An evidence-based faculty recruitment workshop influences departmental hiring practice perceptions among university faculty

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Abstract

Purpose – Many university programs seek to promote faculty diversity by reducing biases in hiring processes. The purpose of this paper is to conduct two studies to test the individual- and department-level impact of a faculty recruitment workshop (FRW) on faculty attitudes toward evidence-based, equitable hiring practices.

Design/methodology/approach – Study 1 included 1,188 faculty who had or had not attended an FRW. Respondents were surveyed about their attitudes and their intentions to use specific equitable search practices. The authors assessed the proportion of faculty in each department to test for the impact of department-level workshop attendance on individual faculty attitudes. Study 2 employed a similar design (with 468 faculty) and tested whether effects of workshop attendance are explained by changes in beliefs about social science research.

Findings – Faculty had more favorable attitudes toward equitable search strategies if they had attended a workshop or if they were in a department where more of their colleagues had. Workshop attendance also increased intentions to act on two of three recommendations measured, and led to greater belief in evidence-based descriptions of gender biases. Some evidence suggested that these beliefs mediated the influence of the FRW on attitudes.

Research limitations/implications – Because faculty were not randomly assigned to attend the workshop, no strong claims about causality are made.

Practical implications – The present studies demonstrate that an evidence-based recruitment workshop can lead faculty to adopt more favorable attitudes toward strategies that promote gender diversity in hiring.

Originality/value – These studies provide evidence of the role of belief in social science research evidence in explaining the effectiveness of a program designed to increase faculty diversity.

Keywords Organizational culture, Women, Recruitment, Psychology

Paper type Research paper

Diversity in group settings has been found to be related to improved performance and decision-making, innovation and creativity (Ely and Thomas, 2011; Page, 2007, 2017), suggesting that in the university context, greater faculty diversity can enhance institutional excellence in teaching and scholarship and benefit an increasingly heterogeneous student body (Stewart and Valian, 2018). Therefore, many colleges and universities have developed initiatives, including training workshops for faculty search committees, to increase the representation of women and underrepresented racial-ethnic minority (URM) faculty.

Although hiring trends are typically tracked and training workshops evaluated by attendees, there is less understanding of the psychological factors that lead to the attitude and behavior change among attendees that could ultimately increase faculty diversity. Greater understanding of these factors would help inform the development of effective faculty diversity initiatives. In this paper, we examine the role of education about social science findings and principles in shaping specific attitudes and behavioral intentions among faculty search committee members, which highlights the importance of basing faculty search training workshops on compelling scientific evidence.

Initiatives to increase faculty diversity and their evaluation

Many higher education institutions have focused on increasing faculty diversity, particularly in disciplines where there are substantially fewer women and/or faculty of color. The National Science Foundation's (NSF) ADVANCE Program is offered to "increase the representation and advancement of women in academic science and engineering careers, thereby contributing to the development of a more diverse scientific and engineering workforce" (ADVANCE at a Glance, 2018). In particular, the ADVANCE Institutional Transformation grant program supports initiatives designed to increase the representation of women faculty in STEM fields through efforts to escalate their hiring, promotion and retention. To date, more than $270m has been invested by the NSF to support ADVANCE projects at more than 100 institutions in 41 states, the District of Columbia and Puerto Rico (ADVANCE at a Glance, 2018).

At odds with the expanse of the ADVANCE program is evidence suggesting that programs to increase diversity may fail outright or fail to be sustained. Much of this research focuses on "diversity training" or bias reduction workshops in corporations and businesses. Several factors have been identified that lead such programs to fail. For example, the use of top-down efforts to control behavior that reduce feelings of autonomy in decision-makers can result in backlash against diversity initiatives (Dobbin and Kalev, 2016). In addition, singular reliance on seemingly objective bases for decision-making such as job qualification tests often fail, because they can be misused by managers unaware of their own biases such that they discount the performance of women and people of color (Rivera, 2012). Use of these strategies has resulted in negative gains in diversity (Dobbin and Kalev, 2016). Fortunately, this research has also revealed factors that lead to greater success; for example, increasing engagement of an organization's constituents in diversity matters can lead them to feel personally invested in these issues. Other positive factors include promoting intergroup contact, which improves perceptions of the competence of women and people of color, and increasing social accountability by using diversity task forces and diversity managers that ask questions about employment decisions. Use of these strategies has also been shown to increase diversity and reduce bias (Dobbin *et al.*, 2015; Kalev *et al.*, 2006).

Because faculty search training programs may not always follow these recommendations, evaluation of their effectiveness is critical. Therefore, ADVANCE initiatives and programs are evaluated not only to solicit suggestions for improvement, but also to test whether they are effective in achieving a more diverse faculty. The effectiveness of these programs can be assessed in several ways. Most obviously, one may evaluate changes in the numbers of white female and URM faculty hired as a result of the training. One study tested this following a three-step intervention on members of faculty search committees in STEM at a large public university in the USA. Faculty search committee members who were randomly assigned to the intervention group heard a short presentation of social science research on gender bias, received a "faculty search toolkit," and their job finalists were provided with a "family advocate" to discuss dual career issues and family friendly policies during their interview visit. Those assigned to the control group simply engaged in the university's standard human resources training for search committees.

The search committees in the intervention group were 6.3 times more likely to make an offer to a female candidate, and female candidates who were made offers were 5.8 times more likely to accept their offer (Smith *et al.*, 2015). This research suggests that evidence-based interventions that also provide information on family and partner issues can increase faculty diversity. Further research on how these programs impact faculty and departments may be invaluable for improving workshops and maintaining change.

Although outcomes such as hiring trends and program evaluations are tracked by ADVANCE-funded programs, there is less known about the psychological factors that are influenced by this programming, and the role they play in producing the change in attitudes and behaviors that may lead to increasing faculty diversity. Understanding how and why particular faculty search training programs work to increase faculty diversity would help identify the specific elements that are important to include in such programs. In the present research, we incorporated knowledge from social psychology to examine the role of attitudes, behavioral intentions and perceived norms regarding equitable faculty search processes among faculty search committee members at one university, and explored the psychological antecedents that shape them.

The importance of changing attitudes, intentions and norms
Because the prevailing attitudes and culture of the setting influence the success of institutional change efforts, institutional climate can play an important role in increasing diversity among its members. That is, well-conceived, evidence-based initiatives may be instituted but fail if the institution's constituents are not "on board" to accept and sustain them. Therefore, it is critical that such initiatives serve to promote attitudes and beliefs supporting the idea that institutions benefit from greater diversity. Bias reduction workshops are one way to influence how people think about diversity and inclusion. One study found that faculty who were randomly assigned to attend a "bias literacy" workshop reported higher sensitivity to and awareness of bias in their academic setting, and greater intentions to use bias reduction strategies taught in the workshop (Carnes *et al.*, 2012). An important next step is to evaluate whether interventions also affect some of the specific attitudes that would help to sustain more equitable hiring practices.

Attitudes about specific behaviors (e.g. attitudes about specific hiring practices and procedures) tend to be better predictors of those behaviors than attitudes about the general topic (Ajzen, 1991). Attitudes about the general idea of increasing faculty diversity are certainly important, but people may be unlikely to act on them if they do not approve of the specific strategies that would ultimately promote faculty diversity. Along these lines, assessing whether people endorse and intend to behave in line with equitable hiring practices after an intervention should also grant insights into the process by which such programs translate to hiring practices and into the specific equitable practices to which faculty may be more or less receptive.

In addition to understanding individual-level attitude change, examining attitudinal processes at the group level may also help to assess the impact of faculty search interventions. When many individuals in a setting such as a workplace hold particular attitudes, the nature of these attitudes can shape the behaviors typically enacted in that setting, thus establishing both attitudinal and behavioral norms (Cialdini *et al.*, 1990). Faculty members in departments where many other faculty members have attended a faculty search training workshop may thus perceive a norm of positive attitudes toward hiring practices promoted in the workshop within their departments. If holding positive attitudes regarding conducting equitable faculty searches is perceived as the norm, and spreads among members within departments in which larger proportions of members have attended a faculty search training workshop, this would provide evidence of the value of such efforts to enact institutional change regarding faculty diversity.

The importance of belief in social science research evidence

To achieve real change in diversity, institutions must want to change; therefore, it is critical to convince its members of the importance of the issue and motivate them to take action (Mitchneck *et al.*, 2016; Stewart and Valian, 2018). Such motivation may develop as faculty members engage in "change narratives" about "where we are, where we want to be, and how we will get there" (Ely and Meyerson, 2000). Perhaps particularly in academic settings, effective faculty search training workshops should provide attendees with compelling empirical evidence for the benefits of equitable search processes, i.e., those that take deliberate steps to reduce the influence of unintended bias.

To meet this goal, it is important that faculty search training workshops draw from the social science literature on topics relevant to bias and evaluation. Of fundamental importance is research demonstrating our reliance on schemas: the generalized beliefs we hold about the characteristics of people, objects and events (Fiske and Taylor, 2013). Our ingrained reliance on schemas asserting white men's prowess in science fields can lead to under-evaluation of members of other groups, as demonstrated in research on unintended or implicit bias. Faculty search training workshops can include studies showing, for example, that white and male job applicants are evaluated more favorably and are more likely to be recommended for job offers than racial minority and female applicants, despite having resumes that are identical except for the race and gender of the applicant (Bertrand and Mullainathan, 2004; Moss-Racusin *et al.*, 2012). Social science research on stereotyping and its effects on performance and motivation may be reviewed to raise awareness of the detrimental consequences of stereotype threat (Steele, 2010). Other related topics include accumulation of disadvantage (the idea that even small instances of bias accrue over time to significantly disadvantage members of negatively stereotyped groups in hiring, promotion and retention; Valian, 1998) and the general assertion that increasing diversity promotes excellence as opposed to diminishing the quality of our faculty (Page, 2007, 2017; Stewart and Valian, 2018).

Educating faculty search committees about this body of research and its relevance to the faculty hiring process can be an effective strategy for faculty recruitment training workshops (Carnes *et al.*, 2012). This study examines one such workshop and considers whether exposure to the content of the workshop influences attitudes and behavioral intentions among faculty participants.

The faculty recruitment workshop (FRW)

This research focuses on a workshop to promote gender diversity in STEM during the hiring process as part of one university's NSF ADVANCE Institutional Transformation grant. This FRW was developed in 2002 by a committee of eight faculty members who studied social science research relevant to the goal of hiring for diversity and excellence and created the content and format of the FRW. The committee expanded over time to include 13 faculty members from across the university, in both STEM and non-STEM fields, with a goal of achieving gender and racial diversity in the committee membership. The FRW was presented by the committee members, rather than by external "diversity consultants," following recommendations to include local leaders (one's fellow faculty members) as deliverers of the message (Anderson, 2011; Mitchneck *et al.*, 2016; Stewart and Valian, 2018, Wood, 2000).

A series of FRWs were offered to members of faculty search committees at the university during each fall semester beginning in 2003. The two-hour workshop was presented by a subset of the committee members (typically three), with the remaining committee members assisting in the audience. The content of the FRW (presented in a PowerPoint slideshow) included research findings on gender and race schemas, implicit bias, the accumulation of disadvantage and the value of diversity in promoting excellence, particularly in hiring and academic contexts. The FRW was designed to educate faculty about the social science research findings on these issues and to provide concrete guidelines for conducting more

equitable faculty searches (see Figure 1 for FRW slide examples, and the below given list for recommended recruiting strategies). The workshop included small group or table exercises (e.g. comparison of recommendation letters typical of those written for male vs female candidates) and a question and answer section. The FRW was revised every year to incorporate new research findings and address faculty feedback from post-workshop evaluations, although the basic content and message stayed the same. Faculty members serving on search committees in the largest units at the university (College of Literature, Science, and the Arts, and College of Engineering) were required to attend as a condition of serving on the search committee; attendance was encouraged in other units.

Equitable search strategies presented during the FRW:

- build an effective search committee that is vigilant about unconscious bias, stereotype threat, and the challenges of fair evaluations;

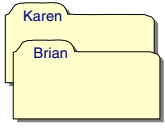- actively develop a diverse pool of applicants through networking and outreach;

Figure 1.
Example presentation slides with information about gender biases in hiring (left) and guidelines for more equitable search strategies (right)

- define the disciplinary area for your search as broadly as possible;

- ask for the information you need from applicants, using a template or checklist with clear instructions about the application process;

- make sustained and conscious efforts to counter potential evaluation bias, by defining specific evaluation criteria before the search, using candidate evaluation tools, avoiding early ranking and global evaluations that fail to consider all of the search criteria;

- provide a welcoming environment during the interview, avoiding "tokenism" and ensuring that candidates meet a diverse group of people;

- encourage circumstances that will allow you to see candidates at their best, by providing complete information about the visit well in advance and eliminating environmental cues that could trigger stereotype threat or a feeling of not belonging;

- ensure that all candidates know about dual career support and family friendly policies;

- consider only job relevant criteria in evaluating candidates: do not ask about their personal life including age, marital status, children, even in social situations such as dinner (such issues can be discussed after an offer is made); and

- recruit the selected candidate, providing detailed information to ensure the negotiation process is positive and effective for all candidates.

These strategies were developed based on recommendations based on previous research findings and best practices identified from university leaders with long-standing experience, as summarized by Stewart and Valian (2018).

Overview of current studies
The current studies test whether attending the FRW may influence individual attitudes and behavioral intentions regarding equitable search practices. We predicted that faculty who attended the FRW would show more favorable attitudes toward equitable search strategies and report greater intentions to enact them. The studies also tested whether the workshop can change department climates in ways that may ultimately impact the attitudes of individual faculty. We predicted that faculty will have more favorable attitudes toward equitable search strategies if they are in departments where a greater proportion of faculty have attended the FRW, perhaps even for individual faculty who have not attended an FRW themselves. Finally, we explored whether the FRW was more effective for persuading faculty to adopt some search strategies more than others. In Study 2, we examined attitudes regarding the social science principles underlying the FRW. In doing so, we hoped to highlight specific ways these workshops may encourage intentional efforts to promote faculty diversity.

Study 1
Method
Participants. Survey data for Study 1 were collected in 2012, 2013 and 2014. In each year of the data collection, faculty members who attended the FRW ($n = 201$) were surveyed at two time points: pre- and post-FRW in the year they attended the FRW. In addition, in each year we recruited samples of faculty who had attended an FRW within the previous three years (between 2009 and 2013), and faculty who had not attended a workshop within the previous three years (according to ADVANCE records) to complete the survey. The research team recruited these additional samples to reflect proportionally the colleges/schools represented in the pre-/post samples; that is, colleges/schools that were well represented at the

2012–2014 workshops (due, in some cases, to required attendance by college leadership) were comparably represented in the final FRW- attendee in previous three years ($n = 407$) and no-FRW groups ($n = 781$).

Because gender is known to impact receptivity to diversity messages (Holladay *et al.*, 2003), faculty gender was assessed as a moderator. Race/ethnicity was measured, but there were too few non-white faculty members to test for moderation. Similarly, analyses by faculty rank (assistant, associate and full professor) were not possible due to small sample sizes in the earlier ranks.

Overall, 61 percent of faculty respondents were men and 39 percent were women; nearly one-quarter (23 percent) were faculty of color (12 percent were Asian/Asian American and 11 percent were URM). Half of all respondents were full professors (53 percent), and the remaining respondents were associate (23 percent) or assistant (22 percent) professors.

Measures. Personal endorsement of equitable search strategies. Respondents used a scale of 1 (not at all important) to 5 (very important) to rate how important they personally believe it is for search committees to use 13 different guidelines highlighted in the FRW (e.g. "Use specific criteria (such as a candidate evaluation tool) in review of candidates"; $\alpha = 0.71$). These strategies were developed based on the recommendations of previous research findings and best practices identified from university leaders with long-standing experience (summarized by Stewart and Valian, 2018). See Appendix for items.

The items were developed to reflect the content of the workshop so that together, they reflect general endorsement of the recommended strategies. However, to explore differential effects of the FRW on specific strategies, we conducted an exploratory factor analysis (EFA). This suggested a three-factor solution: conducting equitable search and review strategies that address identity, disparities and bias (six items; $\alpha = 0.77$), providing family policy information for all candidates (two items; $\alpha = 0.92$), avoiding personal inquiries into a candidate's family (two items; $\alpha = 0.83$); the remaining three items acted independently. Single items were only retained as their own indices if they independently represented key content areas emphasized in the workshop. For this reason, one item about open searches was retained in addition to the three factors because it represented strategies to avoid limiting the applicant pool (see Table I for details).

Behavioral intentions. Respondents (in years 2013 and 2014 only) were asked to rate how likely they would be to respond in a specific way to four job search scenarios regarding the intention to object to: speculations on a candidate's motivation to accept an offer and to move to the university's geographical location; discussion of a candidate's partner or spouse; and accepting non-diverse shortlists (see Appendix for items). Ratings were on a scale of 1 (not at all likely) to 5 (very likely). The two items about speculating on a candidate's motives accept an offer and to move to the university's geographical location were significantly correlated, $r(398) = 0.87$, $p < 0.001$, and because they both concerned speculation about a candidate's motivation to take the job if offered, they were averaged into one composite score. The questions about intentions to object to discussions of a candidate's partner and to object to a non-diverse shortlist were reworded from 2013 to 2014 in order to reduce demand characteristics[1]. For this reason, analyses of those items included collection year as a factor.

Departmental FRW attendance. The percentage of faculty in each department that had attended an FRW was calculated using attendance records from the ADVANCE program and departmental information from the university's human resources office.

Results
Data were analyzed with three analytic approaches. The first was a comparison of those who attended an FRW within the past three years of participating in the study (2009–2013)

	Factor 1	Factor 2	Factor 3
1. Be mindful of the composition of the search committee in terms of gender and race/ethnicity	*0.63*	0.04	0.01
2. Decide and agree on specific applicant review criteria before the search begins	*0.63*	−0.15	−0.07
3. Use specific criteria (such as a candidate evaluation tool) in review of candidates	*0.59*	−0.07	0.01
4. Take steps to reduce the influence of unconscious bias during applicant review	*0.55*	0.09	0.08
5. Avoid interviewing only one candidate from a particular social group (e.g. gender or race)	*0.65*	−0.02	−0.07
6. During the visit, ensure that the candidate meets a wide variety of people from various social groups (e.g. gender or race)	*0.62*	0.09	−0.03
7. Ensure that every candidate receives family friendly policy information	−0.06	*0.92*	0.11
8. Ensure that every candidate receives dual career policy information	−0.10	*0.95*	0.14
9. During the visit, show we are a "family friendly" department by asking job candidates about their children and families (reverse scored)	−0.13	−0.03	*0.90*
10. Try to find out if the candidate has dual career issues by asking if he or she has a partner (reverse scored)	−0.07	−0.04	*0.81*
11. Avoid referring to a candidate in terms of his or her social group membership (e.g. as the woman or the minority candidate)	0.17	0.08	0.21
12. Focus the search on narrow content areas rather than using a broad or "open search" (reverse scored)	0.02	0.02	0.12
13. Engage in active recruiting of specific individuals prior to the official opening of the search	0.01	0.10	−0.08
Cronbach's α for each factor	$\alpha = 0.77$	$\alpha = 0.92$	$\alpha = 0.83$

Notes: Coefficients are standardized loadings from the pattern matrix. This EFA was conducted with principal axis factoring and an oblique (promax) rotation. The number of factors was determined through parallel analysis. Italic coefficients are those that load strongly onto one factor (at least 0.4) with no substantial cross-loadings

Table I.
Study 1 personal
endorsement of search
strategies items and
EFA results

and those who had not attended (individual FRW attendance: FRW vs no-FRW). Second, pre- and post-FRW attendance was compared for the subset of participants who attended from 2012 to 2014 (pre-FRW vs post-FRW). Finally, linear mixed-effects model tested the role of departmental participation in the FRW (departmental FRW attendance: proportion of a department's members who had ever attended an FRW). All analyses included gender as a factor. For the endorsement items, the primary analyses used an aggregate of all 13 items; and the linear mixed-effects models allowed us to test all hypotheses with both the aggregated and disaggregated (three factor) indices.

Regarding the ANOVAs reported below, an examination of the boxplots and a Levene's test suggested the data deviated somewhat from the assumption of equal variances ($F(3, 1,097) = 5.01$, $p = 0.002$). For this reason, we tested all ANOVAs across both studies with a Welch correction for heterogeneity of variance; results were virtually identical to conventional ANOVAs. We report the conventional ANOVAs below for ease of interpretation.

Personal endorsement of equitable search strategies
FRW vs No-FRW analysis. A 2 (faculty gender) × 2 (individual FRW attendance: FRW vs No-FRW) between-subjects ANOVA revealed that faculty members who attended an FRW within the previous three years reported stronger personal endorsement of equitable search strategies than those who had never attended an FRW ($F(1, 1097) = 11.43$, $p = 0.001$, $\eta_p^2 = 0.010$). Female faculty endorsed the strategies more than male faculty ($F(1, 1097) = 14.53$, $p = 0.001$, $\eta_p^2 = 0.013$). These main effects were not qualified by an interaction ($F < 1$, $p > 0.30$).

Pre-post FRW analysis. A 2 (faculty gender) × 2 (time: pre- vs post-FRW) mixed model ANOVA, with time as the within subject factor, mirrored these findings. Faculty endorsed equitable search strategies more after attending the workshop than before (main effect of time $F(1, 199) = 116.73$, $p = 0.001$, $\eta_p^2 = 0.37$). This analysis also revealed a main effect of gender ($F(1, 199) = 4.43$, $p = 0.05$, $\eta_p^2 = 0.019$), but no interaction ($F < 1$, $p > 0.40$). See Table II for descriptive statistics on personal endorsement of equitable search strategies.

Behavioral intentions
Intentions to object to speculation of candidates' motives
FRW vs No-FRW analysis. Results of a 2 (FRW vs No-FRW) × 2 (faculty gender) ANOVA revealed that faculty who attended an FRW reported marginally stronger intentions to object to speculation on candidates' motives than those who had never attended an FRW ($F(1, 394) = 3.02$, $p = 0.08$, $\eta_p^2 = 0.01$). Female faculty reported stronger intentions to object than male faculty ($F(1, 394) = 7.86$, $p = 0.005$, $\eta_p^2 = 0.02$). However, there was no interaction between FRW attendance and gender ($F(1, 394) = 1.07$, $p = 0.301$).

Pre-post FRW analysis. Results of a 2 (faculty gender) × 2 (collection year) × 2 (time) mixed model ANOVA with time as the within subjects factor showed the same pattern. Intentions to object to speculation on candidates' motives were significantly higher after attending the FRW than before ($F(1, 132) = 31.70$, $p = 0.001$, $\eta_p^2 = 0.19$). Intentions to object were somewhat higher among female than male faculty ($F(1, 132) = 3.99$, $p = 0.048$, $\eta_p^2 = 0.03$). No other significant effects emerged (all Fs < 1.19, ps > 0.27).

Intentions to object to discussions of candidate's partner
FRW vs No-FRW analysis. Results of a 2 (FRW vs No-FRW) × 2 (faculty gender) × 2 (collection year: 2013 or 2014) ANOVA revealed that faculty members who attended an FRW ($M = 4.29$, SE $= 0.14$) reported significantly stronger intentions to object to discussing a candidate's partner than those who had never attended an FRW ($F(1, 390) = 4.48$, $p = 0.04$, $\eta_p^2 = 0.01$). No other main effects or higher order interactions were significant, all Fs < 2.32, ps > 0.12.

| | Study 1 | | Study 2 | |
	No FRW attendance	Past FRW attendance	No FRW attendance	Past FRW attendance
n	781	407	333	135
General endorsement (all items)	*4.16* (0.51)	*4.26* (0.56)	*3.77* (0.42)	*3.99* (0.50)
Equitable search and review strategies	4.19 (0.71)	4.21 (0.74)	3.99 (0.62)	4.15 (0.62)
Providing family policy info	*4.51* (0.86)	*4.68* (0.71)	–	–
Avoiding personal questions about family[a]	*4.34* (1.06)	*4.54* (0.94)	*3.67* (1.33)	*4.00* (1.11)
Avoid limiting candidate pool[b]	*3.63* (1.21)	*3.88* (1.13)	*2.87* (1.03)	*3.34* (0.90)
Intentions to object to discussions of candidate's motives	3.22 (1.24)	3.49 (1.34)	–	–
Intentions to object to discussions of a candidate's partner	*3.95* (1.25)	*4.29* (1.19)	–	–
Intentions to call attention to a non-diverse shortlist	3.68 (1.27)	3.75 (1.35)	–	–
Belief in social science principles	–	–	4.03 (0.68)	4.15 (0.62)

Table II.
Means for endorsement, behavioral intentions and beliefs for Studies 1 and 2

Notes: [a]This strategy has two items in Study 1 that were collapsed into a single item for Study 2. [b]This strategy has one item in Study 1 and two in Study 2. Standard deviations are in parentheses. Italic shows means that are significantly different between the no FRW and past FRW groups

Pre-post FRW analysis. Results of a 2 (faculty gender) × 2 (collection year) × 2 (time) mixed model ANOVA with time as the within subjects factor showed that the only effect that approached significance was a collection year × time interaction ($F(1, 132) = 2.76$, $p < 0.10$, $\eta_p^2 = 0.021$). During collection year 2014, intentions to object to discussing a candidate's partner were stronger after attending the FRW compared to before ($F(1, 134) = 4.13$, $p = 0.044$), whereas these intentions were not significantly different in collection year 2013 ($F(1, 134) = 0.30$, $p = 0.59$), when wording of the item was changed to reduce demand characteristics. No other significant effects emerged, all Fs < 1.40, ps > 0.23.

Intentions to object to non-diverse shortlists
FRW vs No-FRW analysis. Results of a 2 (FRW vs No-FRW) × 2 (faculty gender) × 2 (collection year) ANOVA revealed a significant main effect of gender ($F(1, 387) = 8.16$, $p = 0.005$, $\eta_p^2 = 0.02$). Female faculty reported stronger intentions to object to non-diverse shortlists than male faculty did. A significant main effect of collection year emerged; faculty in 2013 ($M = 4.31$, $SE = 0.13$) reported stronger intentions to object than faculty in 2014 ($M = 4.31$, $SE = 0.12$; $F(1, 387) = 39.91$, $p = 0.001$, $\eta_p^2 = 0.09$), when wording of the item was changed to reduce demand characteristics. No significant main effect of past FRW attendance emerged, nor any higher order interactions, all Fs < 1.13, ps > 0.29.

Pre-post FRW analysis. Results of the mixed model ANOVA revealed only a significant main effect of collection year ($F(1, 131) = 41.93$ $p = 0.001$, $\eta_p^2 = 0.24$). Intentions to object were significantly higher in collection year 2013 ($M = 4.47$, $SE = 0.14$) than in 2014 ($M = 3.33$, $SE = 0.11$), when wording of the item was changed to reduce acquiescence. No other significant effects emerged (all Fs < 0.53, ps > 0.46). See Table II for descriptive statistics on behavioral intentions.

Mixed models testing department-level effects
We used a series of linear mixed-effects models to test whether the percentage of faculty in each department who had attended a workshop predicted personal endorsement of these same practices among each department's faculty respondents. All analyses were conducted in R using the lme4 package (Bates *et al.*, 2015) with the lmerTest package to extract p-values (Kuznetsova *et al.*, 2016).

The percentage of faculty in each department who had previously attended a workshop (departmental FRW attendance) ranged from 0.0 to 67.5 percent ($M = 33.4$ percent, $SD = 16.8$ percent). The total number of faculty within each department represented in the analyses ranged from 1 to 54 ($M = 19.2$, $SD = 12.2$).

We specified five models, each with individual department code included as a random intercept to address clustering (e.g. attitudes may be more similar within than between departments due to factors unrelated to workshop attendance). Model 1 had the percentage of faculty at the department level that had previously attended a workshop (departmental FRW attendance) as the independent variable; Model 2 had departmental FRW attendance, respondent gender ($0.5 =$ female, $-0.5 =$ male) and their interaction. Model 3 had departmental FRW attendance, individual workshop attendance ($0.5 =$ respondent has attended, $-0.5 =$ respondent has not attended) and their interaction term. Model 4 had all three aforementioned variables (departmental FRW attendance, respondent gender and individual workshop attendance), as well as all two- and three-way interactions. At last, Model 5 disaggregated the endorsement dependent variable into the specific strategy types identified in EFA and treated them as within subjects factors. For this model, we entered three centered dummy codes for the four strategy types (three factors and one retained single item) with the largest factor as the reference category. Testing the interaction between these codes and FRW attendance allowed us to assess differential effects of the FRW across strategy type.

Departmental attendance and general personal endorsement (aggregate index). The percentage of faculty within a department who had attended a workshop (departmental FRW attendance) was a significant, positive predictor of respondents' personal endorsement of equitable search strategies (see Table III). Gender and individual workshop attendance independently predicted personal endorsement, but the only somewhat significant interaction was between departmental attendance and gender. In sum, the effect of departmental FRW attendance influenced respondents' personal endorsement of equitable search strategies independent whether they had themselves attended an FRW, and this was slightly stronger for women.

Departmental attendance and endorsement of specific strategy types (disaggregated index). The significance of the interactions introduced in Model 5 suggested that in addition to a robust effect of FRW on endorsement of these strategies in general, the FRW was more effective for some strategies more than others (see Table III). We conducted additional analyses to extract simple effects for each strategy type in this model (see Table IV). These revealed that past FRW

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5
	Fixed effects				
Intercept	4.22****	4.23****	4.25****	4.26****	4.26****
Departmental attendance	0.32**	0.41***	0.19	0.30**	0.30**
Gender		0.10***		0.10**	0.10**
Individual attendance			0.14****	0.15****	0.15****
Dept. attendance × Gender		0.39*		0.51**	0.51**
Dept. attendance × Individual attendance			−0.22	−0.13	−0.13
Gender × Individual attendance				−0.04	−0.04
Dept. attendance × Gender × Individual attendance				0.42	0.42
Individual attendance × Strategy 1[a]					0.17**
Individual attendance × Strategy 2[a]					0.19**
Individual attendance × Strategy 3[a]					0.24**
	Random effects in SD				
Intercept for strategy type	0.37	0.37	0.37	0.37	0.26
Intercept for participant	0.31	0.31	0.31	0.30	0.30
Intercept for department	0.08	0.09	0.09	0.09	0.09
Residual	0.89	0.90	0.90	0.90	0.90

Table III.
Unstandardized coefficients from linear mixed effects on personal endorsement of search strategies for study 1

Notes: $n = 1,066$. [a]Strategy 1 is providing family policy information. Strategy 2 is avoiding inquiries about candidates' families. Strategy 3 is avoiding limited candidate pools by using open searches. Strategy 4 reflected search strategies that address social identity, disparities, and bias and served as the reference category for centered dummy codes. Past FRW attendance is uses centered dummy codes past attendance = 0.5, no attendance = −0.5 as does gender female = 0.5, male = −0.5. The main effects of strategy type were included in Model 5, but not included in this table to conserve space. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$; ****$p < 0.001$

Search strategy	Study 1					Study 2				
	B	SE	df	t	p	B	SE	df	t	p
Strategies addressing identity, disparities and bias	−0.01	0.07	5,883	−0.19	0.85	0.06	0.10	2,048	0.60	0.55
Providing family policy info	0.18	0.07	5,904	2.66	0.008	–	–	–	–	–
Avoiding personal questions about family	0.16	0.07	5,901	2.36	0.018	0.23	0.10	2,048	2.15	0.032
Avoiding limited candidate pool	0.23	0.07	5,890	3.36	< 0.001	0.37	0.10	2,048	8.82	< 0.001

Table IV.
Simple effects of FRW on endorsement for each strategy type from LME model

attendance was primarily associated with greater endorsement of recommendations to: provide family policy information to all candidates, avoid seeking personal details about candidates' families and avoid limiting the candidate pool by implementing an open search; however, past FRW attendees were no more likely to endorse recommendations to conduct equitable search and review strategies that address identity, disparities and bias.

Discussion

These results provide initial evidence that attending the FRW can influence attitudes toward evidence-based search strategies to promote faculty diversity through hiring. Analyses of endorsement of 13 equitable search strategies (e.g. use open searches; avoid asking personal questions of candidates) showed that faculty were more likely to endorse these strategies if they themselves had attended an FRW in the past three years or if more people in their department had. Even faculty who had not attended a workshop themselves were more likely to endorse these strategies if they were in a department where more of their colleagues had attended one, suggesting that a norm of equitable search strategy endorsement developed and spread in departments with high departmental FRW attendance. These results are promising given the importance of an institutional climate supportive of sustained change.

There was also suggestive evidence that the FRW increased intentions to engage in behaviors consistent with the equitable search strategies. Intentions to object to speculations on a candidate's motives about the job were increased after attending the FRW in the pre-post FRW analyses. However, objecting to discussions of the potential role of a candidate's partner in whether they would take the job appeared to depend on how the question was phrased (see footnote 1). This suggests that researchers should vary the wording of behavioral intention items to decrease the tendency for respondents to respond in a way that seems expected or desired. Finally, in either version of the item used, behavioral intentions to object to non-diverse shortlists were not affected by individual FRW attendance, indicating that this topic may be a particularly difficult issue in equitable faculty searches. There may be strong dissent to the idea of changing a homogenous (i.e. all male) shortlist especially after an effortful applicant review process, whereas it is easier to consider objecting to speculation on a candidate's motives and partner issues.

Analyses of the disaggregated equitable search strategies shows that consistently, FRW attendance was less effective at promoting more positive attitudes toward equitable search and review strategies that address social identities, disparities and bias (e.g. "Avoid interviewing only one candidate from a particular social group, e.g., gender or race"). This aligns with research demonstrating that people are often less receptive to diversity messages that directly mention group differences (Kidder *et al.*, 2004), and may be also be consistent with the noted resistance to object to non-diverse short-lists (which also involves calling direct attention to social identities). In sum, these findings suggest that attending the FRW can successfully impact many attitudes relevant to getting faculty on board with more equitable search strategies, but more can be done to bolster the effects of the workshop on other attitudes and behavioral intentions.

Study 2

Although evidence-based workshops like the FRW have demonstrated positive effects, it remains to be tested whether these are at least in part attributable to greater belief in the social science principles (e.g. gender schemas, implicit bias, accumulation of disadvantage) highlighted by these workshops. Study 2 was designed to directly test whether the education provided on these social science findings underlie the effects of the FRW. Study 2 thus aimed to replicate the effect of FRW on endorsement of equitable search strategies and test whether

they were mediated by increased belief in the social scientific principles (e.g. the belief that stereotyping and implicit biases occur and affect outcomes for women and URM individuals) highlighted in the FRW. The sampling in Study 2 also allowed comparison of the long-term effects of the FRW (i.e. comparing beliefs and attitudes of those who had attended an FRW any time in the past to those who had never attended) as well as short-term effects (i.e. comparing those who had recently attended to those who never attended).

Method and measures
The design of Study 2 was similar to Study 1, with two differences. First, belief in the social science principles was measured. Respondents used a scale of 1 (strongly disagree) to 5 (strongly agree) to indicate agreement with five statements corresponding to evidence-based information from the FRW, for example, "Our assumptions about a person's traits and abilities can subconsciously influence hiring decisions." Second, the items assessing personal endorsement of equitable search strategies was modified from 13 to 12 items, and included additional strategies beyond those examined in Study 1 to match changes in the strategies most heavily emphasized in the FRW at the time (e.g. avoiding early ranking of candidates; $\alpha = 0.62$; see Appendix for items). Some items with the same content were also reworded to reduce potential ceiling effects and acquiescence bias. Because the items were different, we conducted another EFA to explore effects on different strategy types. This resulted in a factor for search and review strategies addressing identities, disparities, and bias ($\alpha = 0.77$), another for strategies to avoid limiting the candidate pool ($\alpha = 0.60$), and three single items that did not load strongly onto a single factor. Only one single-item index was retained because it was a collapsed version of a key factor identified in the previous study (one item for avoiding personal inquiries about both partners and children). This left three key strategy types of interest as the focus of exploration (see Table V).

Participants
A total of 468 tenured/tenure-track faculty were recruited in 2015 and 2016 to participate in Study 2. Among them, 344 were registered to attend the FRW during the study period and 124 were not. Overall, 63 percent were men and 37 percent were women; nearly one-quarter (23 percent) were faculty of color (12 percent were Asian/Asian American faculty and 11.3 percent were URM faculty). Half of all respondents were full professors (54.5 percent), and the remaining were associate (25.6 percent) or assistant (20 percent) professors.

Like Study 1, our primary analyses used past FRW attendance to test whether people who had attended an FRW in the past differed from those who had not attended. Because there were fewer people in this sample who had attended in the three years prior to the study ($n = 30$), we also included faculty who attended the workshop any point since attendance data were first recorded (2003; $n = 105$) to compare to those who had never attended ($n = 333$).

We also used a secondary comparison comparing the post-FRW responses for those who attended an FRW and completed the post-FRW survey during the study period ($n = 212$) to the control group who did not attend an FRW ($n = 124$). In other words, the primary comparison tested the longer-term effects of having attended an FRW at any point in the past; the secondary comparison tested the short-term effects of having attended an FRW within the same semester as completing the survey. Analyses testing the longer-term effects were selected as the primary comparison reported because they provide a more conservative test of hypotheses and a closer match to the group comparisons in Study 1. We focus results on the primary (long-term) comparison; any notable differences between the primary and secondary (short-term) comparisons are identified below.

	Factor 1	Factor 2	Factor 3
1. Encourage search committee members to be vigilant about unconscious bias throughout the search	*0.71*	0.06	0.03
2. Actively search for potential faculty recruits from institutions that train diverse students	*0.71*	0.02	−0.06
3. Provide applicants with a checklist and clear instructions about the application process	*0.60*	−0.15	0.13
4. Systematically use defined criteria in evaluations such as by relying on a candidate evaluation tool	*0.54*	−0.30	0.10
5. Make it a priority to bring in more than one female/racial-ethnic minority candidate for an interview	*0.60*	0.02	−0.17
6. Take steps to ensure a diverse audience for the candidate's job talk	*0.46*	0.10	−0.08
7. Discourage speculation among search committee members of the likelihood that a candidate would accept the job if offered	*0.40*	0.10	0.08
8. In the job posting, state very specific areas of expertise as required for the position (reverse scored)	−0.16	*0.69*	0.01
9. Develop a rank order of candidates as early in the search process as possible (reverse scored)	0.01	*0.64*	−0.03
10. Try to find out whether candidates have a partner or children so that you can provide information about dual career services/family friendly policies to them (reverse scored)	0.23	0.34	0.42
11. Inform candidates that you are especially interested in them because of the diversity they will bring to your department (reverse scored)	0.06	0.31	0.38
12. Assign a faculty member to host the candidate's visit	0.09	0.04	−0.30
Cronbach's α for each factor	$\alpha = 0.77$	$\alpha = 0.60$	

Notes: Coefficients are standardized loadings from the pattern matrix. This EFA was conducted with principal axis factoring and an oblique promax rotation. The number of factors was determined through parallel analysis. Italic loadings are those that load strongly onto one factor at least 0.4 and no substantial cross-loadings. We extracted three factors, but the third factor did not have its own strong loadings and was not a substantive factor

Consistent with Study 1, we also tested the within-subject effect of time for the subset of participants who were registered for the FRW during the study period and completed both the pre- and post-FRW surveys ($n = 212$).

For the ANOVAs, the boxplots and a Levene's test showed no heterogeneity in the variance of strategy endorsement (primary comparison: $F(3, 449) = 0.75$, $p = 0.56$; secondary: $F(3, 332) = 0.57$, $p = 0.64$). There was heterogeneity for belief in social science principles, however (primary: $F(3, 445) = 4.77$, $p = 0.003$; secondary: $F(3, 327) = 5.00$, $p = 0.002$). Results of tests with Welch corrections were identical to those with conventional ANOVAs, and we report the conventional ANOVAs below for ease of interpretation, as in Study 1.

Results

Personal endorsement of equitable search strategies

FRW vs No FRW. Replicating Study 1, a 2 (FRW vs No FRW) × 2 (faculty gender) ANOVA revealed that faculty who had attended an FRW endorsed equitable search strategies more than those who had never attended ($F(1, 449) = 24.84$, $p < 0.001$, $\eta_p^2 = 0.05$). Although female faculty reported more endorsement of these strategies ($F(1, 449) = 24.84$, $p < 0.001$, $\eta_p^2 = 0.05$), the two-way interaction was not significant ($F(1, 449) < 0.001$, $p = 0.99$, $\eta_p^2 < 0.001$).

Pre-post analyses. A 2 (faculty gender) × 2 (time: pre- vs post-FRW) mixed model ANOVA with time as the within subjects factor revealed that faculty members were more likely to

endorse equitable search strategies after attending the FRW ($M = 4.29$, SD $= 0.51$) compared to before ($M = 3.98$, SD $= 0.44$; $F(1, 197) = 78.56$, $p < 0.001$, $\eta^2 = 0.29$). There was also a main effect of gender ($F(1, 197) = 5.51$, $p < 0.05$, $\eta^2 = 0.03$), but no interaction ($F(1, 197) = 1.36$, $p = 0.25$, $\eta^2 = 0.01$).

Belief in social science principles

FRW vs No FRW. A 2 (FRW vs No-FRW) × 2 (faculty gender) ANOVA revealed that faculty who had attended an FRW believed these social science principles more than those who had never attended ($F(1, 445) = 5.15$, $p = 0.02$, $\eta_p^2 = 0.01$; see Table II). Faculty gender also significantly predicted belief in these principles ($F(1, 445) = 53.90$, $p < 0.001$, $\eta_p^2 = 0.11$), but it did not interact with past attendance ($F(1, 445) = 1.56$, $p = 0.21$, $\eta_p^2 = 0.003$).

Pre-post analyses. We find the same pattern when testing for change in beliefs from pre- to post-FRW. A 2 (faculty gender) × 2 (time: pre- vs post-FRW) mixed model ANOVA, with time as the within subject factor, revealed that faculty members believed in the social science principles significantly more after attending the FRW than they did before ($F(1, 197) = 41.11$, $p < 0.001$, $\eta^2 = 0.17$). There was also a main effect of gender on beliefs ($F(1, 197) = 8.39$, $p < 0.01$, $\eta^2 = 0.04$), but no interaction ($F(1, 197) = 0.31$, $p = 0.58$, $\eta^2 = 0.002$).

Mediation analyses

Primary comparison: past FRW vs no FRW attendance. We next sought to test whether the effect of any previous FRW attendance (long-term effect) on general endorsement of equitable search strategies was mediated by belief in the social science principles. To do this, we estimated indirect effects in R using the Lavaan package (Rosseel, 2012). All mediation models used bias-corrected and accelerated bootstrapped standard errors with 5,000 bootstrapped samples. Analysis of the primary comparison showed the indirect effect was close to significance but did not meet conventional thresholds (indirect effect: $B = 0.04$, SE $= 0.02$, CI: [-0.003, 0.09]). This analysis thus gives weak evidence that belief in the social science principles help to explain the relationship between past attendance and general endorsement of equitable strategies (aggregated index).

To explore this question further, we also ran a mediation model to assess indirect effects on each specific strategy type (disaggregated index). These tests revealed that insofar as past FRW attendance predicted greater belief in the social science principles underlying the workshop, faculty were more likely to endorse search and review strategies that address identities, disparities and bias ($B = 0.07$, SE $= 0.03$, CI: [0.02, 0.13]), that avoid limiting the candidate pool ($B = 0.04$, SE $= 0.02$, CI: [0.01, 0.08]), and that avoid asking personal details about partners and children ($B = 0.08$, SE $= 0.03$, CI: [0.03, 0.15]). None of these indirect effects were moderated by gender (|z| for all indices of moderated mediation < 1.6). In sum, these findings suggest that belief in the evidence-based portions of the workshop helps to explain the effect of FRW attendance on endorsement of three key strategy types (see Figure 2).

Secondary comparison: recent FRW vs no FRW attendance. Comparing differences between faculty who just attended the FRW and those who never attended (short-term effect), belief in social science principles did help to explain differences in general endorsement of equitable strategies, aggregate index ($B = 0.19$, SE $= 0.03$, CI: [0.13, 0.25]). Furthermore, the indirect effect was significantly different for men and women (index of moderated mediation: $B = -0.24$, SE $= 0.06$, CI: [-0.36, -0.14]). Specifically, belief in social science principles mediated the short-term effect of FRW attendance on general personal endorsement among men ($B = 0.49$, SE $= 0.07$, CI: [0.35, 0.63]), but not among women ($B = -0.11$, SE $= 0.08$, CI: [-0.27, 0.05]).
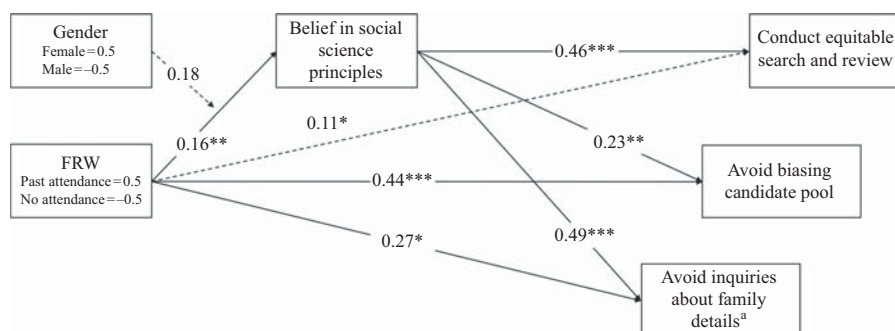
Notes: This model uses the primary comparison (long-term effects). Dashed lines show non-significant paths. Indirect effect on strategies to address identity, disparities, and bias: $B = 0.06$, SE = 0.03, 95% CI: (0.02, 0.12). Indirect effect on avoiding biased candidate pools: $B = 0.04$, SE = 0.02, 95% CI: (0.01, 0.08). Indirect effect on avoiding inquiries about family: $B = 0.09$, SE = 0.04, 95% CI: (0.03, 0.17). $*p<0.10$; $**p<0.05$; $***p<0.01$; $****p<0.001$

Examining this relationship separately for each strategy type reveals a consistent pattern. Beliefs in the social science principles helped to explain greater endorsement of strategies that address search and review strategies addressing identities, disparities and bias ($B = 0.24$, SE = 0.04, CI: [0.17, 0.33]), that avoid limiting the candidate pool ($B = 0.18$, SE = 0.05, CI: [0.10, 0.28]), and that avoid asking personal details about partners and children ($B = 0.22$, SE = 0.06, CI: [0.12, 0.34]). For this comparison, all significant indirect effects were also moderated by gender (|z| for all indices of moderated mediation > 3); specifically, increased belief in these social science principles explained greater endorsement of three key strategy types among men who had just attended the workshop, but not women who had just attended.

Mixed models with department-level effects
Departmental attendance and general personal endorsement (aggregate index). We ran linear mixed-effect models to test whether faculty's general endorsement of equitable search strategies is influenced by their own past FRW attendance as well as by the percentage of faculty in their department who have attended using the primary analysis comparison. We specified the same five models as Study 1 (see Table VI for all models).

Departmental FRW attendance predicted endorsement on its own (Model 1, $p < 0.05$) and with gender in the model (Model 2, $p < 0.05$). However, unlike in Study 1, this effect disappeared when individual FRW attendance was added to the model (Models 3, 4 and 5). Instead, individual FRW attendance remained a significant predictor in Models 3, 4 and 5 ($p < 0.001$). There was a marginally significant interaction between gender and department-level workshop attendance, but this weak effect disappeared when other variables were added to the model, providing insufficient evidence that gender and departmental attendance interact. Results were similar using the secondary comparison (short-term effect).

Departmental attendance and endorsement of specific strategy types (disaggregated index). The significant interaction in Model 5 suggested again that individual FRW attendance was more effective for some strategies more than others (see Table VI). Consistent with Study 1, the interaction suggested that individual FRW attendance was more predictive of endorsement of strategies to avoid limiting the candidate pool than for those that address identity, disparities and bias. Simple effects reveal that individual FRW attendance was predictive of greater endorsement of all strategies except for those that address identity, disparities and bias (see Table IV).

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5
Fixed effects					
Intercept	3.60***	3.62****	3.69****	3.69****	3.70****
Departmental attendance	0.75****	0.67***	0.36	0.36	−0.36
Gender		0.18***		0.21***	0.21***
Individual attendance			0.28****	0.26****	0.26****
Dept. attendance × Gender		0.57*		−0.69	−0.69
Dept. attendance × Individual attendance			−0.78*	−0.63	−0.63
Gender × Individual attendance				0.12	0.12
Dept. attendance × Gender × Individual attendance				−0.48	−0.48
Individual attendance × Strategy 1[a]					0.17
Individual attendance × Strategy 2[a]					0.31**
Random effects in SD					
Intercept for Strategy Type	0.53	0.53	0.53	0.53	0.53
Intercept for Participant	0.32	0.30	0.31	0.29	0.29
Intercept for Department	0.13	0.15	0.12	0.14	0.14
Residual	0.93	0.93	0.93	0.94	0.93

Notes: $n = 453$. [a]Strategy 1 is avoiding inquiries about candidates' families. Strategy 2 is avoiding limited candidate pools by using open searches. Strategy 3 reflected search strategies that address social identity, disparities, and bias and served as the reference category for centered dummy codes. Past FRW attendance is uses centered dummy codes past attendance $= 0.5$, no attendance $= −0.5$ as does gender female $= 0.5$, male $= −0.5$. The main effects of strategy type were included in Model 5, but not included in this table to conserve space. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$; ****$p < 0.001$

Table VI.
Unstandardized coefficients from linear mixed effects on personal strategy endorsement for study 2

Discussion

Results of Study 2 replicated and extended findings from Study 1. Personal endorsement of equitable search strategies was again greater among those who previously attended an FRW, a pattern that was corroborated by pre-post FRW attendance analyses. In addition, FRW attendance was associated with greater belief in the social science research principles emphasized in the workshop, a pattern apparent in both methods of comparison. Importantly, there was evidence that these beliefs mediated the relationship between FRW attendance and increased endorsement of equitable search strategies. Although the evidence was somewhat mixed for when examining more long-term effects of FRW attendance, the role of beliefs was clear in the short term – particularly for men. This finding suggests that educating people (especially men, who constitute the majority of many departmental faculties) about social science research principles may play an important role in determining their attitudes about equitable search practices soon after attending the FRW.

The mediation analysis using the primary comparison, which included faculty who attended the FRW longer than three years ago did not show strong evidence that social science belief endorsement mediated the effect of FRW attendance on general endorsement of equitable search strategies (aggregate index). However, exploring these relationships for specific strategy types separately revealed significant indirect effects for strategies addressing identity, disparities and bias, for avoiding limiting candidate pools, and for avoiding personal inquiries about family and children. These analyses suggest that insofar as FRW attendance leads to greater belief in the social science principles underlying the workshop, people are subsequently more likely to endorse even those strategies that seem most resistant to change – those that address social identity, disparities and bias more directly. The significant indirect effect absent a significant direct or total effect for this strategy would suggest that there are likely psychological factors other than these beliefs that may be counteracting attitude change for this strategy. One potential opposing force may be the negative reactions evoked by strategies that call attention to group differences (Kidder *et al.*, 2004).

Results of mixed-effects analyses of department-level effects differed from Study 1; although proportion of one's department members who had attended an FRW predicted personal endorsement on its own, this effect was overwhelmed by individual FRW attendance in Study 2. Although it is unknown why this difference across studies emerged, it is possible that factors such as differences in proportions of departmental FRW attendance across the studies may have played a role, as this variable ranged from 0 to 67 percent in Study 1, and from 5 to 100 percent in Study 2. The difference in range likely reflects the increase in the total number of FRW attendees over time, as more faculty members joined search committees and were required to attend. Similar to Carnes *et al.*'s (2015) finding that the effect of departmental participation at a bias reduction workshop on faculty had a "tipping point" of approximately 25 percent, it may be that the effect of departmental FRW attendance levels off at a particular point, allowing the influence of individual FRW attendance to play a larger role among departments with departmental attendance exceeding this point.

General discussion

Across two studies spanning five years we find evidence that attending an ADVANCE FRW increased endorsement of equitable search strategies. Among samples of faculty members, individual FRW attendance was associated with greater personal endorsement of equitable search strategies (Studies 1 and 2) and greater intentions to behave consistently with those practices on two out of three items (Study 1). Endorsement of equitable search strategies was greater among faculty members when a greater proportion of their academic department colleagues had attended an FRW, even among respondents who had not attended an FRW themselves (Study 1). Finally, there was suggestive evidence that having recently attended an FRW increased endorsement of equitable search practices because attendance moves people (especially men) to accept the social science research principles on which the FRW is based (Study 2 secondary comparison). Belief in these social science principles also seemed to play a role in explaining more long-term effects of the FRW (Study 2 primary comparison), albeit more tenuously. As a whole, these studies provide empirical evidence that being exposed to an evidence-based equitable FRW can increase faculty members' beliefs in the social science research evidence on which it is based, leading to increased support of equitable search practices and intentions to enact those practices, and that this positive influence may be spread throughout a department the more that its members have attended the workshop.

Attending the FRW increased faculty members' acceptance and approval of equitable search strategies that could reduce the implicit biases contributing to the lower number of female and URM compared to male and white faculty members (Bertrand and Mullainathan, 2004; Moss-Racusin *et al.*, 2012; Stewart and Valian, 2018; but see Williams and Ceci, 2015 for an exception). Focusing on attitudes and behavioral intentions regarding equitable search practices extends efforts to document the impact of these initiatives beyond hiring statistics, i.e., the number of women and URM faculty hired. Demonstrating changes in faculty attitudes and behavioral intentions is important because relying only on changes in hiring numbers as evidence that these initiatives work might lead to underestimation of their potential. Sizable change in the ratio of female-to-male faculty in heavily male-dominated fields, for example, may be quite slow to emerge, given that often very few faculty members are hired in any given year. Moreover, retention of underrepresented faculty can be reduced by factors such as negative department climate (Jordan and Bilimoria, 2007; Xu, 2008). The current results demonstrate that faculty diversity initiatives such as the FRW can increase faculty members' approval of equitable search practices and intentions to enact them, two key ingredients in sustaining and normalizing the use of equitable search procedures that can ultimately lead to significant increases in faculty diversity (Stewart *et al.*, 2016).

The finding that endorsement of equitable search strategies was greater among faculty members when a greater proportion of their department colleagues had attended an FRW

offers the possibility that attending an evidence-based faculty recruiting workshop can lead to changes in institutional climate. When more of a department's members have learned about the social science findings presented in the workshop, this may provide a shared vocabulary and set of knowledge that changes the way they think about faculty diversity, such that the departmental culture becomes one of endorsing and supporting equitable searches. However, it is important to note in Study 2, the influence of one's own individual FRW attendance was stronger than departmental FRW attendance, perhaps because the proportions of department members who had attended an FRW were larger in Study 2 compared to Study 1. Other factors, such as unmeasured changes in departmental "politics" or leadership may have also played a role (Jordan and Bilimoria, 2007; Stewart *et al.*, 2016). In any case, it is an exciting possibility that the message promoting equitable search strategies can spread in some circumstances within an academic environment, even to those who have not directly received the message by attending the workshop themselves.

We predicted that exposure to a social science evidence-based workshop would increase endorsement of equitable search strategies because this exposure leads people to become more aware and convinced of the prevalence and impact of phenomena such as implicit bias, gender stereotyping and the accumulation of disadvantage. This mediation model was significant in analyses involving faculty members who had recently attended the FRW, suggesting that belief in these biases partially explain the immediate effects of the FRW. Moreover, the indirect effect was moderated by gender, such that men's endorsement changed due to changes in their awareness and belief in the social science principles more than women's endorsement did. This suggests the value of evidence-based initiatives to influence the most prevalent social identity group among faculty in many departments: men. Of importance, the mediation model was not significant in analyses including faculty who had attended the FRW longer ago. The indirect effect was marginally significant for long-term effects on attitudes toward search strategies, and significant in analyses examining separate pathways for disaggregated strategy types; however, the evidence is simply not as strong for long-term effects as they are for short-term effects. Nevertheless, the finding that having more recently attended the FRW had a stronger effect on outcomes supports a policy of receiving the training more than once, or being recertified at regular intervals. Having this "booster" training may foster more sustained change in attitudes and behavioral intentions.

Although the current studies show clear differences between those who had not attended an FRW and those who had, a strong causal explanation is not warranted due to lack of random assignment to groups, as faculty respondents were not randomly assigned to attend or not attend the FRW. However, it is important to note that faculty also did not necessarily "self-select" into groups because for the majority (65 percent in Study 1 and 68 percent in Study 2), attendance was a requirement of being able to serve on their department's search committee (and others were not required but likely strongly encouraged to attend). In addition, several key characteristics of the faculty respondents, including rank, race/ethnicity and whether they were in STEM or non-STEM departments could not be reliably analyzed due to small cell sizes in analyses including these factors. Future research should examine the potential role of these factors, in order to determine whether initiatives such as the FRW should be changed to be more effective for different types of audiences.

Given the importance of both attitudes and behavioral intentions for promoting intentional behavior (Ajzen, 1991), the present findings contribute to our understanding of how social science evidence-based FRWs can promote equitable searches. The more members of a department, organization, or institution have received an educational and persuasive message about the value of faculty diversity and how to reduce unintended evaluation bias in faculty searches, the closer they can come to achieving a more inclusive environment that fosters excellence in their constituencies.

Note

1. This rewording was intended to reduce socially desirable responding, i.e., claiming that one would refuse to discuss candidates' partners during applicant review, or object to non-diverse shortlists. See Appendix for both versions of the items.

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Appendix

Personal endorsement of equitable search practices (Study 1)
Instructions: please rate your perception of the following job search practices in terms of what you personally think is important to conduct an effective and successful job search.

Response scale: 1 "Not at all important" to 5 "Very important":

(1) Engage in active recruiting of specific individuals prior to the official opening of the search.

(2) Focus the search on narrow content areas rather than using a broad or "open search." (reverse scored)

(3) Be mindful of the composition of the search committee in terms of gender and race/ethnicity.

(4) Ensure that every candidate receives family friendly policy information.

(5) Ensure that every candidate receives dual career policy information.

(6) Decide and agree on specific applicant review criteria before the search begins.

(7) Use specific criteria (such as a candidate evaluation tool) in review of candidates.

(8) Take steps to reduce the influence of unconscious bias during applicant review.

(9) Avoid interviewing only one candidate from a particular social group (e.g. gender or race).

(10) During the visit, ensure that the candidate meets a wide variety of people from various social groups (e.g. gender or race).

(11) During the visit, show we are a "family friendly" department by asking job candidates about their children and families. (reverse scored)

(12) Avoid referring to a candidate in terms of his or her social group membership (e.g. as the woman or the minority candidate).

(13) Try to find out if the candidate has dual career issues by asking if he or she has a partner. (reverse scored)

Personal endorsement of equitable search practices (Study 2)
Instructions: please rate your perception of the following job search practices in terms of what you personally think is important to conduct an effective and successful job search.
Response scale: 1 "Not at all important" to 5 "Very important":

(1) Actively search for potential faculty recruits from institutions that train diverse students.

(2) In the job posting, state very specific areas of expertise as required for the position. (reverse scored)

(3) Systematically use defined criteria in evaluations (such as by relying on a candidate evaluation tool).

(4) Encourage search committee members to be vigilant about unconscious bias throughout the search.

(5) Make it a priority to bring in more than one female/racial-ethnic minority candidate for an interview.

(6) Take steps to ensure a diverse audience for the candidate's job talk.

(7) Try to find out whether candidates have a partner or children so that you can provide information about dual career services/family friendly policies to them. (reverse scored)

(8) Inform candidates that you are especially interested in them because of the diversity they will bring to your department. (reverse scored)

(9) Develop a rank order of candidates as early in the search process as possible. (reverse scored)

(10) Assign a faculty member to host the candidate's visit.

(11) Discourage speculation among search committee members of the likelihood that a candidate would accept the job if offered.

(12) Provide applicants with a checklist and clear instructions about the application process.

Behavioral intentions (Study 1)
Instructions: please indicate the likelihood of how you would respond to the following job search scenarios.
Response scale: 1 "Not at all likely" to 5 "Very likely":

(1) If a fellow search committee member were to speculate that a candidate is highly unlikely to leave his or her current institution for [our university], how likely are you to say that this type of speculation is not appropriate?

(2) If a fellow search committee member were to speculate that a candidate is highly unlikely to choose a Midwestern university such as [our university], how likely are you to say that this type of speculation is not appropriate?

(3) If a fellow search committee member were to bring up a candidate's partner during the review discussion, how likely are you to engage in the discussion of the partner? (reverse scored)

- If your search committee were to bring up a candidate's spouse or partner during the review discussion, how likely are you to say that spouses and partners should not be discussed until after an offer is made? (reworded version)

(4) If my search committee came up with a shortlist that did not include any women or under-represented minorities, how likely are you to call attention to that fact?

- If, after a long review process, your search committee came up with a shortlist that did not include any women or underrepresented minorities, how likely are you to assert that the list is acceptable as it is? (reworded version)

Beliefs about bias (Study 2)
Instructions: please rate your agreement with the following statements.
Response scale: 1 "Strongly Disagree" to 5 "Strongly Agree":

(1) Although some people make assumptions about others' traits and abilities that are based on social group membership (such as gender or race-ethnicity), most people do not. (reverse scored)

(2) Our assumptions about a person's traits and abilities can subconsciously influence hiring decisions.

(3) Small instances of gender bias can accumulate to produce large disparities between men's and women's outcomes over time.

(4) Even though stereotypes exist about gender and race, women and racial-ethnic minorities are not affected by them. (reverse scored)

(5) Institutions often sacrifice quality in their efforts to increase diversity in hiring. (reverse scored)

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