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Reactions to Male-Favoring vs. Female-Favoring Sex Differences: A Preregistered  
Experiment

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## Abstract

The primary aim of this study was to investigate how people react to research describing a sex difference, depending on whether the difference in question favors males or favors females. An additional aim was to see how accurately people can predict how the average man and the average woman will respond to such research. Western participants (N = 492) were presented with a fictional popular-science article describing either a male-favoring or a female-favoring sex difference (i.e., men/women are better at drawing; women/men lie more). Both sexes reacted less positively to the male-favoring differences, judging the findings less important, less plausible, more surprising, more offensive, more harmful, and more upsetting, as well as judging the research less well-conducted and studies of that type more inherently sexist. This reaction was driven in part by a belief in male privilege: The more strongly participants believed that men are privileged over women, the less positively they reacted to the male-favoring sex difference and the more positively they reacted to the female-favoring one (and vice versa for the minority of participants who believed that women are privileged over men). Participants predicted that the average man and the average woman would react more positively to sex differences favoring their own sex. This was true of the average woman, although the degree of own-sex favoritism was notably smaller than participants predicted. It was not true, however, of the average man who – like the average woman – reacted more positively to the female-favoring sex differences.

**KEYWORDS:** Gender; Male Privilege; Sex Differences; Sexism; Social Perception.

## Reactions to Male-Favoring vs. Female-Favoring Sex Differences: A Preregistered Experiment

From the moment of its inception, science has had to struggle with the fact that certain theories and findings – from the heliocentric model of the solar system to anthropogenic climate change – are highly controversial. Though commonly viewed as a problem on the political right, ideologically motivated science skepticism has been documented on both sides of the political aisle (Ditto et al., 2018; Kahan, Peters, Dawson, & Slovic, 2017; Washburn & Skitka, 2017). One area of research that tends to be more controversial on the left than the right is that related to sex differences (Pinker, 2016). A large literature suggests that men and women differ, on average, in a number of psychological traits, including interest in casual sex, propensity for aggression, and cognitive abilities such as mental rotation and verbal fluency (Archer, 2019; Halpern, 2012; Stewart-Williams & Thomas, 2013). Although clearly influenced by social factors, various lines of evidence suggest that, at least in some cases, these differences are shaped as well by biological factors: They appear across cultures, have been linked to prenatal hormonal exposure, and can be found as well in other animals subject to similar Darwinian selection pressures (Archer, 2019; Stewart-Williams, 2018; Stewart-Williams & Halsey, 2018). But although the research on human sex differences is relatively robust, the topic has sometimes provoked outrage, both inside and outside academia.

Two controversies in particular illustrate this point. First, in 2005, Harvard president Lawrence Summers provoked protests and ultimately had to resign after arguing that part of the reason that men are overrepresented in STEM fields may be that men are more variable in intellectual abilities, and thus that somewhat more men than women are found among the most cognitively able (as well as among the least). Second, in 2017, software engineer James Damore was fired from Google for promoting the idea that factors other than discrimination –

most importantly, average sex differences in interests and preferences – help to explain the predominance of men in the tech sector. Sex differences are clearly a hot-button topic.

But are all sex differences equally controversial? Much of the outrage surrounding the Summers and Damore affairs revolved around the perception that the differences they were pointing to put men in a better light than women. A number of commentators have argued, however, that sex differences that put *women* in a better light – for instance, the fact that women have better verbal skills, on average, and are less disposed to violence – tend not provoke so much consternation. The law professor Ann Althouse (2005) alluded to this asymmetry when she observed that, if you want to do research on sex differences, you have to interpret any findings in such a way as to show that women are superior. The hypothesis that people react more positively to female-favoring sex differences than male-favoring differences was the main focus of the present study.

### *Women (and Children) First*

At first glance, this hypothesis might seem counterintuitive; after all, it flies in the face of the common assumption that people in general, and men in particular, hold women in lower esteem than they do men. However, a great deal of research in social psychology supports the expectation.

First, people often have more positive attitudes and feelings about women than men, and their stereotypes of women tend to be more favorable. Eagly and colleagues have dubbed this the Women Are Wonderful (WAW) effect (Eagly & Mladinic, 1994). The finding is not that women are seen as superior in every trait, but rather that they are seen as more likeable. No doubt, there are exceptions to this rule. Still, the effect seems to be fairly robust and has been documented in several nations (Glick et al., 2004). Because people tend to evaluate

women more positively, research demonstrating male-favoring sex differences may provoke a more negative reaction, and a stronger inclination to explain away the results.

Second, people tend to be more concerned about harms suffered by women than men. For example, people see aggression perpetrated against women as more serious than equivalent aggression perpetrated against men (Harris & Knight-Bohnhoff, 1996; Stewart-Williams, 2002); people are more willing to give up potential participation money to prevent an electric shock being delivered to a woman than a man (FeldmanHall et al., 2016); and, in the classic hypothetical trolley dilemma, people are more willing to push a man than a woman off a footbridge to stop an out-of-control train killing five people further along the track (FeldmanHall et al., 2016). To the extent that unfavorable scientific findings about a group are seen as a harm to the group's members, people may be more concerned about findings unfavorable to women than those unfavorable to men.

Third, in many situations, people are more protective of women than men. This tendency, which is sometimes considered a form of *benevolent sexism* (Glick & Fiske, 1997), manifests itself in a wide range of ways. People are more likely to help women than men; more likely to support policies aimed at helping women; and more willing to donate money to a female-only than a male-only homeless shelter (Eagly & Crowley, 1986; Reynolds et al., manuscript under review). Similarly, criminal defendants who harm women receive harsher sentences than those who harm men (Curry, Lee, & Rodriguez, 2004; Glaeser & Sacerdote, 2003; Shatz & Shatz, 2012), and male defendants tend to get harsher sentences than female defendants for the same crimes, even controlling for criminal history (Mazzella & Feingold, 1994; Starr, 2015). The gender gap in sentencing is particularly pronounced when the judge is a man, suggesting that the effect is due in part to male paternalism (Schanzenbach, 2005). Certainly, there are instances where females' welfare is treated as secondary to males';

female-biased infanticide in several cultures is arguably the clearest example. However, at least in the modern Western world, the general trend seems to be in the opposite direction.

Where might these tendencies come from? Opinions differ. One suggestion is that they trace to the fact that women are, on average, less physically strong and robust than men, and thus somewhat more vulnerable. Another suggestion is that they trace to the fact that, as a result of sex differences in the minimum biological expenditure required to produce a single offspring, women are more “reproductively valuable” than men: If half the woman in a group were wiped out, the group would struggle to produce enough children to maintain itself in the next generation; if all but one of the men were wiped out, the group could still produce almost as many children as it otherwise would (Baumeister, 2010; Reynolds et al., manuscript under review). In either case or both, the sex differences in question could create biological and/or cultural selection pressures favoring greater concern for women’s welfare than men’s. If so, we would expect people’s greater concern about women’s welfare to be widespread, as a result of the fact that it originates in aspects of human physiology and reproductive biology that themselves are widespread – namely sex differences in physical formidability and minimum obligate investment in offspring.

On the other hand, it may be that the concern gender gap is more localized, and found in some cultures rather than others. The gap may, for instance, be a product of the prevailing political ideologies found in Western or WEIRD nations. One such ideology has been dubbed *equalitarianism* by Winegard, Clark, Hasty, and Baumeister (2018, 2019). This ideology – which is more common on the political left – involves a strong focus on perceived victim groups, a belief that any disadvantages of victim groups are due to prejudice and discrimination from privileged groups, and a consequent aversion to any fact or finding that portrays privileged groups in a more positive light. In the context of gender, equalitarianism may result in what Seager and Barry (2019) call the *gamma bias*: a tendency to focus on and

exaggerate ways in which men are privileged and women disadvantaged, and to ignore and minimize the ways in which men are disadvantaged and women privileged. It may also lead people to interpret ambiguous cases as instances of male privilege or of female disadvantage.

We see, then, that there are both global and local explanations for the tendency to prioritize women's welfare. Needless to say, a hybrid model is possible as well: People may tend to be more protective of women than men for reasons that transcend cultural boundaries, but this tendency may be exacerbated (or inhibited) by the prevailing ideologies of particular places and times. In lieu of further evidence, this seems like a reasonable default position.

Regardless of its ultimate origins, though, the tendency to be more protective of women may impact people's reactions to claims about sex differences. Specifically, people may react less positively to claims about male-favoring sex differences than to claims about differences that favor females. They may find the former harder to believe, and judge the evidence supporting them to be more suspect (Colombo, Bucher, & Inbar, 2016; Lord, Ross, & Lepper, 1979; Winegard et al., 2018, 2019). Moreover, to the extent that they do accept the findings, they may view them as more unpleasant and potentially harmful, and prefer to chalk them up to nurture more than nature – in part because they conflate “natural” with “good,” and in part because they assume that the differences would then be more easily eliminated. Although such reactions are likely to be common, they may be particularly pronounced among people who lean to the left politically, and who strongly believe that men are unfairly privileged over women.

### *Gender Tribalism*

There is, however, a complication. Although both sexes may tend to react more positively to female- than to male-favoring sex differences, they may not do so to the same degree. One of the best-supported findings in social psychology is that people are prone to

ingroup biases: They perceive members of their own groups more favorably than those of others (Tajfel, Billig, Bundy, & Flament, 1971). Ingroup biases can form along any dimension of group identity, including gender. Both sexes appear to be prone to gender-ingroup biases, although several studies suggest that females are more prone than males (Eagly & Crowley, 1986; FeldmanHall et al., 2016; Olsen & Willemsen, 1978; Reynolds et al., manuscript under review; Rudman & Goodwin, 2004). Gender-ingroup biases may affect people's assessments of research related to sex differences. In one study, for example, men rated studies showing gender bias against women in STEM as lower in quality than did women (Handley, Brown, Moss-Racusin, & Smith, 2015). The study did not look at how people rated studies showing bias against *men* in STEM; however, it did look at how they rated studies finding no bias, and found that *women* rated these studies as lower in quality than men. Thus, both sexes exhibited an own-sex bias in their reactions to the studies.

If gender-ingroup biases were the only relevant variable, the natural expectation would be that men would react more positively to male-favoring sex differences whereas women would react more positively to female-favoring ones. We call this the *Gender Tribalism hypothesis*. For the reasons discussed in the last section, it seems unlikely that gender ingroup biases are the only relevant variable. It may be, however, that such biases will moderate the tendency to react more positively to female-favoring than male-favoring sex differences, such that this tendency will be stronger among women than men (for comparable findings, see (Eagly & Mladinic, 1994; Fortune, 2006; Glick et al., 2004; Herlitz & Lovén, 2013; Veldkamp, Hartgerink, van Assen, & Wicherts, 2017)).

### *Lay Estimates of Gender Bias*

An additional question is whether people can accurately predict the reactions of the average man and the average woman to research describing male-favoring vs. female-



favoring sex differences. Contrary to a long-held belief in social psychology, people's stereotypes about major demographic groups tend to be reasonably accurate, and gender stereotypes are no exception to this rule (Jussim, 2012; Jussim, Crawford, & Rubinstein, 2015). Is this the case, though, when it comes to the contentious issue of men and women's proneness to gender bias? In one study, Stewart-Williams (2002) found that both sexes tend to overestimate the extent to which people are biased in favor of members of their own sex in their evaluation of aggression perpetrated by men vs. by women. Meanwhile, other research suggests that people *underestimate* the extent to which men hold pro-female attitudes (Diekmann, Eagly, & Kulesa, 2002; Fortune, 2006). In light of such studies, it seems likely that people will overestimate the extent to which individuals react more positively to sex differences that flatter their own sex, and more negatively to sex differences that flatter the other.

### *Aims and Hypotheses*

Based on the foregoing discussion, the present study aimed to investigate the following hypotheses.

1. On average, both sexes will react more positively to female-favoring sex differences than to male-favoring differences. They will view female-favoring differences as more interesting, important, and plausible, and studies finding such differences as better conducted. Conversely, they will view male-favoring differences as more surprising, offensive, harmful, and upsetting, and such studies as more inherently sexist. Finally, people will view male-favoring sex differences as a product of nurture rather than nature to a greater extent than female-favoring sex differences.
2. These effects will be moderated by the sex of the participant, such that, on average, the preference for female-favoring sex differences will be stronger among women than men.
3. Both sexes will tend to overestimate the extent to which the average man and the average woman are biased in favor of their own sex in their reactions to male- vs. female-favoring sex differences.

An additional aim of the study was to explore the relationship between people's reactions to research on sex differences and two other variables: their political orientation and their belief in male privilege. Note that the study and hypotheses were preregistered with OSF; see <https://osf.io/6n5up/>.

## Method

### *Participants*

Participants were recruited from the website Prolific.ac (which pays people a small sum to complete online surveys and experiments), supplemented with a convenience sample consisting largely of people responding to advertisements on the website Reddit. The final sample included 492 people: 256 men and 236 women. The minimum number of participants needed for each experimental condition was calculated in advance using the freeware program G\*Power, with alpha set at .05 and power at .95, and looking for at least a medium effect size (Faul, Erdfelder, Lang, & Buchner, 2007). All participants were recruited before data analysis commenced. The age range of the sample was 18 to 73 years ( $M = 31.78$ ;  $SD = 10.3$ ), with no significant age difference between the sexes ( $t_{487} = -.548$ ,  $p = .584$ ). Most participants were White (84.1%); had some college/university education (94.5%); and resided in the United States (47%), the United Kingdom (35.2%), or Canada (11.8%). Most had no religion (61.9%) or were Christians (31.4%). Participants varied in religiosity, ranging from the very religious (1) to the very non-religious (5); the most common response, however, was “very non-religious” (44.7%), and thus the average level of religiosity was somewhat skewed toward the low-religiosity side of the scale ( $M = 3.76$ ;  $SD = 1.32$ ). The full range of political views was represented in the sample; however, the average fell somewhat to the left of the political spectrum ( $M = 2.99$ ;  $SD = 1.47$ , on a scale spanning from 1 [“Extremely left or

liberal”] to 7 [“Extremely right or conservative”]). The sexes did not differ in their average political orientation ( $t_{483} = .255, p = .799$ ).

### *Materials and Procedure*

After providing some basic demographic information, participants were presented with one of four versions of a popular-science article (which, unbeknownst to them, was invented for the present study). Two versions of the article reported on a sex difference in a desirable trait (drawing ability), and two reported on a sex difference in an undesirable trait (lying frequency). Within each of these conditions, one version of the article presented a male-favoring version of the hypothetical finding (i.e., men scored higher on drawing ability or lower on lying frequency), whereas the other presented a female-favoring version (the reverse). We did not have any specific hypotheses regarding the two traits used in the study, or any expectation that the valence of the traits would have any meaningful effects. The rationale for including them was that it would enable us to assess whether any effects of the variable Sex Favored were merely idiosyncratic reactions unique to any one particular trait, or to desirable vs. undesirable traits in general.

Each of the hypothetical articles included both a verbal description of the putative sex difference, and a bar graph to complement the description. Participants were asked to “read the excerpt and study the graph carefully – carefully enough that you’ll be able to answer questions about them later.” Having done this, they then completed four questionnaires.

*Reaction-to-Research Questionnaire.* The first questionnaire asked participants for their views about the study and its findings. Specifically, it asked them how interesting, important, plausible, surprising, offensive, harmful, and upsetting they thought the results were; how well-conducted they thought the study was; how inherently sexist they thought research of this kind is; and to what extent they thought the sex difference was due to nurture

more than nature. All responses were registered on Likert-type scales spanning from 1 to 7, with one exception: The Nurture > Nature item employed a 1 to 5 scale, where 1 meant 100% nature and 5 meant 100% nurture. Finally, participants were asked to indicate how well they felt they understood the graph, using a Likert-type scale spanning from 1 (“Didn’t understand at all”) to 7 (“Understood completely”). The vast majority of participants reported that they understood the graph well ( $M = 5.85$ ,  $SD = 1.32$ ).

*How Does the Average Man/Average Woman Think?* The next two questionnaires were designed to elicit participants’ predictions about how the average man and the average woman would respond to the hypothetical research. To do this, we repeated the questions from the Reaction-to-Research questionnaire, except that instead of asking participants about their own reactions, we asked them what they thought the reaction of the average man and average woman doing the study would be.

*Male Privilege Belief Scale.* The fourth and final questionnaire asked participants for their views about how privileged men and women are in society. The items in this questionnaire were adapted from the four-item “Belief in White Privilege” measure devised by Martin and Nezlek (2014), except with “men” replacing “Whites,” and “women” replacing “non-Whites,” for each of the items. So, for example, the item “Do you think Whites have fewer opportunities or more opportunities than non-Whites?” was replaced with “Do you think men have fewer opportunities or more opportunities than women?” The response scales ranged from -3 to 3, with scores greater than 0 indicating a belief that men are privileged over women, scores less than 0 indicating a belief that women are privileged over men, and 0 indicating a belief that neither sex is privileged over the other.

Note that the materials and procedures for the study were approved in full by the relevant ethics committees at the University of Nottingham Malaysia Campus and Swansea University.

## Results

Data were analyzed using a pair of two-way MANOVAs, one for the individual items and one for the aggregate variables created from those items (as explained below). The two factors were Sex Favored and Participant Sex. We did not include Trait Valence as an additional factor because preliminary analyses showed that this variable did not interact consistently with either Sex Favored or Participant Sex, and, in the few cases where it did, it did not change the direction of the effects in question. This suggests that the effects of Sex Favored and Participant Sex are not unique to any particular trait, or to desirable vs. undesirable traits, but are relatively robust.

### *Participants' Reaction to Research*

To begin with, we examined participants' reaction to the research. To get an overall sense of their reaction, we created an aggregate Reaction-to-Research variable, based on the individual items in the survey, other than the Nurture > Nature item. We excluded the latter because it only weakly correlated with the rest. The nine remaining items had a good level of internal consistency ( $\alpha = .8$ ). Note that we reverse-scored the five items indicating a negative reaction to the research, namely Surprising, Offensive, Harmful, Upsetting, and Inherently Sexist.<sup>1</sup> Thus, higher scores on the aggregate item indicated a more positive view of the research.

To assess Hypothesis 1, we looked at the effect of Sex Favored on participants' responses to the hypothetical popular-science article. Consistent with expectations, participants were somewhat more positive about the female-favoring sex differences than the

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<sup>1</sup> In principle, surprise could be a positive *or* a negative reaction; however, the item correlated much more strongly with the others when treated as a negative reaction.

male-favoring ones ( $F_{1, 484} = 30.14, p < .001, \eta_p^2 = .06$ ; see Figure 1, “Overall: Aggregate Variable”). To get a more nuanced picture, we also looked at the main effects of Sex Favored on each of the individual items (see Supplementary Tables 1 and 2 for the descriptive and inferential statistics related to the individual items). In most cases, the main effects were significant. As Figure 1 shows, when the reported sex difference favored females, participants viewed the findings as more important and plausible, and the study as better conducted. Conversely, when the reported sex difference favored *males*, participants viewed the hypothetical findings as more surprising, offensive, harmful, and upsetting, and such studies as more inherently sexist. Contrary to expectations, Sex Favored did not affect how interesting participants found the study, or the extent to which they attributed the findings to nurture more than nature.

-----Insert Figure 1 about here-----

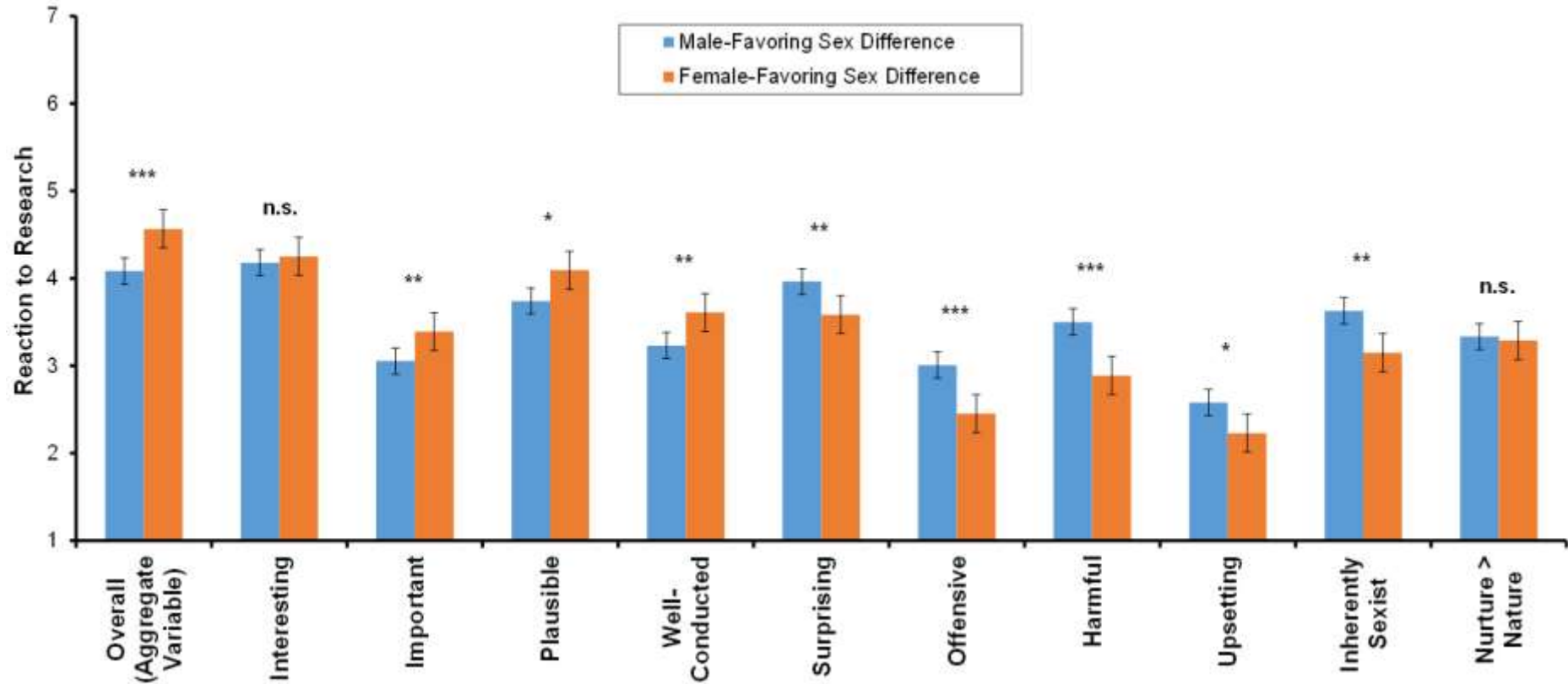


Figure 1. Participants' reactions to hypothetical research describing a male-favoring vs. a female-favoring sex difference: overall (aggregate variable) and individual items. Higher scores on the aggregate variable indicate a more positive reaction; higher scores on the individual items indicate stronger agreement that the descriptor applies to the hypothetical findings. In general, participants reacted more positively to female-favoring than male-favoring differences. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; n.s.: not significant.

We next looked at the effects of Participant Sex on reactions to the hypothetical research. Averaging across the male-favoring and female-favoring conditions, men were slightly more positive overall than women about the research ( $F_{1, 484} = 9.11, p = .003, \eta_p^2 = .02$ ). Looking at the individual items, Participant Sex had a significant main effect on five of the ten individual items (see Supplementary Tables 1 and 2). Men were more likely to view the research as plausible; women, in contrast, were more likely to view the findings as offensive, harmful, and upsetting, and to see research of this type as more inherently sexist. The sexes did not differ in the extent to which they saw the findings as interesting, important, or surprising, the research as well-conducted, or the sex difference as a product of nurture more than nature.

Finally, we looked at whether Sex Favored and Participant Sex interacted. For the aggregate variable, there was no interaction, indicating that both sexes not only preferred female-favoring sex differences to male-favoring ones, but did so to the same degree – contrary to Hypothesis 2 ( $F_{1, 484} = 2.76, p = .097, \eta_p^2 = .01$ ). An analysis of the individual items largely confirmed this pattern: Sex Favored did not interact with Participant Sex for most of the individual items. There were, however, two exceptions. First, women thought the study was better-conducted when it revealed a female-favoring sex difference than a male-favoring one ( $F_{1, 229} = 20.46, p < .001, \eta_p^2 = .08$ ), whereas men thought it was equally well-conducted regardless of the favored sex ( $F_{1, 249} = 1.22, p = .271, \eta_p^2 = .01$ ). Second, women rated the study as more potentially harmful when it revealed a male-favoring sex difference ( $F_{1, 231} = 23.02, p < .001, \eta_p^2 = .09$ ), whereas men did not rate it as any more or less harmful ( $F_{1, 253} = 3.54, p = .061, \eta_p^2 = .01$ ). In other words, female participants drove the overall main effect of Sex Favored on the variables Well-Conducted and Harmful. These findings are broadly consistent with Hypothesis 2; the preponderance of evidence, however, is not. (See Supplementary Tables 1 and 2 for all the relevant descriptive and inferential statistics.)



*Political Orientation and Belief in Male Privilege*

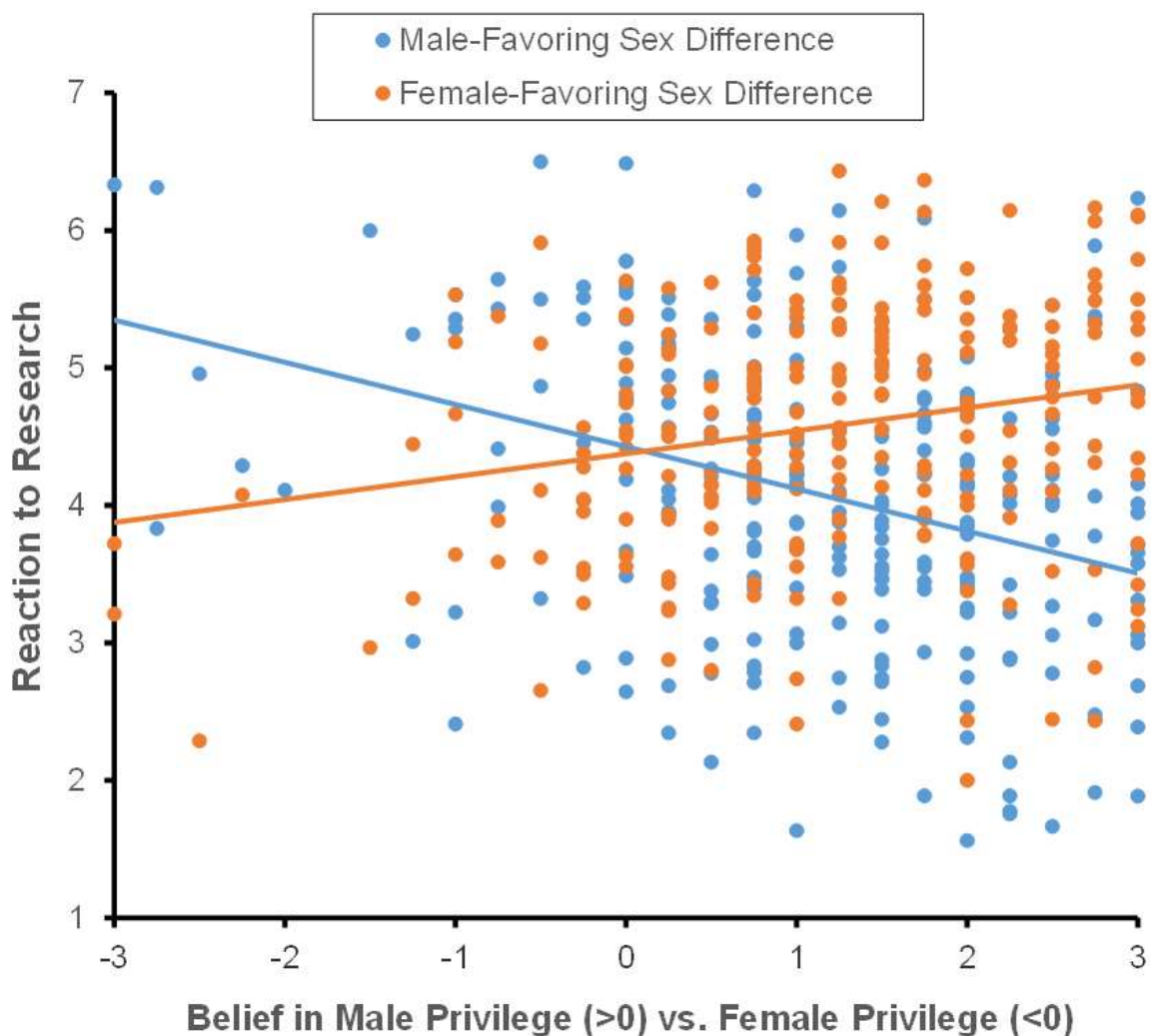
Our next goal was to explore the associations between participants' reactions to the research and two possible predictor variables: political orientation and belief in male privilege. As mentioned, political orientation was measured using a single item, with the average participant falling somewhat to the left of the political spectrum ( $M = 2.99$  on a 1-7 scale where 1 represents strongly left, 7 represents strongly right, and 4 represents the center point). Belief in male privilege, in contrast, was measured using a four-item scale. The items in question had a high level of internal consistency ( $\alpha = .88$ ), and thus were aggregated. As discussed, a score of 0 represents the view that neither men nor women are privileged over the other, positive values represent the view that men are privileged over women, and negative values represent the view that women are privileged over men. Both sexes tended to view men as privileged over women, though on average, women did so to a greater extent ( $M = 1.52$ ,  $SD = 1.01$  for women vs.  $M = 0.81$ ,  $SD = 1.2$  for men;  $F_{1, 490} = 49.33$ ,  $p < .001$ ,  $\eta_p^2 = .09$ ). Only a minority of the sample (11.2%) viewed women as more privileged than men. This included 16.4% of the men and 5.5% of the women.

Linear regression showed that political orientation and male privilege belief partially predicted participants' reactions to both the male-favoring sex differences ( $R^2 = .154$ ,  $F_{2, 242} = 22.1$ ,  $p < .01$ ) and the female-favoring sex differences ( $R^2 = .047$ ,  $F_{2, 237} = 5.83$ ,  $p = .003$ ). The effects of political orientation were somewhat modest. The more that people leaned left politically, the less positively they reacted to the male-favoring findings ( $\beta = .157$ ,  $t_{242} = 3.39$ ,  $p = .001$ ): a small but significant effect. In contrast, political orientation had no significant effect on reactions to the female-favoring findings ( $\beta = -.03$ ,  $t_{237} = -.74$ ,  $p = .459$ ).

The effects of male privilege belief, while also modest, were larger and more consistent. The more strongly people believed in male privilege, the less positively they

responded to the male-favoring sex differences ( $\beta = -.248$ ,  $t_{242} = -4.28$ ,  $p < .001$ ), and the more positively they responded to the female-favoring differences ( $\beta = .15$ ,  $t_{237} = 2.91$ ,  $p = .004$ ). The converse was true as well: The more strongly people believed in *female* privilege, the more positively they responded to the male-favoring differences and the less positively they responded to the female-favoring ones. The regressions for male privilege belief are shown in Figure 2. Notice that the regression lines crossover at almost exactly the zero point on the Male Privilege Belief scale. This suggests that participants who believed that neither sex is more or less privileged than the other were the least likely to react differently to the hypothetical sex differences depending on which sex was favored.

-----Insert Figure 2 about here-----



*Figure 2.* Participants' reactions to hypothetical research showing a male- vs. a female-favoring sex difference as a function of belief in male vs. female privilege. Higher scores indicate more positive reactions. The regression lines indicate that the stronger participants' belief in male privilege, the more positive their reaction to female-favoring sex differences and the less positive their reaction to male-favoring ones (and the opposite for the minority who believe in female privilege).

#### *Participants' Predictions about Men and Women's Gender Bias*

To explore participants' predictions about how the average man and the average woman would react to male- vs. female-favoring sex differences, we first created two aggregate variables from the individual items on the prediction questionnaires: one for predictions about the average man and one for predictions about the average woman. Again, the Nurture > Nature items were excluded as they reduced the internal consistency of the aggregate variables. The remaining items exhibited a high level of internal consistency ( $\alpha = .86$  for the average-man variable;  $\alpha = .9$  for the average-woman). Participants' predictions are shown in Figure 3, alongside the actual findings of the study.

-----Insert Figure 3 about here-----

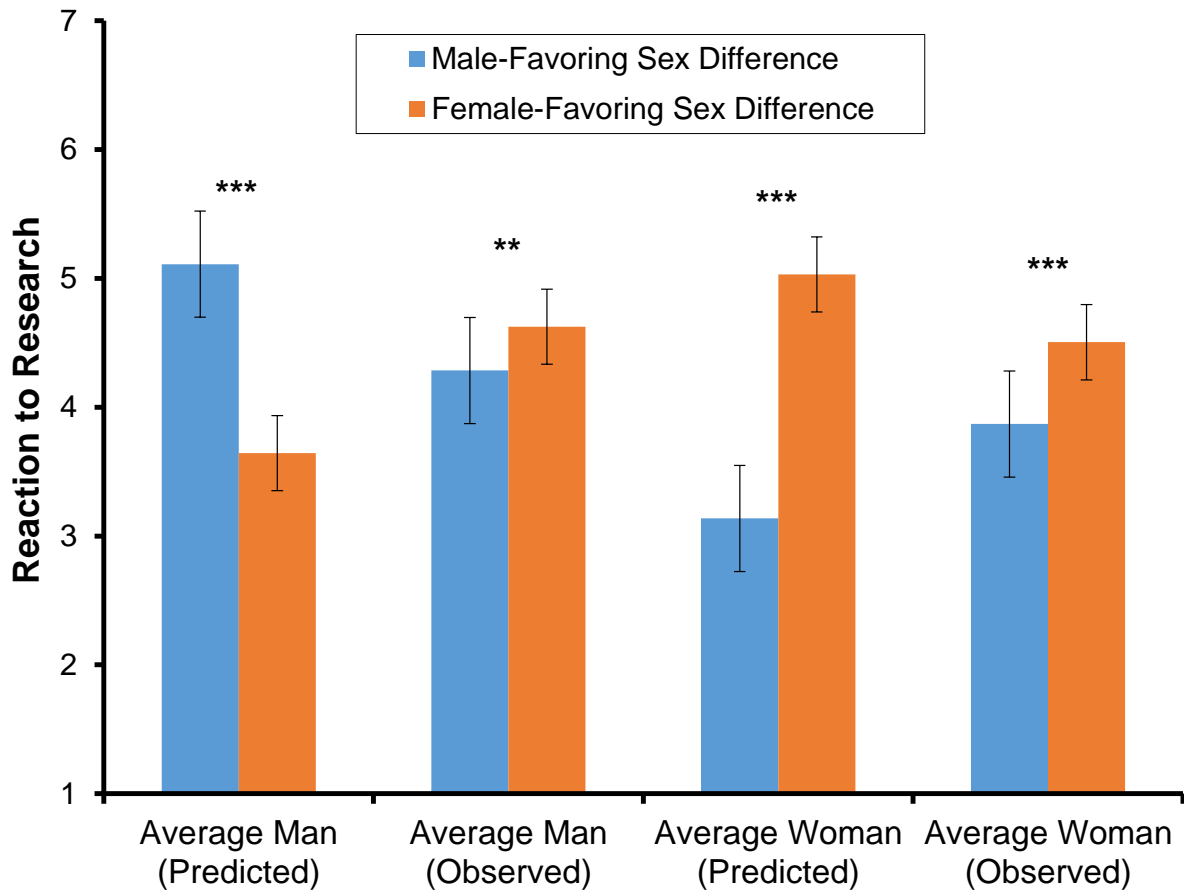


Figure 3. Participants' predictions regarding the reactions of the average man and the average woman to male-favoring vs. female-favoring sex differences, alongside the actual reactions observed in the study. Higher scores indicate more positive reactions. Participants predicted much larger, own-sex-favoring reactions than were actually observed, and – in the case of the average man – got the direction of the effect wrong. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ; n.s.: not significant.

We start with participants' predictions regarding the average man. Consistent with Hypothesis 3, participants predicted that, overall, the average man would respond more positively to male-favoring than female-favoring sex differences ( $F_{1, 484} = 346.12, p < .001, \eta_p^2 = .42$ ). Looking at the individual items, the main effect of Sex Favored was significant for all of the average-man items (see Supplementary Tables 3 and 4 for the relevant descriptive

and inferential statistics). Participants predicted that the average man would find the male-favoring results more interesting, important, and plausible, and would agree more that the study was well-conducted. Conversely, participants predicted that the average man would find the *female*-favoring results more surprising, offensive, harmful, and upsetting, and would agree more that such studies are inherently sexist. Finally, participants predicted that the average man would think that nurture played a larger role, and nature a smaller one, in shaping a female-favoring sex difference than a male-favoring one.

Participants' predictions regarding the average man's response to the research were uniformly false. Contrary to their collective expectations, the average man reacted more positively overall to the *female*-favoring than the male-favoring sex differences ( $F_{1, 254} = 8.35, p = .004, \eta_p^2 = .03$ ; see Figure 3). Regarding the individual items, as mentioned, the average man either reacted more positively to the female-favoring findings, or did not react differently depending on which sex was favored.

There was no main effect of Participant Sex for the average-man aggregate variable ( $F_{1, 484} = 2.69, p = .102, \eta_p^2 = .01$ ). There was, however, a small Sex Favored \* Participant Sex interaction ( $F_{1, 484} = 22.27, p < .001, \eta_p^2 = .04$ ). Post-hoc tests revealed that, although both sexes predicted that the average man would react more positively to male-favoring than female-favoring sex differences, female participants predicted a stronger own-sex bias than did males themselves: That is, female participants predicted that the average man would have a stronger positive reaction to male-favoring sex differences than did male participants ( $F_{1, 245} = 5.91, p = .016, \eta_p^2 = .02$ ), and a less positive response to female-favoring differences ( $F_{1, 241} = 17.76, p < .001, \eta_p^2 = .07$ ). A similar pattern was evident for eight of the individual items; for the other two, there was no Sex Favored \* Participant Sex interaction (see Supplementary Tables 3 and 4).

We turn now to participants' predictions regarding the average woman. Again consistent with Hypothesis 3, participants predicted that, overall, the average woman would react more positively to female-favoring than to male-favoring sex differences ( $F_{1, 484} = 503.94, p < .001, \eta_p^2 = .51$ ; see Figure 3). Breaking this down, the main effect of Sex Favored was significant for all of the average-woman individual items, and in each case was the mirror image of the average-man prediction (see Supplementary Tables 5 and 6). Participants predicted that the average woman would find the female-favoring sex difference more interesting, important, and plausible, and would agree more that the study was well-conducted. Conversely, participants predicted that the average woman would find the *male*-favoring sex difference more surprising, offensive, harmful, and upsetting, and would agree more that such studies are inherently sexist. Finally, participants predicted that the average woman would think that nurture played a larger role, and nature a smaller one, in shaping male-favoring sex differences than differences favoring females.

Consistent with participants' predictions, the average woman did indeed react more positively to female- than male-favoring sex differences ( $F_{1, 234} = 26.36, p < .001, \eta_p^2 = .1$ ; see Figure 3). Note, though, that the actual effect size was notably smaller than the predicted one ( $\eta_p^2 = .1$  vs.  $\eta_p^2 = .51$ , respectively). In other words, participants overestimated how positively the average woman would react to a female-favoring sex difference, and how negatively the average woman would react to a male-favoring one. Looking at the individual items, participants were correct in all of their predictions, except Interesting and Nurture > Nature, for which there was no effect of Sex Favored for either sex (as discussed earlier).

For the aggregate average-woman variable, there was no main effect of Participant Sex ( $F_{1, 484} = .39, p = .531, \eta_p^2 < .01$ ), and no interaction between Sex Favored and Participant Sex ( $F_{1, 484} = .13, p = .721, \eta_p^2 < .01$ ). Thus, whereas women predicted more own-sex bias from the average man than did men, men did not predict more own-sex bias from the

average woman than did women. This was the case as well for most of the individual items (see Supplementary Tables 5 and 6).

## Discussion

The present study yielded four main findings: (1) People react more positively to research revealing female-favoring than male-favoring sex differences. (2) There is little evidence of gender tribalism in reactions to the research, at least among men. (3) The preference for female-favoring sex differences is partially mediated by belief in male privilege. (4) People overestimate the level of own-sex bias exhibited by women, and falsely assume that men will exhibit an own-sex bias in evaluating research on sex differences. Below we consider each of these findings in turn.

### *1. People React More Positively to Female-Favoring Sex Differences*

As expected, participants reacted more positively to female-favoring sex differences than to male-favoring ones. They found the female-favoring differences more emotionally congenial, and judged the research revealing them as higher in quality – a finding consistent with other work in the area (e.g., Winegard et al., 2018). The trend makes good sense in light of prior research suggesting that people tend to be more positive about women, more concerned about harms suffered by women, and more protective of women than men (Eagly & Mladinic, 1994; Reynolds et al., manuscript under review; Stewart-Williams, 2002).

Contrary to expectations, however, participants did not view female-favoring differences as more interesting, and did not view male-favoring differences as more a product of nurture than female-favoring differences. The latter result was particularly surprising given that participants themselves predicted that the average man and the average woman would attribute sex differences favoring the other sex to nurture more than nature. It

is unclear why this pattern failed to materialize; it seems, however, that people more readily downgrade unwelcome findings by assailing the quality of the study than by attributing the findings to nurture more than nature.

## *2. There is Little Evidence of Gender Tribalism, at Least among Men*

Contrary to expectations, women did not generally react more positively than men to the female-favoring sex differences, nor more negatively than men to the male-favoring ones. For a few individual items, such a pattern was evident, suggesting that gender tribalism may have some impact on people's reactions. Overall, though, the sexes differed little in their reactions. Both sexes found the female-favoring differences more agreeable.

There are several ways to interpret this finding. One is that women exhibit an own-sex bias whereas men do not. This interpretation is consistent with other studies suggesting that gender is more important as a group identity for women than men (e.g., (Hook, 2019). As a result, men may be less prone to own-sex bias. Indeed, in this study, men instead exhibited an *other-sex* bias, perhaps as a result of protectiveness toward women.

It might be argued, however, that it would be something of a coincidence if gender-ingroup bias in women and protectiveness toward women in men happened to balance out perfectly, thereby eliminating any sex differences. As such, an alternative explanation is that the pro-female reactions of both sexes stem from attitudes and inclinations not specific to either, including greater protectiveness toward women and – as we discuss in the next section – a belief in male privilege. If so, then although women do exhibit a bias in favor of members of their own sex, this is not necessarily *because* they are members of their own sex. Note that, although this interpretation fits with the findings of the present study, it would not explain other research suggesting women exhibit more pro-female favoritism than do men (e.g.,



(Eagly & Mladinic, 1994; Fortune, 2006; Glick et al., 2004; Herlitz & Lovén, 2013; Veldkamp et al., 2017).

### *3. The Preference for Female-Favoring Sex Differences is Partially Mediated by Belief in Male Privilege*

Perhaps surprisingly, political orientation explained little of the variance in people's reactions to male- vs. female-favoring sex differences. On the one hand, the more that participants lent to the left politically, the more negatively they responded to the male-favoring differences. On the other hand, the strength of the association was weak, and there was no relationship between political orientation and responses to female-favoring differences.

Belief in male privilege was somewhat more powerful as a predictor. The more strongly participants believed that men are privileged over women, the more positive their reaction to the female-favoring sex differences and the more negative their reaction to the male-favoring differences. At the other end of the spectrum, the more strongly participants believed in *female* privilege, the more they exhibited the opposite patterns of reactions. Note that, because relatively few participants believed in female privilege, participants as a whole reacted more positively to the female-favoring differences.

To the extent that belief in male privilege explains the results, it suggests that people react more positively to female-favoring sex differences because they view women as somewhat downtrodden (see (Winegard et al., 2018). Male-favoring differences may be seen as a manifestation of privilege and prejudice, whereas female-favoring differences may be seen as the underdog prevailing against the odds. That said, belief in male privilege explained a relatively modest fraction of the variance, and thus is only one contributing factor among many.

#### 4. People Overestimate the Level of Gender Bias Exhibited by Both Sexes, but Especially Men

Participants were quite inaccurate in their predictions about how the average person would respond to male-favoring vs. female-favoring sex differences. Both sexes predicted that the average person would exhibit a strong own-sex bias: that the average man would react more positively to male- than female-favoring findings, whereas the average woman would do the reverse. These predictions were misguided in two main ways. First, participants greatly overestimated the level of gender bias found in either sex. People expect a lot more gender-ingroup bias than is actually present. Second, in their predictions about the average man, participants not only overestimated the magnitude of bias, they got the direction of the effect wrong. Specifically, they assumed that the average man would react more positively to the male-favoring differences, when in fact he reacted more positively to the female-favoring ones. This represents a notable exception to the rule of *stereotype accuracy*: the finding that people's stereotypes of demographic groups tend to be reasonably accurate (Jussim, 2012; Jussim et al., 2015).

Why did people overestimate the level of gender bias? One possibility is that people tend to overestimate the magnitude of *all* effects in psychology, and thus that there is nothing unique about this particular instance. This could not be a complete explanation of the results, however, as it would not explain why participants predicted that men would exhibit an own-sex bias when in fact they exhibited the opposite. A possible explanation for that finding is that gender bias is a prominent culture-war topic, and that people think that men are biased in favor of their own sex for the simple reason that they are so often *told* that men are biased in favor of their own sex. The results of the present study suggest, however, that this generalization might not be accurate, or at least not widely generalizable.

The fact that people overestimate the magnitude of gender favoritism in each sex could have important societal implications (Stewart-Williams, 2002). An exaggerated impression of the level of favoritism that people exhibit toward their own sex is unlikely to foster positive relations between the sexes. On the contrary, it could foster resentment and suspicion. It might even function as a self-fulfilling prophesy, as people seek to obtain advantages for their own sex defensively assumed to be sought by the other (Fortune, 2006). When it comes to gender, and potentially other demographic categories as well, the main lesson to be drawn from social psychological research into ingroup-outgroup biases might not be that people are biased in favor of their own groups – people already know that – but rather that people commonly overestimate the extent of these biases. If so, a more accurate view of the situation might help to foster more harmonious relationships among groups.

#### *Limitations and Future Directions*

The present study had a number of limitations. Perhaps the most significant is that the sample was relatively non-religious and somewhat Left-leaning. As such, it is not clear whether the findings of the study represent the reaction of people in general or the reaction of non-religious, Left-leaning people in general. It is also not clear to what extent the reaction reflects a kind of protectiveness toward women that transcends cultural boundaries or instead modern progressive sentiments found more in the Western world than elsewhere. For both reasons, it would be interesting and informative to run the study again in a less Westernized, less gender-equitable nation, and see whether the same results obtain.

#### *Conclusion*

When it comes to research on sex differences, people respond more positively to findings that favor females than those that favor males. This is the case for both sexes, not

just women, contrary to the Gender Tribalism hypothesis. The pro-female tendency is due in part to a belief in male privilege, and may be reversed among the minority of people who believe that women are privileged over men. Although statistically robust, the preference for female-favoring findings is not especially large. A notably larger effect is that people *predict* that both sexes will respond more positively to sex differences that favor their own sex:

People overestimate the extent to which women react positively to female-favoring differences, and incorrectly assume that men will react more positively to male-favoring ones. The idea that people are strongly biased toward members of their own sex appears to be an overstatement – an unfortunate cognitive distortion that could potentially have a damaging impact on relations between the sexes.

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