Journal of Experimental Social Psychology 82 (2019) 294–306

Contents lists available at ScienceDirect

Journal of Experimental Social Psychology

journal homepage: www.elsevier.com/locate/jesp

Blind to bias: The benefits of gender-blindness for STEM stereotyping

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ARTICLE INFO

Handling Editor: Elizabeth Page-Gould

Keywords:
Stereotyping
Gender
Gender-blindness
Diversity ideologies
STEM

ABSTRACT

Women continue to be underrepresented in STEM (science, technology, engineering, math) fields. As such, there has been an increased interest in interventions to reduce bias against, and increase inclusion of, women in STEM. In this paper, we compare and contrast two commonly used strategies: awareness and blindness. We demonstrate that gender-blindness—a diversity ideology that advocates for downplaying gender differences, rather than embracing them—has the potential to diminish stereotyping of women in STEM fields. In six total studies, we show that men who believe, or are primed with, gender-blindness (compared to gender-awareness) are less likely to endorse gender stereotypes around women's STEM competencies. By measuring (Study 1) and manipulating (Studies 2–5) gender-blindness, we show that gender-blindness (compared to awareness) minimizes the gender gap on explicit stereotyping measures, as well as diminishes STEM stereotyping in target evaluations. Across six studies, we show the influence of diversity ideologies on stereotyping of women in STEM.

Women are underrepresented in some of the most powerful companies in the world (Ovide & Molla, 2016), many of which are in STEM fields (science, technology, engineering, math). Indeed, STEM companies have the largest market value (Associated Press, 2018), are the highest paying (NACE, 2016), and have a large impact on the global economy (World Bank, 2016). Thus, women's underrepresentation in STEM presents a significant barrier to gender equality. Many have discussed the role of gender stereotypes in addressing representation and inclusion and continue to seek interventions to reduce stereotyping (Cheryan, Master, & Meltzoff, 2015; Nosek et al., 2009). In this paper, we suggest that gender-blindness—a diversity ideology that advocates for downplaying gender differences—is a more effective intervention than gender-awareness—a diversity ideology that advocates for embracing gender differences—for diminishing stereotyping of women in STEM fields. Contrasting gender ideologies to race ideologies, we show that effective strategies for reducing racial bias (race-awareness), backfire when applied to gender, rendering a "gender-blind" approach more effective. In doing so, we show both the danger of embracing, as well as the potential of blinding, gender differences for women's opportunities in STEM.

1. Diversity ideologies as strategies for intergroup equality

Diversity ideologies—or beliefs and practices regarding how to approach group differences in diverse settings—have been studied as one set of strategies to promote intergroup relations (Galinsky et al., 2015; Rattan & Ambady, 2013; Sasaki & Vorauer, 2013). Though more recently, scholars have developed newer and nuanced approaches to diversity, the majority of research has focused on *awareness* and *blindness* ideologies. While both awareness and blindness ideologies *can* be conceptualized as approaches that support inequality (e.g., segregation of groups or assimilation into a White-dominated culture; see Hahn, Banchefsky, Park, & Judd, 2015 and Knowles, Lowery, Hogan, & Chow, 2009), they are often discussed and conceptualized as strategies to promote positive and harmonious intergroup relations (Galinsky et al., 2015; Plaut, 2002; Rattan & Ambady, 2013). Thus, we focus on benevolent forms of these ideologies, ostensibly aimed at achieving equality and inclusion, as both have been proposed as interventions to do so. *Awareness* approaches recommend acknowledging and celebrating intergroup differences, whereas *blindness* approaches advocate for reducing and ignoring category membership (Plaut, 2002; Sasaki & Vorauer, 2013).

2. Race ideologies and their effects on stereotyping and bias

While the focus of this paper is on gender ideologies, the majority of research on diversity ideologies has examined the context of race. In the United States, where Black-White are primarily studied, awareness (multiculturalism) has often proven more positive than (color)blindness for reducing bias and promoting positive intergroup relations (Plaut,

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https://doi.org/10.1016/j.jesp.2018.11.003
Received 6 August 2017; Received in revised form 2 November 2018; Accepted 16 November 2018
Available online 23 January 2019

Thomas, Hurd, & Romano, 2018; Sasaki & Vorauer, 2013). Although some research has shown that strategies which minimize racial differences (i.e., personalization and de-categorization) can be successful in promoting positive interracial relations (Dovidio, Gaertner, & Kawakami, 2003, but see Park & Judd, 2005), for these strategies to be effective, Whites must first engage with, and acknowledge, *personal* differences (which often rely on social identities and cultural backgrounds). By ignoring race altogether, Whites forfeit opportunities to learn about and engage with important cultural traditions, experiences, and backgrounds that affect racial minorities' individual realities (Bonilla-Silva, 2003). Thus, instead of suppressing and ignoring differences in cultural identities and experiences, race-awareness allows Whites to engage in, and understand, the different experiences and cultures of racial minorities, rather than assimilating them into a White-dominated society (Markus, Steele, & Steele, 2000).

By highlighting differences, race-awareness has the potential to increase cultural stereotyping (e.g., sports, music; Gutiérrez & Unzueta, 2010), improve stereotype accuracy (e.g., incarceration rates; Wolsko, Park, Judd, & Wittenbrink, 2000), and relieve suppression of negative stereotypes (e.g., threatening; Richeson & Nussbaum, 2004) amongst Whites. Though the endorsement of these stereotypes can have their own insidious effects (e.g., positive stereotype threat, minority spotlight; Zou & Cheryan, 2015), there are also positive consequences of such awareness, including an increased understanding and acceptance of stereotypical cultural practices (Gutiérrez & Unzueta, 2010; Wolsko, Park, & Judd, 2006), recognition of the negative and stereotypical ways racial minorities are perceived (Apfelbaum, Pauker, Ambady, Sommers, & Norton, 2008), and alleviation of anxiety over such recognition (Richeson & Nussbaum, 2004). In other words, the stereotypes about Blacks evoked when Whites receive awareness messages seem to surround cultural stereotypes with specific content regarding activities (e.g., sports), experiences (e.g., treatment), and judgments (e.g., threat). Thus, though this strategy has the potential to backfire, it also has the potential to increase interest in (Vorauer, Gagnon, & Sasaki, 2009) and perspective taking of (Todd & Galinsky, 2012) racial minorities' cultural experiences.

Indeed, many African Americans prefer race-awareness to race-blindness (Wolsko et al., 2006) and those who endorse multiculturalism also tend to endorse ingroup stereotypes (Ryan, Hunt, Weible, Peterson & Casas, 2007), suggesting the endorsement of such cultural stereotypes is not necessarily seen as negative. In sum, awareness seems to heighten salience of racial minorities' (often positive) cultural or experiential differences, an assumption we test in Study 2.

3. Gender ideologies and their effects on stereotyping and bias

Given the benefits of a race-aware approach, both academic researchers (Baron-Cohen, 2003; Galinsky et al., 2015) and popular press writers (Annis & Merron, 2014) have argued that embracing gender differences in the workplace may be an effective strategy to improve women's equality. Despite these beliefs, little research has examined the effects of awareness and blindness ideologies on gender relations (but see Koenig & Richeson, 2010a, 2010b; Hahn et al., 2015; Martin & Phillips, 2017), making it unclear whether an awareness strategy is actually beneficial for gender stereotyping and bias. This becomes increasingly important as there are many differences between gender and race, especially in the content of stereotypes. For gender, stereotypes tend not to be the same cultural stereotypes as held for race; but rather, complimentary gender-role stereotypes (Eagly, 1997, 2013).

Regarding gender stereotypes, people stereotype men and women on their interests, personalities, and skills. In the workplace domain, they associate men and women with different, complimentary abilities, believing that men are better at skills that require logic and problem-solving (such as STEM) and women are better at skills that require empathy and nurturing (such as care-taking; Diekman & Eagly, 2000). These gendered stereotypes are seen as positive, functional, and readily endorsed (Eagly, 2013). Thus, the idea that we should embrace gender differences is held by many. For example, Baron-Cohen (2003) has argued that it is beneficial to be "gender-aware" as men and women have different skills, with men being better scientists, engineers, and programmers and women being better counselors, teachers, and personnel staff (p. 287). Others have suggested that male and female brains operate differently, and that understanding these cognitive differences leads to better communication and performance at work (Gurian & Annis, 2008). Consistent with these arguments, an infamous memo describing women's underrepresentation at Google Inc., argued that cognitive differences between men and women made women less suited for STEM careers (Damore, 2017).

Thus, unlike the cultural stereotypes being highlighted through race-awareness, the stereotypes likely to be affected for gender revolve around gender-roles in abilities and skills. Although awareness ideologies have been posited as effective strategies to combat inequality (Galinsky et al., 2015; Plaut, 2002), we argue that due to associations with men and STEM competencies, an awareness ideology for gender may draw attention to STEM stereotypes, highlight a lack of fit for women in STEM roles, and exacerbate gender biases that are already salient and explicitly endorsed in STEM settings.

Due to the specific and highly endorsed gender role stereotypes that exist between men and women, past research has found that strategies designed to minimize differences (such as de-categorization and personalization; Hahn et al., 2015; Martin & Phillips, 2017) can reduce gender-role stereotypes and biological attributions for them. For example, some work has found that gender-blindness reduces gender bias in men's evaluations of and behavior towards agentic (i.e., counter-stereotypic) female leaders (Martin, Phillips, & Sasaki, 2016) and can change women's identification with masculine traits (e.g., assertive, leader-like; Martin & Phillips, 2017). Even anecdotally, powerful women in tech have preferred gender-blindness. Marissa Mayer, former CEO of Yahoo!, notes that being "gender-aware" would have made her self-conscious (Martin & Phillips, 2017) and Stitch Fix CEO, Katrina Lak, has resisted gender labels ("female CEO"), arguing that CEO success has nothing to do with gender (Steinmetz, 2018). Thus, both empirically and anecdotally, it seems that gender-blindness has the potential to reduce gendered associations that limit women in STEM fields.

4. Implications of explicit stereotyping for women's opportunities in STEM

Stereotyping can have damaging consequences, thus much research has been devoted to interventions that reduce or alter stereotypes (see Lai et al., 2014 for review). These interventions generally come in two forms: those that seek to reduce the application of stereotypes (*explicit stereotyping*) and those that seek to reduce the strength of the cognitive association between a stereotype and the target group's members (*implicit stereotyping*; Dovidio, Kawakami, & Gaertner, 2000). While we examine the effects of gender-blindness on both implicit and explicit stereotyping (see Footnote 1), we are most interested in reducing the *application*, rather than the *knowledge*, of a stereotype. Devoid of cognitive demands, explicit beliefs most strongly impact target evaluations (Dovidio, Kawakami, & Gaertner, 2002; Fazio, Jackson, Dunton, & Williams, 1995), and while most individuals know the content of stereotypes, it is those who are higher in prejudice who are most likely to apply them (Devine, 1989; Hugenberg & Bodenhausen, 2003).

Further, we examine STEM stereotypes, as they represent pernicious and persistent gender stereotypes. Though women have increased their representation in many historically "male-dominated" fields (American Bar Association, 2014; Moran, 2015), women continue to represent only 20% of undergraduates in computer science and engineering programs (National Science Foundation, 2013). Since women are underrepresented in these fields, it perpetuates social role stereotyping (Koenig & Eagly, 2014), which supports the assumption that men are more competent in STEM and acts as a barrier for women in STEM fields (Cheryan et al., 2015).

Though STEM fields require skills like creativity and imagination, the cognitive stereotypes associated with men (e.g., mathematical, problem solving), represent one of the greatest barriers to women's underrepresentation in STEM occupations (Cheryan et al., 2015). Past research has shown that altering these stereotypes significantly increases girls' interest in, and reduces men's bias towards women in, STEM fields (Cheryan et al., 2015; Diekman, Clark, Johnston, Brown, & Steinberg, 2011). For example, Cheryan, Plaut, Davies, and Steele (2009); Cheryan et al. (2015) found that changing stereotypes about computer scientists (e.g., solitary) or removing stereotypically “male” cues (video games) from classrooms led women to demonstrate more interest in STEM.

Although changing the stereotypes associated with STEM is sure to be useful, there is also potential to change the way people construe gender altogether. In the context of STEM Cheryan and Plaut (2010) find that amongst a number of predictors, women's feelings that they were dissimilar to others in STEM, was the strongest predictor of their underrepresentation in STEM. Thus, if gender-blindness can diminish salient and endorsed gender-role stereotypes, it is likely that it can also offer an intervention to reduce stereotyping against women in STEM fields.

5. Overview of studies

In Study 1, an a-priori power analysis, using the average effect size in social psychology ($r = 0.21$; Fraley & Marks, 2007; Richard, Bond Jr., & Stokes-Zoota, 2003), indicated we would need 173 participants to achieve adequate power to detect a correlation between gender-blindness and stereotyping ($1\text{-}\beta = 0.80$, $\alpha = 0.05$, $r = 0.21$). Subsequently, using the effect size found in Study 1 ($r = 0.26$), we determined a sample size of 55 participants per cell was ideal to test for the presence of our effect. We sought to collect at least this sample size in each study where possible. Further, we focus on majority group members, as minority groups tend to endorse diversity ideologies differently, and oftentimes have unique reactions to them (Ryan et al., 2007). However, we include women in Studies 2 and 3a for exploratory purposes. In Study 1, we examine the relationship between dispositional gender-blindness and gender-STEM stereotyping. In Study 2 we include race stereotypes and targets to show the unique stereotypes affected by diversity ideologies for race and gender, and the relative lack of consequence for STEM stereotypes in the race domain. In Studies 2 to 5, we examine the effects of diversity ideologies experimentally, showing that relative to gender-awareness, gender-blindness reduces stereotyping, both overall (Studies 2–3), and of female targets, with direct and indirect effects on evaluations of their ambitions and performance (Studies 4–5). All materials can be found at https://osf.io/8mtdu.

6. Study 1: Measuring gender-blindness and STEM stereotyping

In Study 1, we examined the relationship between gender-blindness and STEM stereotyping, predicting a positive relationship between gender-blind endorsement and perceptions of women's competence in STEM skills. Further, while we predicted gender-blindness would relate to less stereotyping on multiple dimensions, we believed above and beyond other forms of stereotyping, we would find a robust positive relationship between endorsement of gender-blindness and male-STEM stereotyping.[1]

[1] We included several exploratory variables. Due to the concerns about social desirability, we included a measure of social desirability (Reynolds, 1982; He et al., 2015). Controlling for this variable did not affect results. In Studies 1 and 3, we also include measures of implicit bias and find mixed results. Due to the inconsistent results found for gender-blindness on implicit bias, we solely focus on explicit bias in this paper. Additionally, we included several "feminine" cognitive stereotypes, relevant to STEM (e.g., creative; see Diekman & Eagly, 2000) and did not find effects ($p = .71$). Finally, to examine implications of a gender-blind ideology above and beyond stereotyping, in Study 1, we measured explicit prejudice and support for affirmative action, finding gender-blindness is negatively related to explicit prejudice ($r = -0.21$, $p < .01$) and positively related to support for affirmative action ($r = 0.28$, $p < .001$). All results available in SOM.

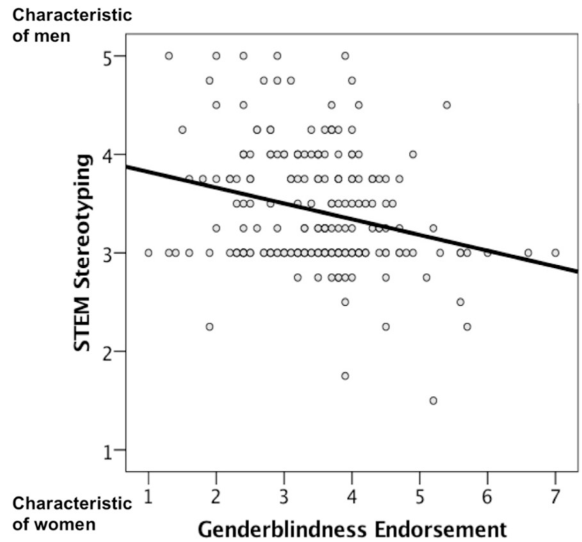

Fig. 1. Relationship between gender-blindness and STEM stereotyping in Study 1.

6.1. Participants and procedures

Two hundred and thirty-six male participants were recruited from Amazon's Mechanical Turk to take part in a survey on “Attitudes and Perceptions.” Sixteen participants were removed from analysis for failing one of two attention checks (see SOM), leaving a final sample of 210 male participants, 75% of whom were White, with a mean age of 34.29 years ($SD = 10.33$).

6.2. Independent measure: Gender-blindness

We measured gender-blindness using the *gender-blindness scale* (see Martin, 2018 for scale validation), where “awareness” items were reversed. Participants rated their agreement with 10-items on a scale from 1 = *strongly disagree* to 7 = *strongly agree* ($\alpha = 0.84$), where poles were counterbalanced. Sample items include, “we need to recognize and celebrate the differences between men and women to create an equal society,” and “focusing on differences between men and women undermines social cooperation and progress” (reversed). Suggesting that gender-awareness represents the baseline ideology, overall, men endorsed gender-blindness significantly less than gender-awareness, with the mean being significantly below the midpoint, $M = 3.49$, $SD = 0.98$; $t(209) = -7.61$, $p < .001$, $CI_{95} = -0.65, -0.39$.

6.3. Dependent variables

6.3.1. STEM stereotyping

To measure STEM stereotyping, we included explicit STEM-cognitive stereotypes (Diekman & Eagly, 2000), where participants were asked to indicate the extent to which they believed each trait was more or less characteristic of the average man or woman in society on a scale from 1 = *more characteristic of women* to 5 = *more characteristic of men* (poles counterbalanced). STEM traits included: analytic, mathematical,

Table 1
Correlations between variables in Study 1.[1]

		M	SD	1	2	3	4	5	6	7	8	9
1	Gender-blindness	3.49	0.98									
2	STEM stereotyping	3.42	0.61	−0.26***								
3	STEM implicit bias	0.22	0.35	0.01	0.15*							
4	Explicit STEM prejudice	3.45	1.72	−0.21**	0.40***	0.11						
5	Support for AA	3.67	1.46	0.28***	−0.32***	−0.03	−0.28***					
6	Agency stereotypes	3.73	0.67	−0.24***	0.56***	0.14†	0.26***	−0.16*				
7	Communal stereotypes	3.77	0.78	−0.23**	0.36***	0.20**	0.15*	−0.16*	0.52***			
8	Competence stereotypes	3.10	0.52	−0.01	0.36***	0.03	0.29***	−0.13†	0.14*	−0.14*		
9	Other STEM stereotypes	2.85	0.53	0.03	−0.07	−0.02	0.02	0.00	−0.25***	−0.46***	0.32***	
10	Social desirability	4.14	1.21	−0.08	−0.06	0.06	−0.08	0.01	−0.04	0.04	−0.02	−0.16*

[1] †$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

good with numbers, good at reasoning ($\alpha = 0.77$). Suggesting that these STEM stereotypes are more associated with men, participants were more likely to think these traits were characteristic of men than women overall, $M = 3.42$, $SD = 0.61$, $t(209) = 10.11$, $p < .001$, $CI_{95} = -0.34, -0.51$.

6.3.2. Additional stereotypes

We included a number of additional stereotypes, related to gender (agency, communality, and competence), to show the implications of gender-blindness on STEM stereotyping, above and beyond other dimensions that affect women in positions of power (Heilman, 2001; Rudman & Phelan, 2008). Participants rated the extent to which the following traits were characteristic of men and women, using the same scale as above: agency (assertive, aggressive, independent, competitive; $\alpha = 0.79$), communality (warm, kind, sensitive, nurturing; $\alpha = 0.89$), and competence (competent, intelligent; $r = 0.50$). Communality scores were reversed such that higher scores represent more traditional gender stereotyping.

6.4. Results

We find a negative relationship between gender-blindness and STEM stereotyping, such that men who endorsed gender-blindness more strongly were *less* likely to endorse male-STEM stereotypes, $b = -0.16$, $SE = 0.04$, $t(208) = -3.85$, $p < .001$, $CI_{95} = -0.24, -0.08$. See Fig. 1. We find that consistent with Martin (2018) gender-blindness was related to less agency, $b = -0.17$, $SE = 0.05$, $t(209) = -3.62$, $p < .001$, $CI_{95} = -0.26, -0.08$, and communality, $b = -0.18$ $SE = 0.05$, $t(209) = -3.44$, $p = .001$, $CI_{95} = -0.29, -0.08$, but not competence ($p = .86$). To show the importance and specificity of gender-blindness on STEM stereotyping, above and beyond other gender stereotypes, we conducted a multiple regression, controlling for other forms of stereotypes. We find that when including other variables in the model, the relationship between gender-blindness and STEM stereotyping remains significant, $b = -0.30$ $SE = 0.14$, $t(209) = -2.15$, $p = .03$, $CI_{95} = -0.58, -0.03$, while the relationships between gender-blindness and agency ($p = .32$), communality ($p = .17$), and competence ($p = .50$), are non-significant. See Table 1 for correlations.

6.5. Study 1: Discussion

Study 1 demonstrated the relationship between endorsement of gender-blindness and explicit gender stereotyping on STEM dimensions. We found that men who endorsed gender-blindness more strongly were also less likely to stereotype on STEM dimensions, believing that STEM traits were more characteristic of women compared to those lower on gender-blindness. It is interesting to note that, while gender-blindness was related to other gender-stereotypes (agency and communality), STEM stereotyping was most strongly affected. Past work has noted that STEM stereotypes remain some of the most strongly held (Cheryan et al., 2015), difficult to change (Diekman & Eagly, 2000), and explicitly endorsed (Baron-Cohen, 2003). Thus, the effects of downplaying differences might have been especially salient for these types of gender differences. Importantly, gender-blindness did not affect competence stereotyping of women, overall. Thus, endorsing gender-blindness is not necessarily associated with more positive impressions about women's competencies overall, but rather, specific, *masculine* STEM competencies. Together, these results demonstrate that gender-blindness relates to less gender-STEM stereotype endorsement.

7. Study 2: Manipulating gender and race diversity ideologies

Study 2 builds on and extends the findings of Study 1 in several ways. First, while Study 1 showed correlational evidence, it is unclear whether these ideologies can potentially be manipulated. In Study 2, we use the most common experimental manipulation in race-ideologies research (see Sasaki & Vorauer, 2013 for studies), adapted for gender, to examine whether gender-blindness can experimentally reduce gender-STEM stereotyping. Further, we examine the effects of ideologies in relationship to a control condition, to examine whether gender-blindness reduces, or gender-awareness increases, gender-STEM stereotypes. Finally, we examine whether the effects of blindness and awareness on stereotyping on STEM dimensions are specific to gender. To do so, we included race conditions (race-aware, race-blind, control), and race-related cultural stereotypes to support our theory that gender ideologies target stereotypes surrounding men and women's STEM skills and abilities, while race ideologies target positive, cultural stereotypes relevant to race.[2] Thus, the design of the study is 2 (race, gender) x 3 (aware, blind, control) between subjects.

7.1. Participants and procedures

A total of 412 outgroup participants (men in gender- and Whites in race- conditions) were recruited from Amazon's Mechanical Turk to take part in a two-part study on "Reflection on Current Issues" and "Attitudes and Evaluations." A total of twenty-eight participants were removed for either failing to recall the content of the manipulation or disagreeing with the premise of the article, and therefore not properly completing the exercise (although interaction effects and contrasts of interest remain significant without exclusion). In the gender condition,

[2] Out of secondary interest we also gave the study to 159 women ($M_{age} = 39.60$, $SD = 12.58$; 73% White) in the gender conditions; however, the experimental manipulations did not affect their STEM stereotyping ($M_{blind} = 0.34$, $SD = 0.49$; $M_{aware} = 0.28$, $SD = 0.59$; $M_{control} = 0.26$, $SD = 0.48$), $F(1, 155) = 0.34$, $p = .71$, $\eta_p^2 < 0.01$. Although men and women often endorse stereotypes similarly (Glick & Fiske, 2001), it has been shown that minority and majority groups react differently to diversity ideologies (Martin, 2018; Ryan et al., 2007). Thus, it is clear more research should be done to understand the effects of gender ideologies on women's self- and social-perception.

Table 2
Raw means and contrasts for Study 2.

Social category	Ideology	STEM		Agency		Communality		Competence		Race (Pos)	
		M	SD	M	SD	M	SD	M	SD	M	SD
Race	Awareness	0.19a	0.35	-0.09a	0.47	−0.15a	0.41	0.21a,b	0.37	0.59a	0.52
	Blindness	0.22a,b	0.54	-0.02a	0.48	−0.16a	0.40	0.25a,b	0.58	0.40b	0.44
	Control	0.39b,c	0.62	-0.06a	0.45	−0.25a	0.53	0.34a,b	0.60	0.55a,b	0.62
Gender	Awareness	0.51c	0.65	0.79b	0.67	0.68b	0.70	0.24a	0.52		
	Blindness	0.19a	0.51	0.57c	0.64	0.69b	0.68	0.21a,b	0.33		
	Control	0.40b,c	0.58	0.87b	0.76	0.92c	0.71	0.41b	0.56		

Subscripts that differ represent significant differences below $p < .053$.

a total of 179 men ($M_{age} = 35.75$, $SD = 11.01$; 68% White), and in the race condition a total of 205 Whites ($M_{age} = 38.94$, $SD = 12.75$; 53% men) completed the study. Following the procedure by Wolsko et al. (2000) participants were told we were interested in views of current issues on society and told that, we would like them to reflect on the current state of [gender] [race] relations in the United States. Participants received text espousing the importance of embracing versus downplaying gender versus race differences for achieving equality. Participants listed and selected a number of reasons these strategies could be successful. In the control conditions participants were asked to take a moment to reflect on the current state of gender versus race relations in the United States. See SOM for materials. They then moved on to "Attitudes and Evaluations" where they answered our race and gender related measures.

7.2. STEM stereotypes

To measure stereotyping, we asked participants, "to what extent *you* think that *in gener*al each trait is characteristic of the *average* [gender: man or woman] [race: White and Black person] in society", using the same scale as Study 1 (-2 = *much more characteristic of women [Blacks]* to 2 = *much more characteristic of men [Whites]*). We measured STEM stereotyping with three-items: good at math, good with numbers, and decisive ($\alpha = 0.73$).

7.3. Additional stereotypes

7.3.1. Gender stereotypes

To show that gender-ideologies affected STEM stereotyping above and beyond other forms of stereotyping, we measured gender stereotypes of *agency* (assertive, competitive, aggressive; $\alpha = 0.79$), *communality* (warm, sensitive, kind; $\alpha = 0.87$), and *competence* (competent, intelligent, capable; $\alpha = 0.78$) from Study 1. As in Study 1, communality items were reversed, such that higher scores represent greater stereotyping of females [Blacks] on communal traits.

7.3.2. Race stereotypes

Further, to show that ideologies affected specific race/gender stereotypes, we measured cultural stereotypes pertaining to African Americans (athletic, rhythmic, religious [$\alpha = 0.55$] Wolsko et al., 2000) in the race condition. Since these stereotypes are specific to race, they were only reliable ($\alpha_{gender} = 0.11$) and analyzed in the race conditions. Further, since we argue race ideologies are benevolent and aimed at achieving equality, we believed they would act upon positive, cultural stereotypes. However, we included several negative stereotypes (criminal, threatening, uneducated; $\alpha = 0.84$), which were unaffected by condition ($p = .72$). Race stereotypes were reversed such that higher scores represent greater stereotyping of African Americans.

7.4. Results

We analyze results using a 2 (social category: race vs. gender) × 3 (condition: aware vs. blind vs. control) MANOVA. We expect STEM stereotypes to be affected by gender ideologies, such that men in the blind condition will stereotype less than the aware or control conditions, and for these effects to be specific to gender (but not race) ideologies (i.e., no effects in race conditions). Further, while we predict other stereotypes may be affected by diversity ideologies, STEM stereotyping will persist despite any effects on other stereotypes.

7.5. Stereotypes

7.5.1. Gender stereotypes

Recall that we included a number of other gender-relevant stereotypes to show that the effects of gender-blindness on STEM stereotyping were robust, above and beyond other gender stereotypes. Thus we included all gender stereotypes (STEM, agency, communality, and competence) in a multivariate analysis of variance (MANOVA). We find a significant main effect of social category, $F(4, 375) = 72.42, p < .001$, *Wilks* $\lambda = 0.56$, $\eta_p^2 = 0.44$, and ideology condition, $F(8, 750) = 2.05$, $p = .039$, *Wilks* $\lambda = 0.96$, $\eta_p^2 = 0.021$; however these effects were qualified by a significant social category x ideology condition interaction, $F(8, 750) = 2.78$, $p = .005$, *Wilks* $\lambda = 0.94$, $\eta_p^2 = 0.029$. Examining each stereotype separately, we find a significant interaction of social category × ideology condition on STEM, $F(2, 378) = 3.31$, $p = .037$, $\eta_p^2 = 0.02$, agency, $F(2, 378) = 3.21$, $p = .04$, $\eta_p^2 = 0.017$, and communality, $F(2, 378) = 3.50$, $p = .031$, $\eta_p^2 = 0.018$, but not competence ($p = .68$) stereotypes. Given our focus on STEM, we report the effects of STEM stereotyping below, but comparisons between conditions for all stereotypes can be found in Table 2.

7.5.2. STEM stereotypes

We find a marginal effect of social category, $F(1, 378) = 2.94$, $p = .088$, $\eta_p^2 = 0.01$. Overall, individuals gender-stereotyped ($M = 0.38$, $SD = 0.59$) marginally more than they race-stereotyped ($M = 0.28$, $SD = 0.54$) STEM skills; though, it is notable that outgroup members believed that both men and Whites possessed more STEM skills than women and Blacks, respectively, where in both conditions stereotypes were endorsed significantly below the midpoint (p's < 0.01). Though there was a main effect of condition, $F(2, 378) = 3.78$, $p = .024$, $\eta_p^2 = 0.02$, this effect was qualified by a significant interaction, $F(2, 378) = 3.31$, $p = .037$, $\eta_p^2 = 0.02$.

In the race conditions, there was no significant difference between the aware and blind conditions ($p = .79$). Interestingly, compared to the experimental conditions those in the control condition believed that Blacks were significantly less competent in STEM abilities, compared to the aware, $F(1, 378) = 4.06$, $p = .045$, $\eta_p^2 = 0.01$, $CI_{95} = -0.38$, -0.01, and marginally less competent compared to the blind, $F(1, 378) = 3.10$, $p = .08$, $\eta_p^2 = 0.01$, $CI_{95} = -0.35$, 0.02, conditions. As expected, for gender, we find a significant effect between our ideological conditions of interest, $F(1, 378) = 8.75$, $p = .003$, $\eta_p^2 = 0.023$, $CI_{95} = 0.11$, 0.52, where men believed that women were more capable in STEM abilities in the gender-blind compared to the gender-aware conditions. Further, in line with our hypothesis about gender-awareness

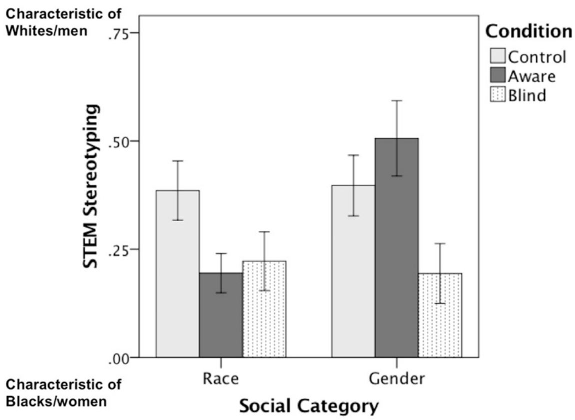

Fig. 2. STEM stereotype endorsement for Study 2.

being the baseline ideology (as in Study 1), we find that compared to the control condition, gender-blindness reduced stereotyping, $F(1, 378) = 4.07$, $p = .044$, $\eta_p^2 = 0.011$, $CI_{95} = 0.01, 0.40$, while the gender-aware condition did not differ from the control ($p = .28$). See Table 2 and Fig. 2.

7.6. Cultural, race stereotypes

Our second purpose for including additional stereotypes was to support our theory that unique stereotypes are affected by race and gender ideologies. To demonstrate this, we measured African American cultural stereotypes. For cultural, race stereotypes, though we do not find a significant overall effect of condition, $F(2, 202) = 2.24$, $p = .11$, $\eta_p^2 = 0.022$, in line with our theory about race-awareness highlighting positive stereotypes, we find that those in the blind condition stereotyped less than those in the aware, $F(1, 202) = 3.81$, $p = .05$, $\eta_p^2 = 0.02$, $CI_{95} = -0.38, 0.002$. The control condition did not differ from the blind ($p = .70$), and marginally differed from the aware condition, $F(1, 202) = 2.97$, $p = .086$, $\eta_p^2 = 0.015$, $CI_{95} = -0.33, 0.02$. See Table 2 for all contrasts.

7.7. Discussion Study 2

Study 2 demonstrated that using the very ideological prompts used by research on racial ideologies reifies traditional stereotyping that undermines women's careers in STEM. By doing so, Study 2 made several contributions. First, we show the specificity of gender-ideologies on men's STEM stereotyping. By showing that these ideologies did not affect STEM stereotyping of racial groups, and did not affect women's gender-STEM stereotyping (see Footnote 3), we show the relevance of gender ideologies for men's STEM stereotypes. Further, we show that above and beyond other gender stereotypes (agency, communality, and competence), gender ideologies had a strong and robust effect on STEM stereotyping. Although we continue to include these stereotypes in additional studies, we report them in SOM. Further, in line with past research, showing that race-awareness can sometimes exacerbate stereotyping (Gutiérrez & Unzueta, 2010; Wolsko et al., 2000), we replicate these effects, and show the specific nature of racial ideologies on positive cultural (but not other forms of) stereotyping. Much past research has not differentiated between positive and negative racial stereotyping (Ryan et al., 2007; Wolsko et al., 2000); given the positive nature of these ideologies, we corroborate theories which show that racial ideologies may act specifically on positive-racial stereotypes (Purdie-Vaughns & Walton, 2011; Zou & Cheryan, 2015). Finally, we show that ideologies can be manipulated, offering the potential to intervene on men's stereotyping of women.

8. Study 3: Gender-blind versus gender-aware on STEM stereotyping

In Study 3a and 3b, we use the same procedure to examine how messages we receive about gender ideologies in media can affect men's stereotypes about gender and STEM. In both studies, we use a 2 condition (gender-blind vs. gender-aware) design. In Study 3a, we collected as many participants as possible over the course of a semester, but ended with an underpowered sample; thus in Study 3b, we replicate this study and find consistent effects.

8.1. Study 3a

Forty men from a research pool at a large private university were recruited to take part in this study. We collected as many participants as possible over the course of a four-month period; however, due to the end of the semester and exhaustion of the participant pool, we were only able to collect 20 per cell. The sample was comprised of 55% White participants ($M_{age} = 23.40$; $SD = 3.90$).[3] Participants came into the lab for a study that was ostensibly about reading and memory in newspapers. Upon arrival, they were given a "randomly selected article," either receiving an article discussing the merits of gender-blindness or gender-awareness (used in Malicke, 2013; Martin & Phillips, 2017; see SOM). Participants answered several questions about the article and completed several scales.

8.1.1. STEM stereotypes

To capture stereotyping, we asked participants how much they thought STEM traits were characteristic of the average female (1 = *not at all* to 7 = *very much*). A separate set of questions asked participants how much they thought the same trait was characteristic of the average male (1 = *not at all* to 7 = *very much*). Question sets for male and female ratings were counter-balanced and traits within each set were randomized. Stereotype endorsement was measured by subtracting the average female score from average male score. We used the following STEM stereotypes: analytical, good with numbers, good at reasoning, and mathematical ($\alpha_{male} = 0.82$; $\alpha_{female} = 0.90$). Again, these stereotypes were embedded in an additional set of traits to both demonstrate the importance of STEM, as well as to curb demand effects. See SOM.

8.2. Results

We find a significant difference between condition on men's endorsement of STEM stereotyping, such that those in the aware condition ($M = 1.14$, $SD = 1.23$) stereotyped more than those in the blind condition ($M = 0.21$, $SD = 1.06$), $F(1, 38) = 6.50$, $p = .015$, $\eta_p^2 = 0.15$, $CI_{95} = 0.19, 1.67$. See Fig. 3a.

8.3. Study 3b

In Study 3b, we sought to replicate these effects. To do so, we recruited one hundred and three participants over a three-week period at a large, private, East-Coast University. Six women and 15 participants who "strongly disagreed" with the premise of the article (see pre-registration) were excluded from analysis. However, results are stronger and significant without excluding any participants ($p < .05$). This left a final sample of 82 men ($M_{age} = 26.44$; $SD = 11.08$; 52% White), 92% of whom were students. Participants followed the same procedure as Study 3a.

[3] We also included 55 women (29% White, $M_{age} = 23.13$, $SD = 6.92$) in our study. There was no difference between the blind ($M = -0.15$, $SD = 1.16$) and aware ($M = 0.01$, $SD = 0.99$) conditions on women's endorsement of gender-STEM stereotypes ($p = .59$).

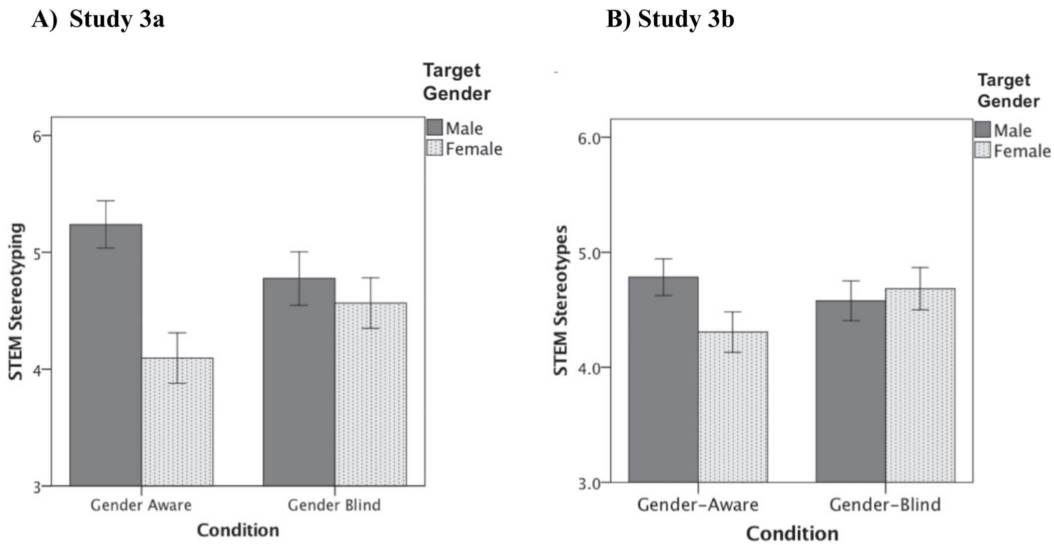

Fig. 3. Gender-Awareness versus gender-blindness on STEM Stereotyping in Study 3.

8.4. STEM stereotypes

We used the same stereotypes as Study 3a, where participants rated their endorsement of STEM stereotypes for the average female ($\alpha = 0.88$) and male ($\alpha = 0.85$). Again, question sets for male and female ratings were counter-balanced and traits within each set were randomized. Stereotype endorsement was measured by subtracting the average female score from average male score. Again, stereotypes were embedded in additional stereotypes and reported in SOM.

8.5. Results

We find a marginal effect of condition, $F(1, 80) = 3.70$, $p = .058$, $\eta_p^2 = 0.044$, $CI_{95} = -1.19, 0.02$, such that men in the gender-blind condition endorsed STEM stereotypes less ($M = -0.11$, $SD = 1.27$) than those in the gender-aware ($M = 0.48$, $SD = 1.44$) condition. See Fig. 3b.

8.6. Discussion Study 3

In Studies 3a and 3b, across two separate samples of male students ($N_{total} = 122$), we show a consistent effect that media messages advocating gender-blind versus gender-aware policies can change people's stereotypes about women's capabilities in STEM. In the next two studies, we move beyond broad stereotyping to examine whether gender-blind and gender-aware messages can affect men's views of female targets.

9. Study 4

In Study 4, we examine how gender ideologies affect evaluations of women's skills in STEM subjects. Further, we sought to extend these findings to examine the downstream consequences of STEM stereotyping, showing their importance for women's evaluations in concrete metrics around their future success (salary ambition).

9.1. Participants and procedures

Study 4 used a three condition (aware vs. blind vs. control) design. We collected 148 participants over a week-long recruitment period for a research lab at a large, private, East-Coast University. Participants were told that we were interested in 1) evaluating research interest and 2) social inference. A total of 20 participants were excluded from analysis who failed to identify the gender of the targets or content of the manipulation ($p = .05$ including all participants). The final sample was comprised of 128 men, 61% White ($M_{age} = 23.02$; $SD = 6.41$). Participants were first asked to evaluate an article espousing the merits of an awareness vs. blindness approach or a control article about “big data.” See SOM. Participants then moved on to the next part of the study, where they were told they would evaluate three of twelve (pseudo) student (target)s who came into the laboratory for a “different experiment.” They were given demographic information about Karen and Mark with a pseudo interview pretested transcript for each target, which was randomly assigned. Participants then completed questions related to stereotypes. See SOM for other measures and targets included to curb demand effects.

9.2. Dependent measures

9.2.1. STEM stereotypes

Participants were asked the extent to which they believed the following traits (analytical, good at reasoning, logical, mathematical) described Karen ($\alpha = 0.61$) and Mark ($\alpha = 0.75$), presented in random order, on a scale from 1 = *not at all* – 7 = *very much*.

9.2.2. Salary ambition

Additionally, as an exploratory additional measure, we included a concrete measure of potential future achievement (salary ambition). To measure this we asked, “how much do you think [Target] said he/she will be earning 5 years from now?” on a scale from 1 = *less than $15,000* to 10 = *more than $300,000*. Notably, to capture general competence, we also measured perceptions of the target's GPA and found no differences (p's > 0.19) between any conditions (see SOM).

9.3. Results

For ease of presentation, we present a difference score between Mark and Karen, but raw means can be found in Table 3. For STEM-stereotypes we find an effect of ideological condition on STEM stereotyping, $F(2, 125) = 5.32$, $p = .006$, $\eta_p^2 = 0.079$. Those who read the gender-aware article ($M = 0.86$, $SD = 1.32$) rated Karen relatively lower on STEM-stereotypes, compared to both the gender-blind ($M = 0.04$, $SD = 1.36$), $F(1, 125) = 10.20$, $p = .002$, $\eta_p^2 = 0.075$, $CI_{95} = 0.31, 1.33$, and those in the control condition ($M = 0.26$, $SD = 0.91$), $F(1, 125) = 4.65$, $p = .033$, $\eta_p^2 = 0.036$, $CI_{95} = 0.05, 1.15$. Unlike Study 2, the control and blind conditions were not significantly

Table 3
Raw means and contrasts for Study 4.

Ideological condition and target	STEM stereotypes			D-Score two-tailed *t*-test from 0		Future income			D-score two-tailed t-test from 0	
	M	SD	M-F Diff	t	p	M	SD	M-F Diff	t	p
Gender-aware										
Man	5.11	0.94	0.86	4.44	< 0.001	6.67	1.19	0.63	3.15	0.003
Woman	4.24	0.92				6.04	0.97			
Gender-blind										
Man	4.61	1.05	0.04	0.21	0.83	6.3	1.14	0.02	0.11	0.92
Woman	4.56	0.86				6.28	1.31			
Control										
Man	4.74	0.88	0.26	1.71	0.096	6.31	0.99	0.22	0.94	0.35
Woman	4.48	0.93				6.09	1.1			

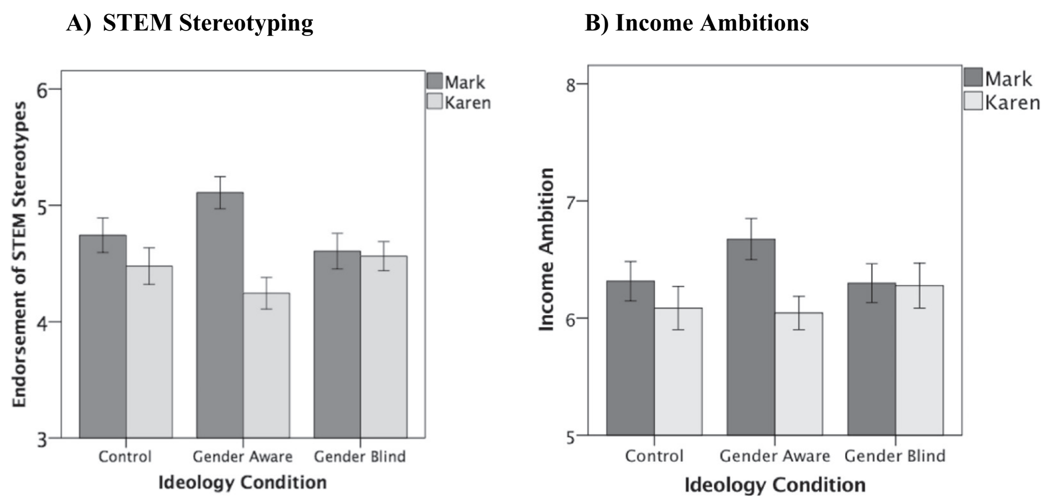

Fig. 4. Gender-awareness versus gender-blindness on STEM stereotyping and income ambitions in Study 4.

different from one another ($p = .43$), but notably in both the aware and control conditions, participants believed that men possessed more STEM skills than did women (p's < 0.10); however, in the gender-blind condition, there was no difference between evaluations of men and women's STEM skills. See Table 3 and Fig. 4a.

For our salary ambition measure, though the overall effect of the three conditions was not significant overall, $F(2, 125) = 2.31$, $p = .10$, $\eta_p^2 = 0.036$, the contrast of interest between the aware ($M = 0.63$, $SD = 1.36$) and blind ($M = 0.02$, $SD = 1.38$) conditions was significant, $F(1, 125) = 4.50$, $p = .036$, $\eta_p^2 = 0.035$, $CI_{95} = 0.04, 1.18$. The control condition ($M = 0.23$, $SD = 1.44$), fell between the two, not being different from the aware ($p = .50$) or blind ($p = .20$) conditions (see Fig. 4b). Further, as an exploratory analysis, we examined whether the lesser STEM stereotyping found in the gender-blind, compared to gender-aware, conditions mediated the effect on future income. To do so, we used PROCESS Model 4 (Preacher & Hayes, 2004, 2008) to examine the indirect effect of condition (1 = aware, 2 = blind) on our occupational success through STEM stereotyping. We find the indirect effect between condition on salary ambition through STEM stereotyping is significant (*indirect effect* $= -0.37$, $SE = 0.15$, $CI_{95} = -0.68, -0.09$), while the direct effect of condition on salary ambition becomes non-significant ($p = .38$, $CI_{95} = -0.77, 0.29$). In other words, lesser stereotyping in the blind, compared to aware, condition accounted for a significant portion of variance in the relationship between gender-blindness and predicted salary ambition.

9.4. Discussion Study 4

In Study 4 we show that manipulating gender-blind and gender-aware ideologies can have effects on the ways in which men view women's competencies on STEM dimensions. By using target evaluations, we show that men who were primed with gender-blindness believed women were more capable of STEM skills than their gender-aware counterparts. Unlike Study 2, we did not find that gender-blindness significantly reduced stereotyping, but rather that gender-awareness increased it. We meta-analyze these effects after Study 5 to glean more information about movement from the control condition across studies; however, since both gender ideologies are espoused as strategies to promote gender-equality, it is important to note the effects of these proposed interventions relative to each other. Further, we find a significant and marginal difference between male-female ratings in the aware and control conditions, respectively, where men rated the male target as more competent in STEM compared to the female target. In contrast, we found no difference between the male-female ratings in the gender-blind condition. That is, in the blind condition, men did not rate the male target as more competent in STEM, compared to the female target. Finally we explored the effects on occupational success measures to show that gender ideologies and STEM stereotyping both have implications for the rating of women's perceived achievement aspirations and ambition.

10. Study 5

One concern that has been expressed about ideology manipulations is the possibility that they might suffer from demand characteristics. In previous studies we used established methods to measure these demand characteristics and found no support for this argument; however in Study 5, we use a more subtle manipulation, devoid of the mention of gender, altogether. To do so, we used the minimal group paradigm (see Brewer, 1991; Tajfel, Billig, Bundy, & Flament, 1971), previously shown to exacerbate perceptions of gender differences, without making gender salient (Prentice & Miller, 2006). This task is meant to create a meaningless and arbitrary distinction between groups, which trigger tendencies for in-group favoritism and stereotyping (Brewer, 1991; Prentice & Miller, 2006; Tajfel et al., 1971). Specific to gender, Prentice and Miller (2006) theorized that since gender is the most essentialized category, arbitrary distinctions on a perceptual style task between a single male and female would lead participants to attribute these distinctions to gender. In several studies, they demonstrated that when men and women differed in their tendency to "over-estimate" or "under-estimate," participants generalized these differences to gender and did not adjust their estimates in subsequent rounds of the task.

Based on these findings, we used this *perceptual style minimal group paradigm* in the current study. Using this paradigm, we aim to show that men paired with a female partner of a different perceptual style, who are told to embrace differences, will attribute perceptual-style differences to gender, and rate their partner as less competent on STEM dimensions, compared to men who are paired with a partner of a similar perceptual style, and told to embrace similarities. Further, we aim to show that this effect is specific to ratings of women, by including a condition with men as the target; however, we do not expect perceptual styles to be attributed to gender competencies when men are paired with a male partner, and therefore, do not expect differences in STEM stereotyping of their male partner. Finally, we examined how blind and aware messages would affect men's assignment of STEM problems to a female partner, as STEM stereotypes affect perceptions of women's STEM abilities and ambitions, and therefore could have downstream consequences for men's cooperation with, and trust in, a female partner in this domain. Thus, we use a 2 (ideology: blind vs. aware) × 2 (partner: female vs. male) design.

10.1. Participants and procedure

Two hundred and thirty-three male participants were recruited from Amazon's Mechanical Turk to take part in a study on "Perceptual Style and Performance." Twenty-four participants were removed for failing an attention check and/or failing to remember their partner's gender. However, including these participants does not change results. The final sample consisted of 209 males (70% White; $M_{age} = 33.27$, $SD = 9.24$).

Participants were told that, we were interested in perceptual style and its correlates. They were told that they would first engage in a perceptual style test, to determine their perceptual style, and then would be paired with a partner to complete a task. As in the *perceptual style minimal group paradigm task* (Brewer, 1991; Prentice & Miller, 2006) participants were first shown 10-slides with a number of different colored dots, each for 3 s, and asked to guess whether there were more or less blue dots. After doing this task, they were told they were either an over-estimator or an under-estimator (controlling for this factor does not affect results).

On the next page, they received the "ideology" manipulation, taken from our previous manipulations, but this time devoid of gender. For example, in the aware condition, they read that, "research suggests that we should embrace differences between people… different people bring different backgrounds, which provides a richness in viewpoints and problem-solving strategies. Since you are an [over-] [under-] estimator you will be paired with an [under-] [over-] estimator for the next task." In the blind condition, they read that, "research suggests that we should downplay differences and embrace similarities. By de-emphasizing differences and focusing on similarities, individuals build a sense of unity and interact more cooperatively. Since you are an [over-] [under-] estimator you will be paired with another [over-] [under-] estimator for the next task." Full materials available in SOM.

After entering a screen-name, they were given their partners name, which was either a male (Mark; David; John; Michael; James) or female (Karen; Ashley; Jenn; Kim; Sarah) name. They were told that they would divide and complete a math task, where they would solve 15 math problems in 2-min and receive $0.05 for each question they answered correctly. We chose a math domain to make salient the STEM skills required for this task. They were given instructions and example questions. They were then asked to answer questions (our dependent variables of interest) about their partner, before beginning.

10.2. Dependent variables

To accurately examine participants' ratings of their partner's competencies, we took a difference score between other- and self- ratings on stereotypical dimensions, as participants' perceptions of their partner's competencies are relative to how competent they believe they, themselves, are on these dimensions.

10.3. STEM stereotypes

Participants were asked to rate how well a series of adjectives describes 1) YOU and 2) YOUR PARTNER on a scale from 1 = *does not describe me at all* to 7 = *describes me very well.* To measure STEM stereotypes, we used the following traits: analytical mathematical, good at reasoning, good at problem-solving ($\alpha = 0.76$), taking a difference score between self-partner ratings to examine ratings of their partner's STEM abilities (see raw means in Table 4). As in past studies these stereotypes were embedded in others (see SOM).

10.3.1. Math problems assigned

To examine whether "aware" vs. "blind" messages would affect participants' confidence in performance, we told participants that they would decide how many problems they would do themselves, and how many problems their partner would do. They were asked to, "indicate how many math problems you would like your partner to do." Answers range from 0 (none) to 15 (all).

10.4. Results

10.4.1. STEM stereotypes

We find no effect of ideology condition or partner gender (p's > 0.28); however, as expected we find a significant ideology × partner gender interaction, $F(1, 205) = 5.17$, $p = .024$, $\eta_p^2 = 0.025$. For men partnered with another male, we find no differences in their relative

Table 4
Raw means and contrasts for Study 5.

Ideological condition and partner gender	STEM stereotypes				D-score two-tailed t-test from 0			Math problems assigned				D-Score two-tailed t-test from 0		
	Self	SD	Partner	SD	S-P Diff	t	p	Self	SD	Partner	SD	S-P Diff	t	p
Gender-aware														
Male partner	4.76	1.29	4.82	1.18	−0.07	−0.30	0.74	8.26	2.56	6.75	2.56	1.51	2.03	0.05
Female partner	5.06	1.15	4.69	1.07	0.38	2.53	0.01	7.93	3.87	7.07	3.87	0.85	0.81	0.42
Gender-blind														
Male partner	4.79	1.07	4.65	0.99	0.15	0.74	0.47	8.50	3.32	6.50	3.32	2.00	2.25	0.03
Female partner	4.50	1.11	4.73	0.87	−0.23	−1.4	0.16	7.68	3.33	7.32	3.33	0.37	0.4	0.69

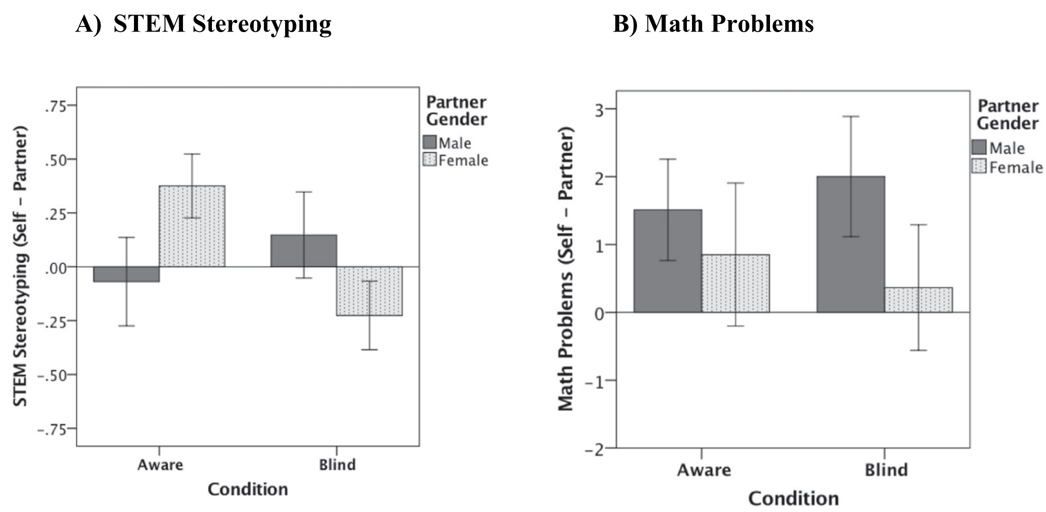

Fig. 5. Awareness versus blindness on stereotyping and math problems in Study 5.

partner STEM-ratings in the aware ($M = 0.07$, $SD = 1.41$) or blind ($M = -0.15$, $SD = 1.50$) condition, $F(1, 205) = 0.71$, $p = .40$, $\eta_p^2 = 0.003$, $CI_{95} = -0.29$, 0.72. For men partnered with a female, we find that those in the aware ($M = -0.38$, $SD = 1.09$) condition rated their partner as significantly less competent in STEM compared to those in the blind ($M = 0.23$, $SD = 1.15$) condition, $F(1, 205) = 5.69$, $p = .018$, $\eta_p^2 = 0.027$, $CI_{95} = -1.10$, -0.10. See Table 4 and Fig. 5a.

10.5. Math problems assigned

We find no effect of ideology condition or partner gender (p's > 0.22), and no significant ideology × partner gender interaction, $F(1, 205) = 0.28$, $p = .60$, $\eta_p^2 = 0.001$. That is, across conditions, there were no effects of our ideological manipulation on how many math problems the male participants assigned to a male partner ($M_{aware} = 6.75$, $SD = 2.56$; $M_{blind} = 6.50$, $SD = 3.32$) as opposed to a female partner ($M_{aware} = 7.07$, $SD = 3.87$; $M_{blind} = 7.32$, $SD = 3.33$). See Fig. 5b.

10.6. Indirect effects of stereotyping on math assignments

Though there was no main effect of task assignment to a female partner as a function of condition, recall that we predicted effects on math problems assigned to operate through STEM stereotyping and that non-significant paths do not preclude testing for an indirect effect (Hayes, 2009; Rucker, Preacher, Tormala, & Petty, 2011), which we examine next. Specifically, since we believed the effect of diversity ideology was specific to women, we believed we would find a moderated mediation, whereby the indirect path between ideology condition (IV) on task assignment (DV) would be mediated through STEM stereotyping (Med), but that this effect would only occur when men were assigned a female partner (Mod). To test this hypothesis, we ran a moderated mediation (using PROCESS model 8), using an indirect effect of the highest-order product term to infer whether the moderation is mediated (Hayes, 2013). Indeed, we find a significant highest-order product term for our moderated mediation, *indirect effect* = 0.76, $SE = 0.35$, $CI_{95} = 0.09$, 1.47. Specifically, at the value of "male-partner," there was no significant effect of condition on math tasks assigned through STEM stereotyping, *indirect effect* = −0.20, $SE = 0.27$, $CI_{95} = -0.74$, 0.34; however, as expected, there was a significant indirect effect at the value of "female-partner," *indirect effect* = 0.56, $SE = 0.35$, $CI_{95} = 0.16$, 1.00.

Thus, although an indirect effect does not allow us to conclude that gender-blind versus gender-aware ideologies will change how many math problems men assign to a female partner, it does suggest that the very STEM stereotypes affected by gender ideologies have a meaningful influence on the amount of work men assign to women in STEM domains.

10.7. Discussion Study 5

In Study 5, we find that "aware" and "blind" strategies can have effects on perceptions of women's STEM competencies even when the ideology manipulation was directed, not towards gender, but towards the minimal distinction of under- and over-estimation. That is, since gender is such a salient category, solely telling men to embrace or downplay (non-gender) differences between themselves and a female partner can heighten gender stereotypes, specifically around STEM. Further, though these subtle ideologies did not have direct effects on the number of math problems assigned men assigned to a male or female partner, we do find an indirect effect, such that these ideologies can heighten STEM stereotyping, and that the more individuals positively stereotype on STEM dimensions, the more math-tasks they assign to their partner. Gender ideologies did not affect men's direct assignment of tasks to women, however it is plausible that it affected perceptions of their competencies or performance on the problems they did assign. In any case, STEM stereotyping is a key variable in competencies and opportunities for women in STEM (Reuben, Sapienza, & Zingales, 2014). These findings are problematic as many (if not most) companies espouse the benefits of "embracing [all] diversity." However, we find that when men are told to "embrace differences" they are more likely to assume that these differences are driven by gender, which exacerbates stereotypes about women, ultimately undermining their potential. Thus, the many messages we receive about "embracing diversity" can actually jeopardize the very diversity these approaches aim to achieve.

10.8. Internal meta-analysis across studies

Given the apparent heterogeneity in the effect size across studies, we conducted an internal meta-analysis of studies that directly compared and contrasted gender awareness (versus blindness) on stereotyping, following the procedures outlined in Rosenthal (1991) and Goh, Hall, and Rosenthal (2016), for combining and comparing effect sizes. See Fig. 6 for plots. We find a robust effect, whereby gender-blindness led to less stereotyping, compared to awareness, $r = -0.25$, $p < .001$, $CI_{95} = -0.32$, -0.18. Further, though we did not find consistent effects of control condition comparisons, across studies, we find that gender-blindness seems to reduce, $r = -0.15$, $p < .05$, $CI_{95} = -0.28$, -0.01 while awareness seems to increase, $r = 0.15$, $p < .05$, $CI_{95} = 0.02$, 0.29, gender-STEM stereotyping, overall. See Fig. 6.

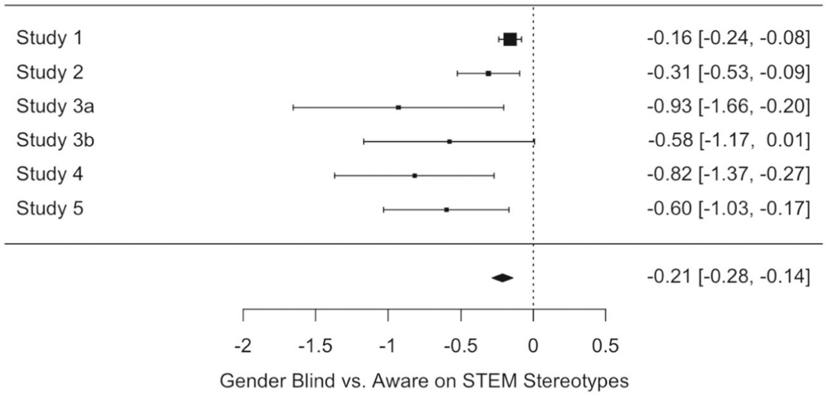

Fig. 6. Forest plots for effects across studies.

11. General discussion

Across six studies, we find that gender-blindness both relates to (Study 1) and leads to (Studies 2–5) less gender stereotyping on STEM dimensions, compared to gender-awareness. Both in overall stereotyping and specific target ratings, we find that gender ideologies have the potential to either exacerbate or reduce gender stereotyping. Further, theoretically differentiating gender from race ideologies, we find that awareness and blindness ideologies specifically target, gender-role stereotypes involving skills and abilities, rather than the cultural stereotypes evoked when Whites endorse or are primed with awareness ideologies. Across studies, we find consistent and robust effects for the potential for gender-blindness, and the risk of gender-awareness, to diminish and exacerbate stereotypes, respectively. In doing so, we make several theoretical and empirical contributions.

11.1. Practical contributions for women in STEM

STEM-stereotyping represents a significant barrier to women's inclusion in domains of power (NACE, 2016). As such, many scholars and practitioners are seeking interventions to reduce biases against, and increase efficacy of, women (see Cheryan et al., 2015). Here we offer gender-blindness as an intervention to reduce gender-stereotyping, not only from levels of "gender-awareness," but from baseline levels (see meta-analysis). Indeed, this research suggests that highlighting or overemphasizing the already salient beliefs about men and women's STEM related differences leads men to stereotype women even more, and has the potential to exacerbate bias and undermine women's confidence at work (Martin & Phillips, 2017). Given that many books, scholars, and practitioners advocate for increasing awareness of women's "unique qualities," (Annis & Merron, 2014) it seems as though doing so, can backfire and be detrimental to women in STEM, as these differences seem to revolve around men and women's perceived differences in capabilities. Indeed, it seems as though *using no strategy* may be more effective than gender-awareness (also see meta-analysis). Given that very few gender differences that occur across contexts and time (see Hyde, 2005), and most gender differences occur when gender is made salient or situations are ambiguous (Bowles, Babcock, & McGinn, 2005), highlighting gender differences may actually be creating "gender triggers" which can limit access and opportunity to a woman in spite of her potential to succeed in these domains.

Further, though changing STEM stereotypes about computer scientists, to include more female qualities (such as communality; Diekman et al., 2011; Cheryan, Plaut, Handron, & Hudson, 2013), can increase *women's interest* in STEM, these findings suggest that such strategies may not be sufficient to reduce *men's bias* towards women in STEM. Thus, more research is needed to understand effective interventions which increase women's interest and reduce men's bias in STEM, reconciling these findings across paradigms and bodies of research.

11.2. Empirical contributions for diversity ideologies

Further, this paper makes a number of contributions for furthering our understanding of diversity ideologies. First, we show that unlike the effects of awareness ideologies on race stereotyping, highlighting the differences between men and women has different effects, whereby awareness and blindness ideologies seem to highlight and suppress unique types of differences. Indeed, we replicate past work which shows that compared to blindness, race-awareness increases (positive) cultural stereotypes, rather than gender-role STEM stereotyping. Problematically, we find that Blacks are seen as significantly less competent in STEM, compared to Whites (See Study 2); thus, it is not that these problematic and pernicious stereotypes do not affect African Americans, it just does not seem as though race ideologies are an effective way to diminish these perceptions. Future research is needed to understand how to improve expectations about African American's competencies in STEM. However, by distinguishing the unique stereotypes highlighted and downplayed through awareness and blindness diversity ideologies, we demonstrate the importance of understanding the distinct effects of these strategies for different social groups and warn against holistic approaches to diversity.

Further, unlike past work on diversity ideologies, we provide a novel intervention to manipulate gender awareness and blindness ideologies, devoid of the mention of gender (see Study 5). Given that gender is one of the most salient social categories evoked when people perceive difference (Prentice & Miller, 2006), by telling individuals to embrace or downplay "differences," regardless of what those might be, we may be inadvertently highlighting gender inequality. Notably, this task was related to perceptual style, which is specifically salient for gender. Thus, future research is needed to understand which types of differences being highlighted or downplayed also affect gender.

11.3. Limitations and directions for future research

11.3.1. Benefits and dangers of gender-blindness

It is important to note *why* gender-blindness may be more effective than gender-awareness and to interpret and apply these results with caution, as both blindness and awareness ideologies have the potential to backfire. We do not suggest gender-blindness as a panacea or holistic solution; we suggest that gender-blindness has the potential to downplay STEM stereotypes, which are traditionally seen as masculine. As with race-awareness which can also lead to unintended negative consequences (Hahn et al., 2015; Zou & Cheryan, 2015), we believe gender-blindness can similarly backfire in certain contexts and domains. For example, gender-blindness may downplay the systemic inequality women face in a number of domains or devalue the more "feminine" STEM skills that are useful to the field (e.g., creativity; imaginativeness; Diekman & Eagly, 2000). While we tested these possibilities in Study 1, we also caution against extending the strategy beyond the scope of this paper, as more research is needed to fully understand the consequences of gender-blindness.

Further, the technology industry is seen as one of the most hostile towards women (Hewlett, Luce, & Servon, 2008). Clearly, gender-blindness is not solely the solution for women in technology. A significant change in the technology industry is needed to make the culture more inclusive for everyone, not just women. However, reducing stereotypes around STEM-competencies may give women more opportunities in these fields to change expectancies and organizational culture. Further, there is risk that for women who strongly identify with femininity, gender-blindness may exacerbate backlash by creating expectancies that women “act like men” or pigeon-hole women into solely using analytical and problem-solving skills, rather than bringing a broad array of abilities to the table. Thus, this strategy should be implemented carefully and more research is needed to understand the full scope of these effects.

11.3.2. The contextualized effects of gender-blindness

Additionally, these results applied to explicit STEM stereotyping and female evaluations, devoid of emotional and cognitive demands; it is unclear whether they would occur in contexts of conflict or in times of cognitive depletion. For example, though race-awareness seems to be effective overall, when tested in times of conflict, colorblindness reduces momentary bias and prejudice via suppression (Correll, Park, & Smith, 2008). Thus, it is important for research to examine the contextual effects of these ideologies in times of conflict, cognitive depletion, or other, more complicated, intergroup situations. Further, more recently several scholars (see Gündemir, Homan, Usova, & Galinsky, 2017; Hahn et al., 2015) have developed more nuanced conceptualizations of diversity ideologies, which may have different effects on men's STEM stereotyping of women.

While we found robust and consistent effects of gender-blindness and -awareness on explicit stereotypes and bias, we did not find consistent effects for implicit associations. Explicit and implicit associations often have different consequences, with explicit bias being more powerful when cognitive resources are sufficient (Dovidio et al., 2002) and affect more deliberate bias, rather than subtle and indirect forms of bias (Dovidio et al., 2002; Fazio et al., 1995). Thus, while we demonstrate the potential for diversity ideologies to change the ways in which men *apply* stereotypes, future research is needed to change the strong and entrenched *associations* between women and STEM to combat the effects of stereotypes from many angles.

Additionally, we did not find consistent evidence that gender-blind and gender-aware ideologies affected *women's* STEM stereotyping. Since women also hold gender bias (Glick & Fiske, 2001), it is important for future research to examine why these effects did not occur for women and how to reduce women's gender bias in STEM.

Finally, women (and men) are not monolithic groups and thus, more research is needed to understand the effects of these diversity ideologies, as stereotypes might intersect and differently affect women who are not seen as exemplars of the gender category, such as Black, older, or homosexual women (see Livingston, Rosette, & Washington, 2012; Martin, North, & Phillips, 2018). Though controlling for other demographic variables in each study, these effects hold (see SOM), future research is needed to understand how gender ideologies affect intersectional social group, gender subtypes, and women's self-perceptions in STEM.

12. Conclusion

Increasing women's representation in STEM has received much focus, especially amongst technology companies. Despite their efforts, progress has stagnated and many companies express confusion and frustration over why their diversity policies have not worked. Here we suggest that rather than advocating the “business value” of women in STEM, based on the unique skills they bring to the table, we should instead focus on their similar competencies in STEM skills to decrease bias towards, and increase opportunities for, women in STEM.

Open practices

The experiments in this article earned Open Materials and Preregistration badges for transparent practices. Materials and stimuli for experiments, as well as supplemental online material, are available at https://osf.io/8mtdu.

Appendix A. Supplementary materials

Supplementary materials to this article can be found online at https://doi.org/10.1016/j.jesp.2018.11.003.

References

American Bar Association (2014). JD and LLB Degrees Awarded, 1981–2011. Retrieved from: http://www.americanbar.org/content/dam/aba/administrative/legal_education_and_admissions_to_the_bar/statistics/jd_llb_degrees_awarded.authcheckdam.pdf.

Annis, B., & Merron, K. (2014). *Gender intelligence: Breakthrough strategies for increasing diversity and improving your bottom line.* New York: Harper Business.

Apfelbaum, E., Pauker, K., Ambady, N., Sommers, S., & Norton, M. (2008). Learning (not) to talk about race: When older children underperform in social categorization. *Developmental Psychology, 44*(5), 1513.

Associated Press (2018). *7 striking facts about the money tech companies are making.* WTOP. Retrieved from: https://wtop.com/tech/2018/04/7-striking-facts-about-the-money-tech-companies-are-making/.

Baron-Cohen, S. (2003). *The essential difference: Male and female brains and the truth about autism.* New York: Basic Books.

Bonilla-Silva, E. (2003). *Racism without racists.* Lanham, MD: Rowman & Littlefield.

Bowles, H., Babcock, L., & McGinn, K. (2005). Constraints and triggers: Situational mechanics of gender in negotiation. *Journal of Personality and Social Psychology, 89*(6), 951–965.

Brewer, M. B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin, 17*(5), 475–482.

Cheryan, S., Master, A., & Meltzoff, A. (2015). Cultural stereotypes as gatekeepers: Increasing girls' interest in computer science and engineering by diversifying stereotypes. *Frontiers in Psychology, 6*, 1–8.

Cheryan, S., Plaut, V., Davies, P., & Steele, C. (2009). Ambient belonging: How stereotypical cues impact gender participation in computer science. *Journal of Personality and Social Psychology, 97*(6), 1045–1060.

Cheryan, S., Plaut, V., Handron, C., & Hudson, L. (2013). The stereotypical computer scientist: Gendered media representations as a barrier to inclusion for women. *Sex Roles, 69*(2), 58–71.

Cheryan, S., & Plaut, V. C. (2010). Explaining underrepresentation: A theory of precluded interest. *Sex Roles, 63*(7–8), 475–488.

Correll, J., Park, B., & Smith, A. (2008). Colorblind and multicultural prejudice reduction strategies in high-conflict situations. *Group Processes and Intergroup Relations, 11*, 471–491.

Damore, J. (July 2017). Google's ideological echo chamber: How bias clouds our thinking about diversity and inclusion. Retrieved from: https://assets.documentcloud.org/documents/3914586/Googles-Ideological-Echo-Chamber.pdf.

Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*(1), 5–18.

Diekman, A. B., Clark, E. K., Johnston, A. M., Brown, E. R., & Steinberg, M. (2011). Malleability in communal goals and beliefs influences attraction to STEM careers: Evidence for a goal congruity perspective. *Journal of Personality and Social Psychology, 101*, 902–918.

Diekman, A. B., & Eagly, A. H. (2000). Stereotypes as dynamic constructs: Women and men of the past, present, and future. *Personality and Social Psychology Bulletin, 26*, 1171–1188.

Dovidio, J. F., Gaertner, S. L., & Kawakami, K. (2003). Intergroup contact: The past, present, and the future. *Group Processes & Intergroup Relations, 6*(1), 5–21.

Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2000). Reducing contemporary prejudice: Combating explicit and implicit bias at the individual and intergroup level. *Reducing Prejudice and Discrimination,* 137–163.

Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2002). Implicit and explicit prejudice and interracial interaction. *Journal of Personality and Social Psychology, 82*(1), 62–68.

Eagly, A. (2013). *Sex differences in social behavior: A social-role interpretation.* Psychology Press.

Eagly, A. H. (1997). Sex differences in social behavior: Comparing social role theory and evolutionary psychology. *American Psychologist, 50*, 1380–1383.

Fazio, R. H., Jackson, J. R., Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology, 69*(6), 1013–1027.

Fraley, R., & Marks, M. (2007). The null hypothesis significance testing debate and its implications for personality research. In R. Robins, R. Fraley, & R. Krueger (Eds.). *Handbook of research methods in personality psychology* (pp. 149–169). New York, NY:

Guilford Press.
Galinsky, A. D., Todd, A. R., Homan, A. C., Phillips, K. W., Apfelbaum, E. P., Sasaki, S., ... Maddux, W. W. (2015). Maximizing the gains and minimizing the pains of diversity: A policy perspective. *Perspectives on Psychological Science, 10*, 742–748.
Glick, P., & Fiske, S. (2001). An ambivalent alliance: Hostile and benevolent sexism as complementary justifications for gender inequality. *American Psychologist, 56*(2), 109–118.
Goh, J., Hall, J., & Rosenthal, R. (2016). Mini meta-analysis of your own studies: Some arguments on why and a primer on how. *Social and Personality Psychology Compass, 10*, 535–549.
Gündemir, S., Homan, A., Usova, A., & Galinsky, A. (2017). Multicultural meritocracy: The synergistic benefits of valuing diversity and merit. *Journal of Experimental Social Psychology, 73*, 34–41.
Gurian, A., & Annis, B. (2008). *Leadership and the sexes: Using gender science to create success in business.* San Francisco: A Wiley imprint.
Gutiérrez, A. S., & Unzueta, M. M. (2010). The effect of interethnic ideologies on the likability of stereotypic vs. counterstereotypic minority targets. *Journal of Experimental Social Psychology, 46*(5), 775–784.
Hahn, A., Banchefsky, S. M., Park, B., & Judd, C. M. (2015). Measuring inter-group ideologies: Positive and negative aspects of emphasizing versus looking beyond group differences. *Personality and Social Psychology Bulletin, 41*(12), 1646–1664.
Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*, 408–420.
Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.* New York, NY: Guilford Press.
He, J., van de Vijver, F. J., Dominguez Espinosa, A., Abubakar, A., Dimitrova, R., Adams, B. G., ... Fischer, R. (2015). Socially desirable responding: Enhancement and denial in 20 countries. *Cross-Cultural Research, 49*(3), 227–249.
Heilman, M. E. (2001). Description and prescription: How gender stereotypes prevent women's ascent up the organizational ladder. *Journal of Social Issues, 57*(4), 657–674.
Hewlett, S. A., Luce, C. B., & Servon, L. J. (2008). Stopping the exodus of women in science. *Harvard Business Review, 86*(6), 22–24.
Hugenberg, K., & Bodenhausen, G. V. (2003). Facing prejudice: Implicit prejudice and the perception of facial threat. *Psychological Science, 14*(6), 640–643.
Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist, 60*(6), 581–592.
Knowles, E., Lowery, B., Hogan, C., & Chow, R. (2009). On the malleability of ideology: Motivated construals of colorblindness. *Journal of Personality and Social Psychology, 96*, 857–869.
Koenig, A., & Eagly, A. H. (2014). Evidence for the social role theory of stereotype content: Observations of groups' roles shape stereotypes. *Journal of Personality and Social Psychology, 107*(3), 371–392.
Koenig, A., & Richeson, J. (2010a). The contextual endorsement of sexblind versus sexaware ideologies. *Social Psychology, 41*(3), 186–191.
Koenig, A., & Richeson, J. (2010b). The contextual endorsement of sexblind versus sexaware ideologies. *Social Psychology, 41*(3), 186–191.
Lai, C. K., Marini, M., Lehr, S. A., Cerruti, C., Shin, J. E. L., Joy-Gaba, J. A., ... Frazier, R. S. (2014). Reducing implicit racial preferences: I. a comparative investigation of 17 interventions. *Journal of Experimental Psychology: General, 143*(4), 1765.
Livingston, R. W., Rosette, A. S., & Washington, E. F. (2012). Can an agentic black woman get ahead? The impact of race and interpersonal dominance on perceptions of female leaders. *Psychological Science, 23*(4), 354–358.
Malicke, J. (2013). *Gender ideology and evaluations of a male versus female target: Effects of emphasizing versus downplaying gender differences.* Unpublished masters thesisUniversity of Colorado Boulder.
Markus, H. R., Steele, C. M., & Steele, D. M. (2000). Colorblindness as a barrier to inclusion: Assimilation and nonimmigrant minorities. *Daedalus, 129*, 233–259.
Martin, A. E., North, M. N., & Phillips, K. W. (2018). Intersectional escape: Older women elude agentic prescriptions more than older men. *Personality and Social Psychology Bulletin*. https://doi.org/10.1177/0146167218784895 (Advance online publication).
Martin, A. E. (2018). *The divergent effects of diversity ideologies for race and gender relations (No. 10789688).* Available from ProQuest Dissertations & Theses Global (2034426489).
Martin, A. E., & Phillips, K. W. (2017). What blindness helps women see and do: Implications of gender blindness for confidence, agency and action. *Organizational Behavior and Human Decision Processes*. *142. Organizational Behavior and Human Decision Processes* (pp. 28–44).
Martin, A. E., Phillips, K. W., & Sasaki, S. J. (2016). *The benefits of gender-blindness for men's bias towards and inclusion of women* https://doi.org/10.5465/AMBPP.2016.14581.
Moran, G. (2015). Women now make up 40% of students at top MBA programs. Fortune (November 9). Retrieved from: http://fortune.com/2015/11/09/women-mba-40-percent/.
NACE (2016). *Starting salaries for new college graduates: Executive summary.* National Association of Colleges and Employers. Retrieved from: www.naceweb.org.
National Science Foundation (2013). *TABLE 5-2. bachelor's degrees awarded, by field and sex.* 2002–2012. Available at: http://www.nsf.gov/statistics/wmpd/2013/pdf/tab5-2_updated_2014_05.pdf.
Nosek, B., Smyth, F., Sriram, N., Linder, N., Devos, T., Ayala, A., ... Greenwald, A. (2009). National differences in gender-science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academy of Sciences, 106*, 10593–10597.
Ovide, S., & Molla, R. (2016). Technology conquers stock market. *Bloomberg*. Retrieved from: https://www.bloomberg.com/gadfly/articles/2016-08-02/tech-giants-form-fab-five-to-dominate-stock-valuation-chart.
Park, B., & Judd, C. (2005). Rethinking the link between categorization and prejudice within the social cognition perspective. *Personality and Social Psychology Review, 9*(2), 108–130.
Plaut, V. C. (2002). Cultural models of diversity in America: The psychology of difference and inclusion. In R. Shweder, M. Minow, & H. R. Markus (Eds.). *Engaging cultural differences: The multicultural challenge in liberal democracies* (pp. 365–395). New York: Russell Sage Foundation Press.
Plaut, V. C., Thomas, K. M., Hurd, K., & Romano, C. A. (2018). Do color blindness and multiculturalism remedy or foster discrimination and racism? *Current Directions in Psychological Science, 27*(3), 200–206.
Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments & Computers, 36*, 717–731.
Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891.
Prentice, D. A., & Miller, D. T. (2006). Essentializing differences between women and men. *Psychological Science, 17*(2), 129–135.
Purdie-Vaughns, V., & Walton, G. M. (2011). *Is multiculturalism bad for African Americans? Redefining inclusion through the lens of identity safety. Moving beyond prejudice reduction: Pathways to positive intergroup relations.* 159–177.
Rattan, A., & Ambady, N. (2013). Diversity ideologies and intergroup relations: An examination of colorblindness and multiculturalism. *European Journal of Social Psychology, 43*(1), 12.
Reuben, E., Sapienza, P., & Zingales, L. (2014). How stereotypes impair women's careers in science. *Proceedings of the National Academy of Sciences, 201314788*.
Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe-Crowne social desirability scale. *Journal of Clinical Psychology, 38*(1), 119–125.
Richard, F. D., Bond, C. F., Jr., & Stokes-Zoota, J. J. (2003). One hundred years of social psychology quantitatively described. *Review of General Psychology, 7*, 331–363.
Richeson, J. A., & Nussbaum, R. J. (2004). The impact of multiculturalism versus color-blindness on racial bias. *Journal of Experimental Social Psychology, 40*, 417–423.
Rosenthal, R. (1991). *Meta-analytic procedures for social research.* Newbury Park, CA: SAGE.
Rucker, D., Preacher, K., Tormala, Z., & Petty, R. (2011). Mediation analysis in social psychology: Current practices and future directions. *Social and Personality Psychology Compass, 5*, 359–371.
Rudman, L. A., & Phelan, J. E. (2008). Backlash effects for disconfirming gender stereotypes in organizations. *Research in Organizational Behavior, 28*, 61–79.
Ryan, C. S., Hunt, J. S., Weible, J. A., Peterson, C. R., & Casas, J. F. (2007). Multicultural and colorblind ideology, stereotypes, and ethnocentrism among Black and White Americans. *Group Processes & Intergroup Relations, 10*(4), 617–637.
Sasaki, S. J., & Vorauer, J. D. (2013). Ignoring versus exploring differences between groups: Effects of salient color-blindness and multiculturalism on intergroup attitudes and behavior. *Social and Personality Psychology Compass, 7*(4), 246–259.
Steinmetz, K. (2018). Stitch fix CEO Katrina Lake on why gender matters in the business world. *Time*. Retrieved from: http://time.com/5263874/katrina-lake-stitch-fix-interview/.
Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology, 1*, 149–178.
Todd, A., & Galinsky, A. (2012). The reciprocal link between multiculturalism and perspective- taking: How ideological and self-regulatory approaches to managing diversity reinforce each other. *Journal of Experimental Social Psychology, 48*, 1394–1398.
Vorauer, J. D., Gagnon, A., & Sasaki, S. J. (2009). Salient intergroup ideology and intergroup interaction. *Psychological Science, 20*(7), 838–845.
Wolsko, C., Park, B., & Judd, C. M. (2006). Considering the tower of Babel: Correlates of assimilation and multiculturalism among ethnic minority and majority groups in the United States. *Social Justice Research, 19*, 277–306.
Wolsko, C., Park, B., Judd, C. M., & Wittenbrink, B. (2000). Framing interethnic ideology: Effects of multicultural and color-blind perspectives on judgments of groups and individuals. *Journal of Personality and Social Psychology, 78*(4), 635–654.
World Bank (2016). Digital dividends. World development report. Retrieved from: http://www.worldbank.org/en/publication/wdr2016.
Zou, L., & Cheryan, S. (2015). When Whites' attempts to be multicultural backfire in intergroup interaction. *Social Personality Psychology Compass, 9*(11), 581–592.