitment and person–organization fit (Time 1b). These variables were also assessed in the 6-month follow-up (Time 2). Participants received a \$10.00 gift card for their participation.

Measures

Unless otherwise stated, participants responded to self-report items using a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). See Table S3 for descriptive statistics on key variables.

Gender-inclusive policies and practices (GIPP). The Time 1a survey included measures of participants' awareness of, perceived normative support for, and personal benefits from GIPP at their company. To assess awareness of GIPP, participants first completed a 20-item checklist that was divided across five subsections, four of which were gender-inclusive categories: flexible work programs; work–life balance programs; gender-equal recruitment retention, and advancement in engineering; and promoting a gender-inclusive culture. The fifth subsection, health and safety policies (a four-item checklist), was included as a control set of policies (see Hall et al., 2018). The number of “Yes” responses across the 16 gender-relevant items were summed to create a count of gender-inclusive policies and practices for each participant that could range from 3 to 15 (see supplemental material for more details). As cited in Hall et al., 2018, participants' awareness ratings were significantly correlated with human resources reports ($r = .56$, $p = .007$), suggesting that participants' awareness of policy ratings had some objective validity.

To assess perceived norms for GIPP, participants rated their perceptions of how others in their organization felt towards each set of policies and practices (e.g., “How do people in your organization view policies or programs that promote the recruitment, retention, and advancement of women in your organization?”). These five ratings were made on a 7-point scale (1 = *very negatively*, 7 = *very positively*), and the average rating for the four gender-inclusive categories constituted perceived norms for GIPP ($\alpha_{\text{Time 1}} = .80$, $\alpha_{\text{Time 2}} = .83$).

Finally, to assess personal benefits of GIPP, participants rated how much they had personally benefitted from policies and practices in each of the five categories (e.g., “Have you directly benefitted from any policies or programs that your organization might have to promote the recruitment, retention, and advancement of women in your organization?”). Ratings of benefits were made on a 5-point scale (1 = *no, I have not benefitted from these policies*, 5 = *yes, policies like these have benefitted me a great deal*), and responses to the four gender-inclusive categories were averaged to constitute personal benefits ($\alpha_{\text{Time 1}} = .50$,¹ $\alpha_{\text{Time 2}} = .73$).

At Time 2 (i.e., 6 months later), participants were asked to reflect upon the last 6 months and make the same ratings of perceived normative attitudes toward and personal benefits from the policy categories rated at Time 1. We did not include the 20-item policy checklist at Time 2, as it seemed unlikely that the policies and practices themselves would have markedly changed after 6 months.

Value fit. The perceived fit of personal values to the organization was assessed both at Time 1b and Time 2 with three items (e.g., “My personal values match my organization’s values and culture”; $\alpha_{\text{Time 1}} = .94$, $\alpha_{\text{Time 2}} = .94$; Cable & DeRue, 2002).

Social identity threat. Social identity threat was measured at Time 1 and Time 2 with four items (e.g., “How often do you worry that people at

work will judge you because of what they think of your gender?”; $\alpha_{\text{Time 1}} = .87$, $\alpha_{\text{Time 2}} = .88$).

Self-efficacy. Self-efficacy was assessed at Time 1b and Time 2 with six items (e.g., “I feel prepared for most of the demands in my job”; $\alpha_{\text{Time 1}} = .84$, $\alpha_{\text{Time 2}} = .87$).

Organizational commitment. Organizational commitment was assessed at Time 1b and Time 2 with six items (“I am quite proud to be able to tell people who it is I work for,” “I am thinking about leaving my current job,” “I feel myself to be part of the organization,” “I don’t plan to be in this organization much longer [reverse-coded],” “I would not recommend a close friend to join our staff,” “I plan to apply for jobs elsewhere in the next 2 years”; $\alpha_{\text{Time 1}} = .86$, $\alpha_{\text{Time 2}} = .87$; Cook & Wall, 1980).

Demographic variables. Demographic variables were assessed at Time 1a and in an initial recruitment survey (see supplemental material).

Results

Analytic Strategy

Using linear regression, we tested the degree to which changes in the perceived normative attitudes surrounding gender-inclusive policies and practices would predict changes in women’s (and perhaps men’s) value fit and commitment. Because our primary interest was in perceived change over time, we first residualized our focal variables by regressing scores at the 6-month follow-up from earlier assessments of the same variables and saving the residuals.²

Descriptive Information of Focal Measures

We first examined gender differences in key demographics and organizational variables³ with a series of independent samples *t* tests (summarized in Tables S2 and S3). As shown in Table S2, men and women were matched on demographic variables assessed at Time 1. But even though women were similar to men in age, status, and

Table 1. Means and standard deviations for the amount of change on focal predictor and outcome variables, both by gender and overall change for the sample.

Variable	Women	Men	<i>t</i> test for gender effect	M_{change} (<i>SD</i>)	Test against zero
Δ Benefit from GIPP	-0.10 (1.02)	-0.31 (0.97)	$t(177) = -1.38, p = .169$	-0.20 (1.00)	$t(178) = -2.69, p = .008$
Δ Norms of GIPP	-0.45 (1.18)	-0.54 (1.08)	$t(178) = -0.52, p = .601$	-0.49 (1.13)	$t(179) = -5.85, p < .001$
Δ Benefit from HSPP	-0.44 (1.46)	-0.36 (1.18)	$t(172) = 0.43, p = .666$	-0.40 (1.33)	$t(173) = -3.99, p < .001$
Δ Norms of HSPP	-0.33 (1.57)	-0.35 (1.48)	$t(177) = -0.08, p = .934$	-0.34 (1.52)	$t(178) = -2.95, p = .004$
Δ Commitment	-0.13 (0.98)	-0.12 (0.68)	$t(179) = 0.11, p = .911$	-0.13 (0.85)	$t(180) = -1.98, p = .050$
Δ Value fit	0.27 (1.08)	0.18 (0.85)	$t(179) = -0.57, p = .569$	0.23 (0.97)	$t(180) = 3.15, p = .002$

Note. GIPP = gender-inclusive policies and practices; HSPP = health and safety policies and practices.

income, female engineers reported significantly lower organizational commitment than men at Time 1b (see Block et al., 2018), a difference that remained at Time 2. Men also perceived more support for GIPP at Time 1. Men and women were equivalent on all other variables of interest: awareness of health and safety policies and practices (HSPP), perceived norms for HSPP, personal benefit from HSPP, awareness of GIPP, personal benefits from GIPP, and value fit.

An examination of the residualized change variables in Table 1 revealed that, regardless of gender, participants tended to report declines in perceived benefits from GIPP, perceived norms for GIPP, perceived benefits from HSPP, perceived norms for HSPP, and organizational commitment. Organizational value fit increased over the 6-month period. More importantly, we saw variability in the amount of change on our predictor variables, covariates, and dependent variables. Of particular note, there was considerable variability in people's perceived normative attitudes toward gender-inclusive policies and practices ($SD = 1.13$), paving the way for analyses assessing how these changing perceptions of norms predict women's (and men's) feelings of fit and commitment to their organization.

Change in support for GIPP and its relationship to organizational commitment. In a series of analyses, we regressed the residualized organizational commitment on the residualized norm variable, along

with participant gender and the Gender x Norm interaction. This set of analyses revealed that a perceived increase in normative attitudes toward gender-inclusive policies and practices predicted an increase in organizational commitment over the 6-month timeframe, $\beta = .23$, 95% CI [0.09, 0.37], $t(178) = 3.15, p = .002$. This relationship was not significantly moderated by gender, $\beta = -.24$, 95% CI [-0.53, 0.06], $t(176) = -1.59, p = .114$. However, focused analyses suggest that the effect was only significant for women, $\beta = .32$, 95% CI [0.14, 0.51], $t(176) = 3.41, p < .001$, and not for men, $\beta = .09$, 95% CI [-0.14, 0.31], $t(176) = 0.74, p = .458$ (see Table S4 and S5 for analyses broken down by policy type).

Change in support for GIPP and its relationship to value fit, self-efficacy, and social identity threat. In a parallel set of analyses, we regressed the residualized variables (value fit, self-efficacy, and social identity threat) on the residualized norm variable, along with participant gender and the Gender x Norm interaction. This set of analyses revealed that a perceived increase in normative attitudes toward gender-inclusive policies and practices predicted an increase in value fit, $\beta = .39$, 95% CI [0.26, 0.53], $t(178) = 5.67, p < .001$. There was no evidence that this relationship was moderated by participant gender, $\beta = -.09$, 95% CI [-0.37, 0.19], $t(176) = -0.64, p = .524$. The simple effects were significant for both women, $\beta = .43$, 95% CI [0.25, 0.61], $t(176) = 4.77, p < .001$,

Table 2. Results of linear regression testing the relationship between change in support for GIPP and change in organizational value fit and commitment, with covariates included .

	Effect of covariate	Focal effect of Δ norms for GIPP
Predicting organizational commitment		
Awareness of GIPP	$\beta = .11, t(177) = 1.45, p = .149$	$\beta = .22, t(177) = 2.93, p = .004$
Awareness of HSPP	$\beta = .04, t(177) = 0.52, p = .605$	$\beta = .23, t(177) = 3.13, p = .002$
Δ Benefits from GIPP	$\beta = .14, t(175) = 1.85, p = .066$	$\beta = .21, t(175) = 2.61, p = .010$
Δ Benefits from HSPP	$\beta = 0.00, t(170) = 0.05, p = .959$	$\beta = .25, t(170) = 3.15, p = .002$
Δ Norms toward HSPP	$\beta = .07, t(176) = 1.02, p = .310$	$\beta = .19, t(176) = 2.24, p = .026$
Gender (male = -1, female = 1)	$\beta = -.05, t(177) = -0.71, p = .476$	$\beta = .23, t(177) = 3.09, p = .002$
Predicting value fit		
Awareness of GIPP	$\beta = .15, t(177) = 2.15, p = .033$	$\beta = .37, t(177) = 5.38, p < .001$
Awareness of HSPP	$\beta = .16, t(177) = 2.30, p = .023$	$\beta = .39, t(177) = 5.68, p < .001$
Δ Benefits from GIPP	$\beta = .17, t(175) = 2.30, p = .023$	$\beta = .31, t(175) = 4.14, p < .001$
Δ Benefits from HSPP	$\beta = .17, t(170) = 2.44, p = .016$	$\beta = .32, t(170) = 4.47, p < .001$
Δ Norms toward HSPP	$\beta = .23, t(176) = 3.75, p < .001$	$\beta = .25, t(176) = 3.17, p = .002$
Gender (male = -1, female = 1)	$\beta = .02, t(177) = 0.33, p = .745$	$\beta = .39, t(177) = 5.66, p < .001$

Note. Covariates were tested in separate models one at a time to preserve power, and the significance of the focal effect was examined. The reported focal effect of Δ norms for GIPP is collapsed across genders. GIPP = gender-inclusive policies and practices; HSPP = health and safety policies and practices.

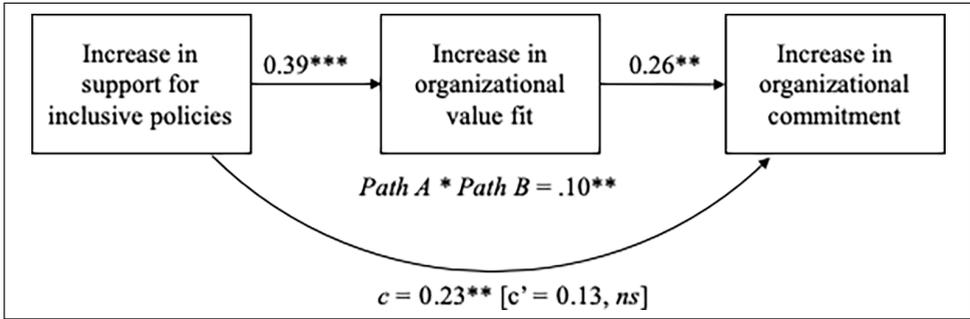
and men, $\beta = .34$, 95% CI [0.12, 0.56], $t(176) = 3.09$, $p = .002$, suggesting that both view inclusive policies and practices as more in line with their personal values (see Tables S4 and S5 for analyses broken down by policy type). Perceived changes in support for gender-inclusive policies were not, however, related to changes in self-efficacy, $\beta = .09$, 95% CI [-0.15, 0.14], $t(178) = -0.04$, $p = .965$, or changes in social identity threat, $\beta = -.12$, 95% CI [-0.27, 0.02], $t(178) = -1.65$, $p = .100$, and there was no evidence of moderation by gender for either of these variables ($ps > .15$).

Testing alternative explanations. Given the correlational nature of these data, it is possible that the described relationships are best explained by a more general change in attitude toward the company that produces positive or negative ratings on all of these variables. It is also possible that participants' attitude ratings (especially for women) changed due to changes in the extent they personally benefitted from these policies in the interim period between the two surveys. To test whether

key effects could be spuriously explained by these other factors, we repeated analyses on organizational commitment and value fit controlling for other policy-related variables. For both outcome variables, the relationship between changing norms and organizational commitment and value fit remained significant in separate analyses controlling for participants' awareness of GIPP and health and safety policies at their company, residualized change in personally benefitting from GIPP and health and safety policies, and residualized change in attitudes towards health and safety policies (see Table 2 and Table S3 for descriptive statistics).⁴ These analyses point to the specificity of the predictive effects of changing norms for gender-inclusive policies on predicting changes in organizational commitment (among women) and value fit (among everyone).

Value fit and its mediating role in the relationship between change in support for GIPP and organizational commitment. In a final set of analyses, we tested whether increases in value fit mediated the relationship between a change in normative attitudes toward

Figure 1. Results of a mediation model testing the effect of an increase in support for gender-inclusive policies on (men’s and women’s) increases in organizational commitment, as mediated through increased value fit.



Note. ** $p < .01$. *** $p < .001$.

gender-inclusive policies and practices and increased organizational commitment. A mediation model (see Figure 1) was tested using the lavaan R package (Rosseel, 2012). The path model revealed a significant indirect effect, $Path A * Path B = 0.10$, 95% CI [0.03, 0.17], $Z = 2.90$, $p = .002$. A perceived increase in support for gender-inclusive policies and practices was related to increased value fit (Path A = 0.39, $Z = 5.70$, $p < .001$), and increased value fit was associated with an increase in organizational commitment (Path B = 0.26, $Z = 3.37$, $p = .001$). Notably, the indirect effect was significant both among women ($ab = 0.11$, $Z = 2.75$, $p = .006$; Path A: $\beta = .43$, $Z = 4.83$, $p < .001$; Path B: $\beta = .25$, $Z = 3.41$, $p = .001$) and men ($ab = 0.09$, $Z = 2.28$, $p = .022$; Path A: $\beta = .34$, $Z = 3.13$, $p = .002$; Path B: $\beta = .25$, $Z = 3.41$, $p = .001$). These effects were robust to individually controlling for the presence of gender-inclusive policies and practices, the presence of health and safety policies, a perceived increase in personally benefitting from gender-inclusive policies and practices, a perceived increase in personally benefitting from health and safety policies, and a perceived increase in support for health and safety policies.⁵

Discussion

This study provides novel evidence that changes in organizational culture predict positive

outcomes for women in STEM. We find that, for women, changes in commitment to their organization are in part related to perceptions of dynamic norms about gender-inclusive organizational policies and practices. Previous work has documented the negative climate in STEM workplaces (e.g., Baird, 2018; Cardador, 2017; Hall et al., 2015, 2018; Ruder et al., 2018; van Oosten et al., 2017). The present research provides evidence of the link between organizational culture and commitment among women in STEM. Building from past work showing that organizational investment in employees (e.g., economic and developmental rewards) facilitates employee commitment (Cai et al., 2018), and from other research suggesting that dispositional variables like women’s own internalization of implicit stereotypes predict their lower commitment (Block et al., 2018), our work points to the importance of beliefs about others’ perceptions of organizational practices in predicting organizational commitment, a key predictor of employee turnover (Cohen & Hudecek, 1993; Somers, 1995; Tett & Meyer, 1993).

The present work found that perceived increases in support for gender-inclusive policies and practices predicted increases in fit between organizational and personal values. Perceived fit between personal and organizational values is an important predictor of employee success (Hoffman & Woehr, 2006; Kristoff-Brown et al.,

2005; Rayton et al., 2019; Silverthorne, 2004). Our work points to norms of inclusion as an important part of creating fit between personal and organizational values. For women, experiencing fit between personal and professional values predicts their interest in STEM fields (Diekman et al., 2017; Cheryan et al., 2009). Thus, encouraging support for gender-inclusive policies and practices might help create organizations that facilitate commitment for women and men.

Importantly, we were able to rule out several third-variable explanations for the reported results on organizational commitment. Perceptions of normative attitudes toward gender-inclusive policies were more predictive of women's organizational commitment than simply an awareness that the policies were in place or having personally benefitted from the policies. This supports the central importance of perceived changes in the prevailing normative attitudes for employees' commitment. We also found evidence that the relationship between dynamic norms of inclusion and commitment was not accounted for by employees' more general change in attitudes toward the company. It was not the case that evaluation of any organizational policies (i.e., reflecting a simple change in positive evaluation of the organization that is not specific to gender-inclusive norms) explained changes in women's thoughts about staying at or leaving their organization. Taken together, these analyses suggest that organizations might need to do more than simply enact inclusive policies, they might also need to ensure that there is broad support among employees for those policies.

Changes in support for inclusive policies and practices were positively related to changes in men's and women's sense of value fit to their organization. However, this finding was not as robust to covariate analyses as organizational commitment. Past work has shown that inclusive policies and practices can be met with resentment and anger from majority-group members (e.g., Morrison et al., 2010). We did not find evidence of such backlash. This discrepancy in findings might reflect the different impact of norms activated in a

lab versus a field setting, or could imply that we have a self-selected sample of particularly egalitarian-minded engineers. It is also likely that we would have found greater evidence of backlash if our measure of gender-inclusive policies and practices would have more explicitly emphasized programs designed to exclusively benefit women, allowing men to assume possible zero-sum costs for them (Kuchynka et al., 2018). Regardless of why we found this inconsistency, we believe it points to the need for more fieldwork that looks to understand the impact of inclusive policies and practices (Ditlmann & Paluck, 2015).

Our work suggests that, alongside putting gender-inclusive policies and practices in place, companies might also benefit from creating a culture where employees express support for these policies and practices. This might be most successful if first done by people in senior leadership positions (Chudek et al., 2012). Change in norms can happen in either direction: norms can improve or worsen. In fact, in the present data set there was an overall trend toward decreases in perceived support for GIPP over time. Leaders in organizations have the power to signal positive norms but can also undermine support for gender inclusion. Future work should look to pinpoint the most effective ways to signal support. Signaling support for these policies would not only allow women to benefit from them but should also lead employees to report higher levels of fit between personal and organizational values, and this may translate into increased organizational commitment. Taken together, these findings offer a low-cost intervention that could help retain more women, and men, in STEM companies.

Limitations and Future Direction

Future research using experimental designs is needed to establish directionality and rule out other third-variable explanations. The present findings could be complemented by lab studies that manipulate norms (Blanchard et al., 1991) to test how men's and women's persistence is affected by cues suggesting they are working in an

inclusive (vs. noninclusive) space. In addition, it is unclear how the results of this work will generalize to other fields and other marginalized groups. In fields with more gender-equal representation, women might be less attuned to the perceptions of others regarding inclusive policies and practices because their fit and belonging feel less precarious (Cohen & Garcia, 2008; Schmader & Sedikides, 2018). Research on race suggests that White people often overestimate racial progress. Racial minorities may not benefit from perceiving majority-group members as supportive of inclusion when there is also a lack of understanding of the degree to which inequality needs to be addressed. These questions could be addressed in future work.

Conclusions

This study reveals that a perceived increase in support for gender-inclusive policies and practices is an important predictor of increased organizational commitment. Given that organizational commitment is strongly related to turnover (Fouad et al., 2017), the present work points to a possible mechanism for women's higher rates of turnover in male-dominated fields. However, it also offers a point of intervention. This research suggests that people might be able to support women's retention in STEM fields by signaling their own positive attitudes towards inclusive policies and practices. We hope these findings offer an optimistic message about the value not just of creating inclusive spaces, but also of garnering broad support for them.

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Supplemental material

Supplemental material for this article is available online.

Notes

1. This measure aggregates benefits across independent categories with no expectation that benefiting from one category would necessarily mean that you have benefitted from another. Thus, it is reasonable to create a composite reflecting the average degree of perceived benefit across different policy types even though the alpha is low. This composite will give us an overall measure of perceived benefits, with the expectation that the items going into this composite are not necessarily correlated. Similar approaches are often taken when working with measures assessing the perceived frequency of health problems. The individual items might not correlate with one another (e.g., headaches vs. joint pain), but the composite across the items still provides a window into a person's experience of their health.
2. Note that cross-lagged analyses would not be theoretically sensible, as we did not expect that norms measured at Time 1 would predict outcomes assessed 6 months later.
3. The correlations between key organizational variables can be found in Table S6.
4. In models in which all significant covariates (Δ benefit from GIPP, Δ norms of HSPP) were entered simultaneously, change in perceived support for GIPP is still significantly predictive of women's changes in organizational commitment ($p = .038$) and marginally predictive of women's changes in organizational value fit ($p = .064$). Change in personally benefiting from gender-inclusive policies significantly predicts change in

women's value fit and organizational commitment; change in perceived norms about health and safety policies also uniquely predicted change in women's value fit.

5. In a mediation model in which all significant covariates (Δ benefit from GIPP, Δ norms of HSPP) were entered simultaneously, Path B remained significant ($b = 0.25, Z = 3.23, p = .001$), but Path A became marginal ($b = 0.18, Z = 1.90, p = .058$), resulting in the indirect effect being nonsignificant ($ab = 0.05, Z = 1.64, p = .102$).

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