



# Pragmatic bias impedes women's access to political leadership

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Progress toward gender equality is thwarted by the underrepresentation of women in political leadership, even as most Americans report they would vote for women candidates. Here, we hypothesize that women candidates are often disadvantaged by pragmatic bias, a tendency to withhold support for members of groups for whom success is perceived to be difficult or impossible to achieve. Across six studies ( $N = 7,895$ ), we test whether pragmatic bias impedes women's access to a highly significant political leadership position—the US presidency. In two surveys, 2020 Democratic primary voters perceived women candidates to be less electable, and these beliefs were correlated with lower intentions to vote for women candidates (Studies 1 and 2). Voters identified many reasons women would be less electable than men, including others' unwillingness to vote for women, biased media coverage, and higher requirements to prove themselves. We next tested interventions to reduce pragmatic bias. Merely correcting misperceptions of Americans' reported readiness for a woman president did not increase intentions to vote for a woman (Study 3). However, across three experiments (including one preregistered on a nationally representative sample), presenting evidence that women earn as much support as men in US general elections increased Democratic primary voters' intentions to vote for women presidential candidates, an effect driven by heightened perceptions of these candidates' electability (Studies 4 to 6). These findings highlight that social change efforts can be thwarted by people's sense of what is possible, but this may be overcome by credibly signaling others' willingness to act collectively.

gender inequality | leadership | politics | bias | social change

Women are underrepresented in positions of formal leadership across a number of domains, including business, education, religion, and government (1–3). In the political realm, although their representation in leadership is at an all-time high, women still make up just 23% of US congressional representatives, 25% of US senators (4), and 25% of representatives in upper and lower houses of parliament around the world (5). Women are even less represented in executive than in legislative roles. Only 6% of current heads of state in the world are women (6), and in more than two centuries of presidential elections, the United States has never elected a woman president. Prior research typically explains this dearth of women leaders as resulting from a discrepancy between people's perceptions and expectations of women on the one hand and their perceptions and expectations of good leaders on the other (7–10). A substantial body of research documents that women are perceived as less legitimate leaders than men (9, 11, 12) and that women who aspire to leadership positions often encounter backlash, hindering their access to leadership positions (10, 13–16).

Perceptions of women as ill-suited for leadership positions are not the only possible barriers to leadership for women, however. We propose that women may also face pragmatic bias, when people withhold support for a member of a group because they believe success is difficult or impossible for members of that group to achieve. Specifically, in electoral contexts,

voters may withhold support for women candidates because they perceive practical barriers to women successfully attaining political leadership positions. As a result of perceived barriers, people may expect that supporting women candidates will ultimately be futile. Significantly, pragmatic bias can reduce support for women candidates even among individuals who do not themselves hold biased perceptions of women's suitability for leadership positions or who even prefer women leaders.

Here, we test whether pragmatic bias impedes women's access to a highly significant political leadership position, the US presidency. We conducted our studies in the context of the 2020 Democratic primary because it featured a large field of candidates who competed for one of the most important leadership positions in the world. In a historic first, it was also the first primary in which there were multiple women candidates with at least minimal support. In this context, voters had to decide not only whether they would like to see one of the women candidates as president but also whether she could defeat Donald Trump in the general election. If pragmatic bias impacts women's access to leadership positions, we would expect that increasing the perceived electability of women candidates also increases the likelihood that Democratic primary voters will vote for a woman to be the presidential nominee.

## Significance

Women remain underrepresented in political leadership in the United States and beyond. While abundant research has studied the possible impact of gender stereotypes on support for women candidates, our research finds that voters also withhold support for women candidates because they perceive practical barriers to women successfully attaining political leadership positions. We find that providing Democratic primary voters with evidence that women earn as much electoral support as men in US general elections increased intentions to vote for women candidates. Our results suggest that women face complex barriers that prevent gender equity in politics, and these barriers can be reduced when voters believe that Americans not only want but also will take action to support women candidates.

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## Personal and Pragmatic Bias

The striking persistence of women's low representation in political leadership has prompted substantial research on its causes. Much of this work has focused on personal bias, which we define as occurring when people withhold support for a member of a group because of their own perceptions of members of that group. Some studies find evidence for personal biases favoring men among American voters (17–20), others do not (21–26). Still, others find evidence for more complex dynamics, such as voters penalizing women only when they do not have children (27) or only when they run for executive office (28).

Here, we study another potential obstacle women candidates face, pragmatic bias, which we define as occurring when people withhold support for a member of a group because they see success to be difficult or impossible for members of that group to achieve. Importantly, women candidates are just one of many groups who can be disadvantaged by pragmatic bias. To illustrate the difference between personal and pragmatic bias, consider the following example: if someone on a hiring committee withheld support for a racial minority job candidate primarily because of their own assumptions about the abilities of members of the racial minority group, that would be an example of personal bias. However, if someone withheld support for the candidate primarily because they assumed others would be unwilling to support a racial minority candidate, that would be an example of pragmatic bias.

The scope of pragmatic bias is limited to settings where individuals decide 1) whether to act to support an individual and 2) may consider the views or actions of others in doing so. Examples of such settings include hiring and promotion decisions, elections, job referrals, and leader selection in organizations. Within this scope, we expect that pragmatic bias will affect outcomes most if there are options to support members of other groups who do not face the same pragmatic concerns (or are advantaged by them) and when concerns regarding the likelihood of success of members of a group exceed actual personal biases. Whereas personal bias is most consequential in settings in which a group is disadvantaged by widely held beliefs about its members' abilities, we expect that pragmatic bias is most consequential in settings in which personal biases have been widely held historically but have waned more recently (e.g., ref. 29). Because it is often difficult to accurately estimate others' beliefs and future actions, people often rely on traditional beliefs as a proxy for what others think, even when most people no longer hold those beliefs (30, 31). As a result, even when individually held beliefs shift, beliefs about what others think and are likely to do can slow social change. In such settings, perceptions of barriers to success may exceed personally held biases, making pragmatic bias a major obstacle to success for members of traditionally disadvantaged groups.

Prior research suggests that pragmatic bias may be a salient concern disadvantaging women and minorities in electoral contexts—particularly in primary elections—in which traditionally underrepresented groups are perceived to be less electable (32, 33). Beyond electoral contexts, there is evidence that people withhold support for women they would otherwise support in nontraditional domains when faced with pragmatic concerns, such as anticipated bias from others (30, 34, 35). More generally, the logic of pragmatic bias is also supported by research on the role of efficacy in collective action settings, which finds that individuals are reluctant to join social movements on issues like climate change, gun control reform, or health care when they believe that the collective effort is unlikely to succeed (36–38).

## Gender and Electability Beliefs

We propose that voters are less likely to support women candidates if they believe that a woman candidate is unlikely to win.

There are a number of reasons why voters might assume women are unlikely to win an election, regardless of their own personal preference for a woman candidate. For example, voters may assume others will view a woman candidate for leadership as unqualified, that others will view her negatively for disrupting traditional gender roles, and/or that she will be subjected to higher standards of evaluation. Where these assumptions are particularly strong, people may expect that supporting women will ultimately be futile.

For pragmatic bias to influence the electoral prospects of women candidates, two propositions must be true. First, voters must think that women are less likely than men to win an election (i.e., women candidates must be perceived as less electable than men candidates). Second, voters' perceptions of the electability of a candidate must influence voters' likelihood to vote for the candidate. If both of these are true, pragmatic bias will impede women's access to political leadership positions. Notably, even those voters who themselves want to see a woman elected might act against that preference because of pragmatic bias.

Prior research provides some evidence supporting these two propositions. Regarding the first proposition, recent studies suggest that voters perceive women candidates to be less electable than men candidates (32, 39–41). Regarding the second proposition, studies featuring a diversity of methods—including preelection polling (42), postelection exit polling (43), and an experimental study of a hypothetical US primary (44)—show that a candidate's perceived electability influences voters in primary elections. In addition, research has demonstrated that “third-order beliefs”—perceptions of what “most people” think—can override individuals' own first-order beliefs when first- and third-order beliefs conflict (30, 45). That research suggests that perceptions of a candidate's electability could outweigh voters' own perceptions of a candidate's other qualities, such as the candidate's policy positions or ideas.

Importantly, while third-order beliefs contribute to pragmatic bias, we propose that pragmatic bias can result from factors other than third-order beliefs that can exert an even more conservative force on social change than third-order beliefs alone do. Whereas third-order beliefs emphasize the importance of what decision makers think others think, pragmatic bias may be driven even more by expectations about what others will do. This distinction is important because it can result in different outcomes. For example, voters who think that a majority of other voters are personally ready for a woman president might still think that these others will not actually vote for a woman candidate if, for example, they think that biased media coverage or sexist treatment by an opponent will dampen the prospects of women candidates' campaigns. In this case, pragmatic bias could still impede voting for a woman, even though third-order beliefs do not. Therefore, to prevent pragmatic bias from impeding the election of a woman, voters must believe not only that a majority of other voters wants a woman candidate to win but that a majority of other voters also will vote for a woman candidate. In that case, voters will perceive the woman candidate as electable, and the effect of pragmatic bias will be attenuated.

Notably, there is evidence that people's concerns that women candidates are unelectable are overly conservative. For example, when women run for congressional office, they are as likely to win general elections as men (46, 47). This is not to say that personal bias against women in politics is a thing of the past. On the contrary, some research suggests that women perform as well as men in general elections in part because only the more qualified women make it to these races, meaning that the similar rates of success of men and women candidates actually reflects gender bias, as the average woman candidate is more qualified than the average man candidate

(48–51). Here, we investigate whether communicating findings about the performance of women candidates in US general elections could be an effective and scalable intervention for reducing the influence of pragmatic bias on women's access to political leadership.

### Empirical Strategy

We test the argument that pragmatic bias impedes women's access to political leadership in six studies in the context of the 2020 Democratic Party presidential primary, a setting in which pragmatic bias against women candidates could have been particularly pronounced and consequential. Democratic voters constitute a group of people who personally support more women in leadership positions (52). However, Democratic voters in 2020 were also very concerned that their chosen candidate could defeat President Donald Trump in the general election (42). Thus, the pragmatic concern that a woman candidate would face practical barriers to the presidency (i.e., be less electable) might result in Democratic primary voters personally favoring a woman candidate but nonetheless voting for a man candidate. We expect that overcoming pragmatic bias requires increasing Democratic primary voters' perceptions that women candidates can win in the general election.

We theorize that the process underlying pragmatic bias is that people use beliefs about what is possible for groups of people in order to infer the viability of specific exemplars of these groups. These beliefs about the viability of specific exemplars of the group then influence people's intentions to support or withhold support for those exemplars. Applied to the context of voting, we define general electability beliefs as voters' beliefs about the electability of women candidates compared to men candidates in general. We define specific electability beliefs as beliefs about the electability of specific women candidates compared to specific men candidates. We propose that voters' general electability beliefs influence their specific electability beliefs. In turn, we propose that voters' specific electability beliefs influence their intentions to vote for the specific candidates.

In the studies that follow, we first test whether voters' perceptions of women as less electable than men are associated with lower intentions to vote for women candidates (Studies 1 and 2), and whether this link is causal (Studies 2, 4, 5, and 6). Second, we identify several dimensions of pragmatic bias that voters report impact women's perceived electability (Study 1). Finally, we test the efficacy of interventions designed to increase voting intentions for women presidential candidates by reducing the perception that women are less electable than men (Studies 3, 4, 5, and 6).

### Results

**Study 1.** First, we examined whether women are perceived as less electable than men and whether these electability beliefs are associated with intentions to vote for a woman candidate. We analyzed responses from a sample of likely Democratic primary voters drawn from a probability sample of US-registered voters designed in partnership with LeanIn.Org ( $n = 984$ ). The survey had three measures of perceived electability. Two measured perceptions of the general electability of women relative to men: a harder for women to win item ("Do you think it will be harder or easier for a woman to win the 2020 election against President Trump, compared to a man?") and a readiness for women item ("How ready do you think most Americans are for a woman president?"). These were averaged to form a composite. A third set of items assessed specific electability perceptions: participants' views of how electable specific women candidates (here, the two women candidates with the most support at the time of the study, Elizabeth Warren and Kamala Harris) were relative to specific men candidates (here,

the two men candidates with the most support at the time of the study, Joe Biden and Bernie Sanders). The measure was calculated as a difference score of the perceived electability of Harris and Warren and the perceived electability of Biden and Sanders.\*

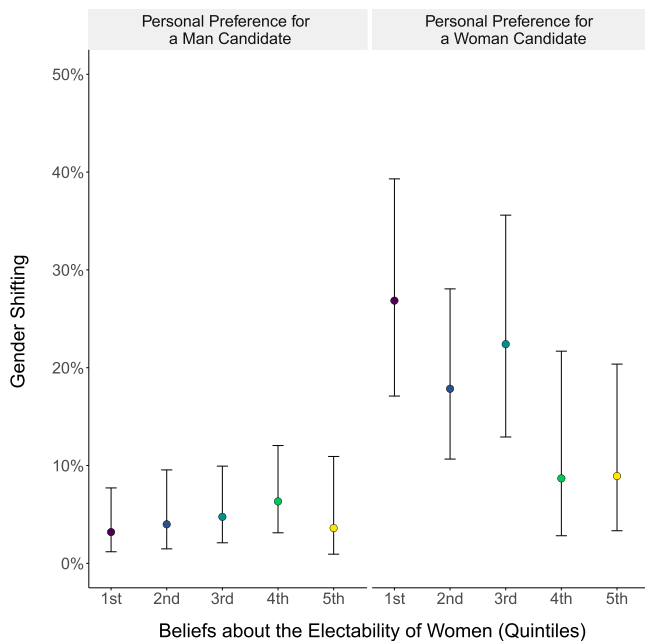
Across these different measures of electability, likely Democratic primary voters consistently believed that women candidates are less electable than men candidates. First, 76% thought that it would be harder for a woman to win the 2020 election against then-president Trump compared to a man, while 16% thought there was no difference, and just 8% thought it would be easier for a woman to win. Second, 42% thought that most Americans were not at all or only slightly ready for a woman president. Another 41% thought that most Americans were moderately ready for a woman president, and only 18% thought most Americans were very or extremely ready for a woman president. Third, 50% thought that Harris and Warren were less electable than Biden and Sanders, whereas 23% thought that the women candidates were equally electable, and 27% thought the women candidates were more electable.

Participants were also asked who they would most want to be the next president if he/she were guaranteed to win (i.e., their "personal preference" candidate) and who they would vote for in the Democratic primary from a list including the highest polling six men and four women candidates at the time of the study. Participants' perceived electability beliefs were consistently associated with participants' intentions to vote for a woman candidate. In logistic regressions controlling for participants' gender, age, race, and education, and the gender of the candidate they reported most wanting to be president, participants' perceptions of women's electability in general, and their perceptions of the electability of the specific women candidates were both positively and significantly associated with intentions to vote for a woman candidate as the Democratic presidential nominee (general electability:  $b = 1.72$ ,  $P = 0.005$ , and average marginal effect [AME] = 12.5%; specific electability:  $b = 3.61$ ,  $P = 0.002$ , and AME = 26.2%). Furthermore, specific electability beliefs partially mediated the association between general electability and intentions to vote for a woman candidate (SI Appendix, Fig. S1).

The association between electability beliefs and voting intentions was driven by participants who most wanted a woman candidate in the presidency if she were guaranteed to win (i.e., who personally preferred a woman candidate) but shifted to a man candidate because they were concerned about the electability of women candidates (Fig. 1).

We define "gender shifting" as intending to vote for a person of a different gender than the gender of the person one personally prefers. Gender shifting occurred more often among participants who most wanted a woman candidate than among participants who most wanted a man candidate:  $b = 1.54$ ,  $P < 0.001$ , and AME = 13.1%. We found evidence that one reason for gender shifting was electability concerns. Among participants who most wanted a woman candidate ( $n = 311$ ), believing that women in general are more electable was negatively and statistically significantly associated with gender shifting:  $b = -2.81$ ,  $P = 0.001$ , and AME = -36.3%. Believing that the specific women candidates are more electable was negatively and marginally significantly associated with gender shifting:  $b = -3.03$ ,  $P = 0.064$ , and AME = -40.3%. Among participants who most wanted a man candidate ( $n = 653$ ), believing that women in general are more electable was not

\*Note that, in this study and those to follow, we consider correlations between general electability perceptions and intentions to vote for women candidates as stronger evidence for pragmatic bias than correlations between specific electability beliefs and support for women candidates, since many additional factors besides gender (e.g., race/ethnicity, policy platform, etc.) likely shape the perceived electability of specific candidates.



**Fig. 1.** The percentage (with 95% CIs) of Democratic primary voters who intended to vote for a candidate of a different gender than the candidate they personally preferred, by 1) gender of the personally preferred candidate, and 2) beliefs about the electability of women to the US presidency.  $N = 653$  respondents who personally preferred a man candidate;  $N = 311$  respondents who personally preferred a woman candidate.

statistically significantly associated with gender shifting:  $b = 0.35$ ,  $P = 0.715$ , and AME = 1.5%, and believing that the specific women candidates are more electable was positively and statistically significantly associated with gender shifting:  $b = 4.16$ ,  $P = 0.013$ , and AME = 17.4%. These results offer initial, correlational evidence consistent with the claim that voters' general beliefs about the electability of women affects their intentions to vote for women and does so, in part, via their perceptions of the electability of those specific women.

Why do likely Democratic primary voters think that women candidates are less electable than men candidates? Respondents who said it would be harder for a woman to win ( $n = 723$ ) identified three categories of disadvantages. First, 91% of these respondents indicated that many Americans are not yet ready to elect a woman president. Second, voters reported that the electability of women candidates is undermined by gender biases in the culture at large, including higher requirements for proving themselves (94%), biased media coverage (77%), and harsher (87%) and more effective (79%) criticisms by political opponents. Third, voters' personal beliefs about women's leadership qualities were also a factor. We found that a sizable minority of voters thought that women lacking the experience required for the presidency (26%) and not being tough enough (25%) were reasons why it would be harder for women to win. These results suggest that electability is a multifaceted construct that includes not only perceptions of others' willingness to vote for women but also concerns about cultural gender biases that could decrease the chances of women candidates.

**Study 2.** In Study 2, we sought to replicate the findings from Study 1 that women candidates are perceived as less electable than men and that these electability beliefs are associated with lower intentions to vote for a woman candidate. We used an Amazon Mechanical Turk sample of likely Democratic primary voters ( $n = 590$ ). We collected general electability beliefs about

men and women candidates (“How much would most Americans like to see a [woman/man] elected president?”). We found that 74% thought that most Americans would prefer to see a man over a woman as president. By contrast, just 16% thought there was no difference and 10% thought that most Americans would prefer to see a woman as president. We also collected specific electability beliefs about Joe Biden and Elizabeth Warren, the man and woman frontrunner at the time of the study (“If it came down to Joe Biden and Elizabeth Warren, who is more likely to beat Donald Trump in the presidential election?”). We found that 55% thought that Biden was more likely to beat then-president Trump than Warren, 18% thought there was no difference, and 27% thought that Warren was more likely to beat then-president Trump than Biden.

We also found that participants' electability beliefs were associated with their intentions to vote for Warren over Biden. Controlling for participants' gender, age, race, education, and their personal voting preference for Warren versus Biden in the linear regression model, perceiving Warren as more electable was strongly and significantly associated with being more likely to intend to vote for Warren:  $b = 0.21$  and  $P < 0.001$ . Perceiving women in general as more electable was also positively associated with being more likely to intend to vote for Warren, though this effect was only marginally significant:  $b = 0.07$  and  $P = 0.093$ . Furthermore, specific electability beliefs mediated the marginally significant association between general electability beliefs and intentions to vote for Warren (SI Appendix, Fig. S2).

As in Study 1, we found evidence that participants who most wanted the woman candidate shifted to the man candidate because they were concerned with the woman candidate's electability. Here, we measure gender shifting as the difference score of personal preference for Warren and voting intentions for Warren, such that values larger than zero indicate a shift in intentions of voting for Biden beyond what would be expected based on personal preference, and values less than zero indicate a shift in the intention of voting for Warren beyond what would be expected based on personal preference. Overall, participants shifted more toward Biden than toward Warren:  $b = 0.04$  and  $P < 0.001$ . We found evidence that one reason for gender shifting was electability concerns. Believing that women in general are more electable was negatively associated with gender shifting, but the effect did not reach statistical significance:  $b = -0.06$  and  $P = 0.107$ , while believing that Warren is more electable was negatively and significantly associated with gender shifting:  $b = -0.04$  and  $P = 0.030$ .

We also provide initial causal evidence for the effect of electability beliefs on voting intentions. We examined if priming the salience of electability decreased participants' intentions to vote for Warren (versus Biden). To test this idea, we leveraged the randomized order of the three questions we asked about participants' personal preference for Warren versus Biden, perceived electability of Warren versus Biden, and intention to vote for Warren versus Biden, categorizing the six order permutations into four salience conditions. In the control condition ( $n = 207$ ), the voting intention question was asked first. In the electability salient condition ( $n = 91$ ), the electability question was asked first, and the voting intention question was asked second. In the personal preference salient condition ( $n = 105$ ), the personal preference question was asked first, and the voting intention question was asked second. In the mixed salience condition ( $n = 187$ ), the voting intention question was asked last. We then regressed participants' intentions to vote for Warren (versus Biden) on a set of dummy variables indicating salience condition, controlling for participants' personal preference for Warren (versus Biden), the perceived electability of Warren (versus Biden), gender, age, race, and education.

We found evidence that making electability salient decreased participants' intentions to vote for Warren (versus Biden). Participants in the electability salient condition were significantly less likely to intend to vote for Warren (versus Biden) than participants in the personal preference salient condition:  $b = -0.06$ ,  $P = 0.002$ , and Cohen's  $d = 0.17$ , or mixed salience condition:  $b = -0.05$ ,  $P = 0.003$ , and Cohen's  $d = 0.14$ . Participants in the electability salient condition were also less likely to intend to vote for Warren (versus Biden) than participants in the control condition, but this effect was only marginally significant:  $b = -0.03$ ,  $P = 0.081$ , and Cohen's  $d = 0.08$ .

The finding that making electability salient decreases participants' intentions to vote for Warren (versus Biden) was also supported by moderation analyses (details in *SI Appendix, Table S1*). We found that the association between the perceived electability of Warren and intentions to vote for Warren was significantly stronger in the electability salient condition than in the three other conditions: all  $b$  values  $> 0.19$  and all  $P$  values  $< 0.011$ . We also found that the association between personal preferences for Warren and intentions to vote for Warren was significantly weaker in the electability salient condition than in the personal preference salient or mixed salience condition: both  $b$  values  $< -0.22$  and both  $P$  values  $< 0.001$ . These findings suggest that making electability salient decreases voters' intentions to vote for candidates who are perceived to be less electable, such as women candidates.

**Study 3.** An important limitation of Studies 1 and 2 is that they do not provide causal evidence that electability beliefs about gender affect voting intentions. The electability salient condition in Study 2 manipulated the salience of each candidate's perceived electability, but there might be reasons unrelated to gender that led voters to perceive Warren as less electable than Biden. In Studies 3, 4, 5, and 6, we address this limitation by testing the efficacy of several interventions designed to increase voting intentions for women presidential candidates by reducing the barrier of perceptions that women in general are less electable than men. These studies were designed to test the causal effect of electability concerns about women candidates, to find interventions that could overcome pragmatic bias, and to identify the mechanisms underlying the potential effects of these interventions.

In Study 3, we tested an intervention that corrected inaccurate beliefs about Americans' readiness for a woman president. We recruited a sample of likely Democratic primary voters from Amazon Mechanical Turk ( $n = 1,385$ ), randomly assigning them to one of three conditions (details in *SI Appendix*). In the true information condition, participants saw a figure showing that 52.5% of voters are very or extremely ready for a woman president. In the misperception condition, participants saw a figure showing that only 15.7% of voters are very or extremely ready for a woman president. In the control condition, participants read general information about the 2020 presidential elections. The percentages shown in the true information condition are based on responses to the question "How ready are you for a woman president?" from the probability sample of US voters used in Study 1 (40), while the percentages shown in the misperception condition reflect the same participants' responses to the question "How ready do you think most Americans are for a woman president?" We collected two dependent variables. Our main dependent variable was participants' intention to vote for a woman candidate, a continuous variable based on voting likelihood ratings of four candidates who led the primary race at the time of the study. We divided the rating for the woman candidate (Elizabeth Warren) by the sum of the ratings for all four candidates (Joe Biden, Pete Buttigieg, Bernie Sanders, and Elizabeth Warren). Our secondary dependent variable was participants' intention to vote for a

woman candidate (binary), a binary variable based on an item that asked participants to choose one candidate they were most likely to vote for. We then conducted linear and logistic regression analyses regressing the dependent variables on treatment condition, controlling for participants' gender, age, race, and education. Where in Studies 1 and 2 we asked participants who their ideal candidate was, we did not in Studies 3 to 6 because we were concerned that asking such a question could suppress treatment effects. Concerns about consistency bias caused by pretreatment measures are common (53, 54). Results from Study 2 suggest that surveying participants' ideal candidate prior to the voting intention question could affect participants' subsequent responses, and we did not want to bias estimates of the effect of the treatment on voting intentions.

We find that merely correcting inaccurate, third-order beliefs about Americans' readiness for a woman president did not increase Democratic primary voters' intentions to vote for a woman candidate. We found that participants in the true information condition were not significantly more likely to intend to vote for a woman candidate than participants in either the control condition:  $b = 0.01$ ,  $P = 0.205$ , and Cohen's  $d = 0.08$ , or the misperception condition:  $b = -0.01$ ,  $P = 0.340$ , and Cohen's  $d = -0.06$ . Because nonsignificant  $P$  values cannot be interpreted as evidence in favor of the null hypothesis, we conducted Bayesian analyses using Jeffreys's Amazing Statistics Program (55, 56) to quantify the evidence in favor of the null hypothesis relative to the alternative hypothesis. Using the default prior (robustness checks with alternate priors are available in *SI Appendix, Figs. S3 and S4*), the Bayes factor provides moderate evidence in favor of a null effect of the true information condition relative to the control condition ( $BF_{01} = 7.19$ ) and strong evidence in favor of a null effect of the true information condition relative to the misperception condition ( $BF_{01} = 10.03$ ). The effect of the true information was also nonsignificant for the binary measure of voting intentions relative to the control condition:  $b = 0.02$ ,  $P = 0.920$ , and AME = 0.3%, and relative to the misperception condition:  $b = -0.27$ ,  $P = 0.070$ , and AME = -5.3%.<sup>†</sup> Interestingly, the true information condition did increase the belief that more Americans are ready for a woman candidate relative to the control condition:  $b = 0.12$ ,  $P < 0.001$ , and Cohen's  $d = 0.59$ , but it did not increase the perceived electability of a specific woman candidate:  $b = 0.01$ ,  $P = 0.257$ , and Cohen's  $d = 0.07$ . This finding is in line with our Study 1 finding that electability perceptions contain more than just third-order beliefs about others' views. Thus, providing Democratic primary voters with information addressing others' readiness for a woman president was insufficient to overcome pragmatic bias. We next test the efficacy of other interventions that were designed to attenuate pragmatic bias more generally by addressing the full range of pragmatic concerns. To do this, we change our focus from shifting voters' perceptions of what other voters think to shifting voters' expectations of what other voters are likely to do.

**Studies 4 to 6.** In Study 4, we examined whether presenting evidence that women earn as much electoral support as men in US general elections would increase the likelihood of voting for a woman presidential candidate. The intervention presented a representative summary of the literature on women's electoral support featuring diverse methodologies, including observational analyses of real-world elections, which show that women

<sup>†</sup>Unexpectedly, we found that participants in the misperception condition were significantly more likely to intend to vote for a woman candidate than participants in the control condition:  $b = 0.02$ ,  $P = 0.026$ , and Cohen's  $d = 0.14$ , although the effect becomes marginally significant when using a Holm-Bonferroni adjustment for multiple hypothesis testing. The difference between participants in the misperception condition and participants in the control condition on the binary measure of voting intentions was marginally significant:  $b = 0.29$ ,  $P = 0.056$ , and AME = 5.6%.

running for office are as likely to win general elections as men running for office (46, 57–60); a recent meta-analysis of 67 survey experiments showing that women candidates receive slightly more support than men candidates (22) and a recent natural experiment on voting for candidates to be primary delegates, which found that women were as successful as men (61). Note that this intervention addresses not only Americans' readiness for a woman president, as the intervention in Study 3 did, but also other possible electability concerns by providing information about the actual electoral success of women candidates.

To test the intervention, we recruited a sample of likely Democratic primary voters from Amazon Mechanical Turk ( $n = 1,475$ ). Because including information about persistent bias against women in politics could undermine the effect of the treatment (if it brought to mind barriers facing women) or strengthen the treatment (if it seemed more believable), we tested the effects of two treatments—one that did not include this information and another one that did. Participants were randomly assigned to one of three conditions: a women electable condition, in which participants read a summary of research findings suggesting that women and men candidates are equally electable (22, 51, 61); a women electable but disadvantaged condition, in which participants read the same text but with an additional paragraph explaining that women still face barriers in politics; or the control condition, in which participants read general information about the 2020 presidential elections (details in *SI Appendix*). We used the same measures of intentions to vote for women candidates as in Study 3.

Studies 5 and 6 were designed to replicate the effects found in Study 4, with minor design modifications to assess the robustness of the effect. Study 5 ( $n = 459$ ) was the same as Study 4, except it measured intentions to vote for both Amy Klobuchar and Elizabeth Warren as women candidates and only included the control and women electable but disadvantaged conditions. Study 6 ( $n = 3,002$ ) included all three conditions, measured views of Klobuchar and Warren, was conducted on a nationally representative sample, and tested a preregistered hypothesis with a preregistered analysis script (<https://osf.io/rvhtf/>) (62). Because the women electable condition and the women electable but disadvantaged condition are conceptually similar and because we found no significant differences between the two conditions in any study, we collapsed them into a combined electability boost condition. This decision was preregistered for Study 6 and is used in the analyses below.

**Main analysis.** As illustrated in Fig. 2, Studies 4 to 6 consistently showed that presenting evidence that women earn as much electoral support as men in US general elections increases the likelihood of intending to vote for a woman presidential candidate:  $b$  values = 0.03, 0.05, and 0.03;  $P$  values < 0.001, 0.005, and < 0.001; and Cohen's  $d$  values = 0.20, 0.25, and 0.14.

A meta-analytic estimate across these studies based on linear mixed-effects models clustering at the study level (as recommended by refs. 63 and 64) suggests that participants in the electability boost conditions were significantly more likely to intend to vote for the women candidates than participants in the control condition:  $b = 0.03$  and 95% CI = [0.02, 0.04]. This effect size indicates that the electability boost interventions led to 3% higher intentions to vote for a woman candidate, as compared to the control condition. Thus, the electability boost interventions reliably increased intentions to vote for a woman candidate. While the observed effect size is small, it is worth considering in light of the small margins observed in many US primary and general elections.

**Secondary dependent variable.** Results were similar, though less consistent, for the binary measure of voting intentions. We found significant effects in Studies 4 and 5 but a nonsignificant effect in Study 6:  $b$  values = 0.34, 0.61, and 0.04;  $P$  values = 0.011, 0.010, and 0.684; and AMEs = 6.1%, 9.9%, and 0.6%. It

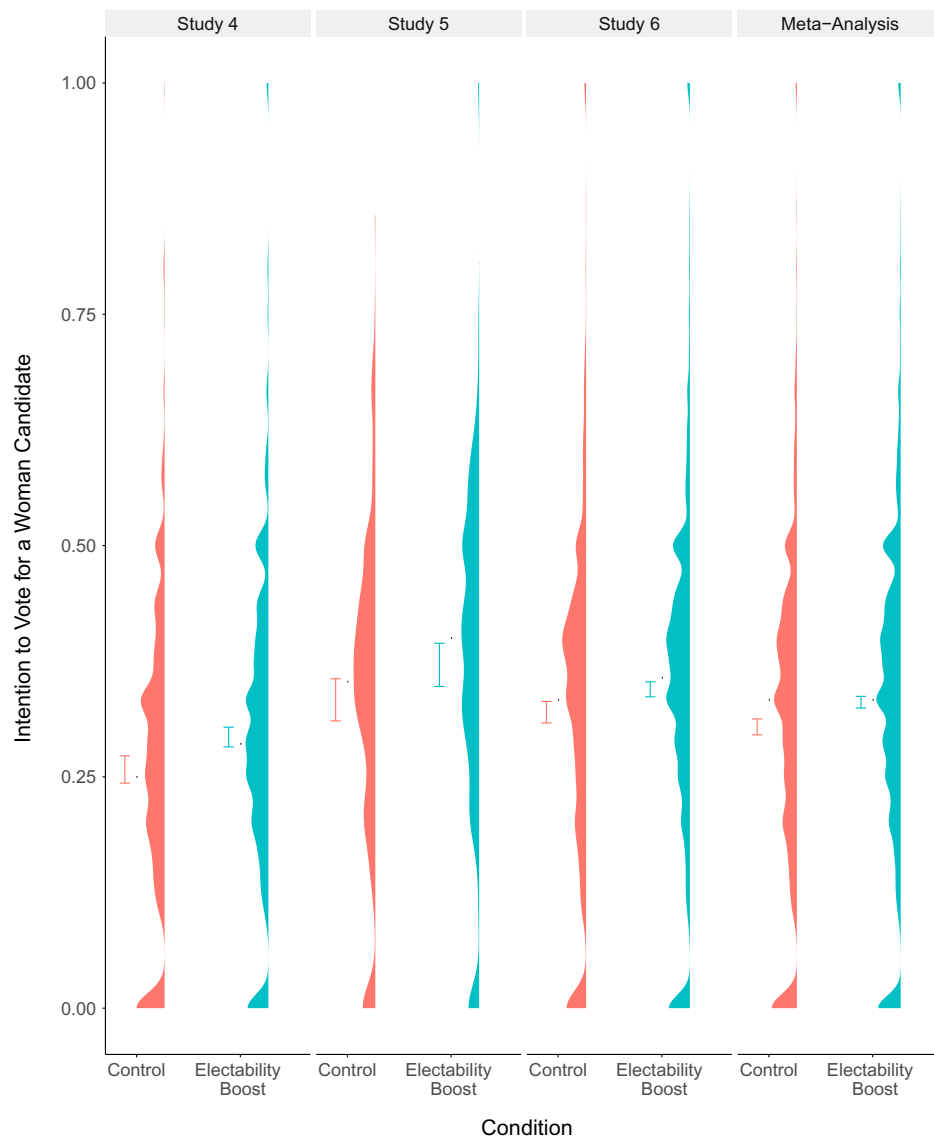
is possible that we did not detect an effect on the dichotomous measure in Study 6 because participants were less attentive in this nationally representative sample than the panel of prescreened Amazon Mechanical Turk workers we sampled from in Studies 4 and 5. Alternatively, our power analyses were based on the continuous dependent variable, so we may have been underpowered to detect an effect on a dichotomous dependent measure. Consistent with this, we do find the effect on the dichotomous dependent measure in the better-powered meta-analysis. A meta-analytic estimate across these studies based on logistic, mixed-effects models clustering at the study level finds that participants in the electability boost conditions were significantly more likely to intend to vote for a woman candidate than participants in the control condition:  $b = 0.18$  and  $P = 0.013$ . In a linear probability model predicting binary vote choice, the effect size indicates that the electability boost treatments led to 3% higher intentions to vote for a woman candidate, as compared to the control condition, similar to the results for the continuous measure of likelihood to vote for a woman. Thus, these analyses provided additional support for the effectiveness of the electability intervention, though effects were more robust for the more fine-grained, continuous measure of voting intentions than for the dichotomous measure.

**Durability.** Did the intervention produce durable effects? To examine this question, we recontacted all participants from Study 4 to participate in a follow-up study. We recruited 72% ( $n = 1,066$ ) of the original participants to participate in the follow-up study, 22 to 40 d after the original study (average time difference was 29 d). Participants in the electability boost conditions were more likely to intend to vote for a woman candidate than participants in the control condition using the binary measure of voting intentions:  $b = 0.31$ ,  $P = 0.048$ , and AME = 5.6%. A similar, but nonsignificant, effect was found using the continuous measure:  $b = 0.02$ ,  $P = 0.192$ , and Cohen's  $d = 0.08$ . Thus, we found some evidence that the electability boost interventions could durably increase participants' intentions to vote for a woman candidate ~1 mo after the original study.

**Mediation analyses.** How did the electability boost condition increase participants' intentions to vote for a woman candidate? Here, we report meta-analytic estimates and focus on the two mediators that were measured in Studies 4 to 6: 1) participants' perceived electability of women candidates in general and 2) participants' perceived electability of specific woman candidates. Results for the individual experiments are reported in *SI Appendix, Figs. S5–S7*.

As an initial step, we tested whether the two potential mediators were affected by the manipulation. We found that participants in the electability boost conditions perceived women candidates in general as more electable than participants in the control condition did:  $b = 0.04$  and 95% CI = [0.03, 0.05]. Participants in the electability boost conditions also perceived the specific women candidates as significantly more electable than participants in the control condition did:  $b = 0.01$  and 95% CI = [0.01, 0.02]. Thus, both potential mediators were affected by the manipulation. As a final step, we used a bias-corrected bootstrap estimation approach with 5,000 samples to estimate the mediation effects (Fig. 3).

We found that part of the effect operated only via specific electability beliefs:  $b = 0.01$  and 95% CI = [0.002, 0.01]. Another part of the effect operated via both general electability beliefs and specific electability beliefs:  $b = 0.003$  and 95% CI = [0.002, 0.004]. The indirect effect via general electability beliefs was not significant:  $b = -0.001$  and 95% CI = [-0.002, 0.0004]. The direct effect of the electability boost conditions, compared to the control condition, remained significant:  $b = 0.02$  and 95% CI = [0.01, 0.03]. Thus, these mediation analyses are consistent with the idea that the effect operated in part via both



**Fig. 2.** Intention to vote for a woman candidate depending on condition in Studies 4 to 6 and in an internal meta-analysis of the three studies. (*Left*) Plots show the mean and 95% CI. (*Middle*) Plots show the distribution of data points. (*Right*) Plots show all data points.  $N = 1,475$  for Study 4;  $N = 459$  for Study 5;  $N = 3,002$  for Study 6;  $N = 4,936$  for Meta-Analysis.

general and specific electability beliefs, though mediation analyses do not allow conclusions about the causal effect of mediators on dependent variables.

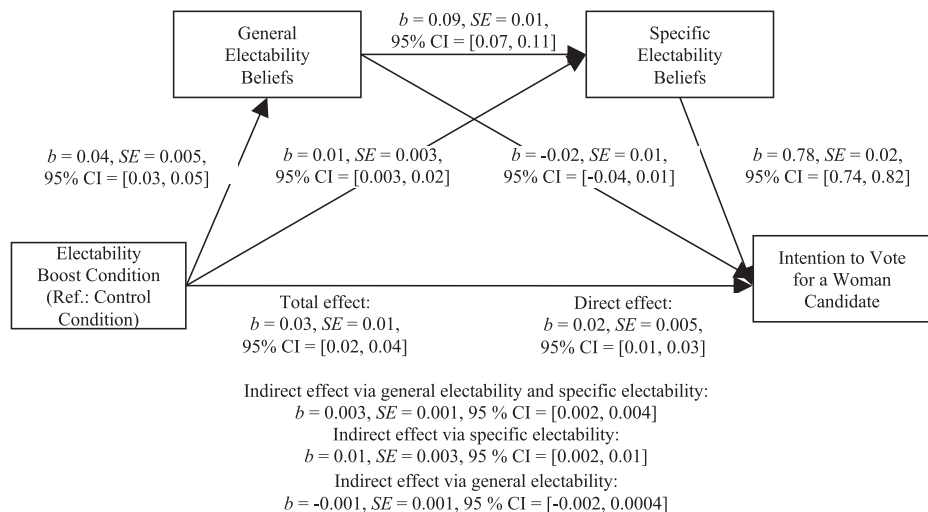
**Moderation analyses.** Moderation analyses suggest that the electability boost conditions were not significantly moderated by participants' reported levels of importance of winning the election, importance of electing a woman president, or sexism.

## Discussion

Our research suggests that pragmatic bias—the withholding of support for members of groups for whom success is perceived to be difficult or impossible to achieve—hinders women's access to political leadership, specifically election to the US presidency. Here, we leveraged the unique field of candidates in the 2020 Democratic presidential primary election to study the viability of multiple women candidates versus multiple men candidates, a historic opportunity to explore the effects of gender bias in a US presidential election. Studies 1 and 2 extend prior research by showing that voters who personally preferred

women candidates were more likely to “gender shift” toward voting for a man when they viewed women candidates as less electable. However, these studies do not provide evidence that the relationship between electability beliefs about women and voting intentions is causal. To address this, we conducted several experiments. Across Studies 4 to 6, including one preregistered experiment with a nationally representative sample, we found that electability boost interventions increased Democratic primary voters' intentions to vote for a woman presidential candidate. Furthermore, we find treatment effects on perceptions of the electability of women in general, suggesting that the treatments are not limited to particular women candidates.

An internal meta-analysis of Studies 4 to 6 found that both the women electable and the women electable but disadvantaged conditions significantly increased intentions to vote for a woman candidate. While the effect of the women electable but disadvantaged condition was slightly stronger, there was no significant difference between the two conditions (details in *SI Appendix, Table S2*), offering practitioners who might seek to intervene on this problem multiple means for doing so, both



**Fig. 3.** The effect of the electability boost condition on the intention to vote for a woman candidate as mediated by general and specific electability beliefs in Studies 4 to 6. Note that all tests are based on linear mixed-effects models. All models include participants' gender, age, race, and education as control variables. Indirect effects are based on bias-corrected bootstrapping with 5,000 samples.  $N = 4,931$ .

based in the literature with differing degrees of nuance. Other ineffective treatments—including the treatments in our Study 3 and in other work (32)—suggest that successfully reducing the influence of gender-based electability beliefs on people's voting intentions is not trivial. In Study 4, we also find suggestive evidence of the durability of the effect, despite the treatment being a very short, single exposure and a month earlier. The significant treatment effects in Studies 4 to 6—especially the effect in the well-powered Study 6 on a nationally representative sample following a preregistered analysis script—is the strongest evidence yet documented for the existence of a causal effect of gender bias in electability beliefs on voting intentions. Studies 4 and 5—although not preregistered—provide convergent evidence using the same analytical procedures in analyzing the data as in the preregistered study.

Our research also illustrates the many barriers women face that contribute to pragmatic bias. In Study 1, respondents cited many reasons why women were less electable than men, most prominently the belief that Americans are not ready to elect a woman president. However, the null effect of the intervention in Study 3 suggests that neutralizing pragmatic bias may require more than merely correcting perceptions of others' attitudes; it may require shifting perceptions of others' likely behavior (Studies 4 to 6). While beliefs about others' attitudes and beliefs about others' behaviors are distinguishable concepts, future research should measure these concepts to evaluate whether the distinction matters beyond our experimental studies. Further research is needed because there are other aspects of the Study 3 manipulation that might have made it inefficacious (in particular, the relatively small majority of Americans reporting they are "very ready" or "extremely ready" for a woman president). More research is also needed to definitively establish all mechanisms driving the effects of the electability boost interventions. The indirect effects identified in the exploratory meta-analysis were small, and not every effect in the model was consistent across all studies (*SI Appendix, Figs. S5–S7*). Furthermore, the direct effect of the interventions remained significant in the mediation analysis, suggesting that other mechanisms may be at work.

In addition, future research is needed to identify variables moderating the effects of pragmatic bias. In the political domain, we speculate that pragmatic bias is more likely to occur at the qualifying stage of an election, in pregeneral election fundraising, in a primary election, or in a race that could go to a runoff. We

also expect that pragmatic bias is likely to be most impactful for executive positions—governorships and the presidency—and less so for other positions—legislative and council seats—since the former are more clearly at odds with traditional gender stereotypes and representation in these positions has historically been lower for women (28, 65; but see also ref. 24).

Future work could also examine whether the electability boost intervention tested here might be effective for counteracting other barriers to achieving gender parity among elected representatives: gender differences in willingness to run for higher office (66), the tendency for women candidates to attract more competition in primaries (50), and women candidates being less likely to be recruited to run for office (67, 68). Finally, women are underrepresented in positions of formal leadership not only in politics but across a number of domains (1–3), and the perception of practical barriers may impede women's access to leadership positions in business, education, and religion as well.

Social change is notoriously difficult to achieve. We have presented evidence that pragmatic bias can be an obstacle to social change. We find that to overcome this particular form of pragmatic bias, it is not enough to believe that most Americans are ready for a woman president; they must also believe that others will act on that readiness and vote accordingly. More broadly, this research highlights an important way by which longstanding inequalities may be reproduced: Their historical persistence leads people to assume that collective action will be futile, even when a majority prefers social change. On a more hopeful note, results also highlight the malleability of this perception-based barrier to change, suggesting the potential for scalable interventions that could stimulate social change by shifting beliefs about what is possible.

## Methods

**Ethics Statement and Reproducibility.** All studies were approved by the Institutional Review Board at Stanford University. All participants provided informed consent. Materials, anonymized data (including descriptions of how the original files were anonymized), and analysis code for Studies 1 to 6 are available via <https://osf.io/ymjwx/>. The preregistration for Study 6 is available at <https://osf.io/rvhtf/>. We report all studies that we conducted in this research program in this paper.

**Study 1.** We surveyed a probability sample of 2,052 US-registered voters using the Ipsos KnowledgePanel (see ref. 40). We restricted the sample to likely Democratic primary voters (exclusion rules and sample demographics are available in *SI Appendix, Tables S3 and S4*). Because we found a surprisingly



high number of participants who indicated they would vote in the Democratic primaries but did not intend to vote for the Democratic candidate in the general election, we only included participants who reported they would also vote for the Democratic candidate in the general election ( $n = 984$ ). Results are substantively identical if this criterion is relaxed (*SI Appendix, Tables S5–S7*). According to sensitivity power analyses conducted with G\*Power (69), the sample size provides us with 95% power to detect correlations of  $r \geq 0.11$ . In all studies, we only asked about candidates whose campaigns were active. In Study 1, participants chose the candidate they would vote for in the Democratic primary if their state's primary were being held the next day from a list of the top-polling six men and four women candidates running for the Democratic Party nomination at the time of the study. Participants chose their "personal preference" candidate from the same list plus two other options: "Donald Trump" and "Other."

General electability beliefs were measured with two items. The first item, "Do you think it will be harder or easier for a woman to win the 2020 election against President Trump compared to a man?" was measured on a seven-point scale from "Much harder for a woman to win" to "Much easier for a woman to win." The second item, "How ready do you think most Americans are for a woman president?" was measured on a five-point scale from "Not at all ready" to "Extremely ready." The two items were averaged to form a composite ( $r_{\text{Spearman-Brown}} = 0.52$ ) (70). This is the measure shown in Fig. 1. Results are substantively similar if the two general electability items are analyzed separately, though the "harder to win" measure consistently has weaker significance levels (*SI Appendix, Tables S5–S7*). Specific electability beliefs were measured for the two women and two men candidates with the most support at the time of the study (Kamala Harris, Elizabeth Warren, Joe Biden, and Bernie Sanders), with the item "How electable is [candidate]?" on a five-point scale from "Not at all electable" to "Extremely electable." The measure was calculated as  $(\text{Harris} + \text{Warren})/2 - (\text{Biden} + \text{Sanders})/2$  and recoded to range from 0 to 1. Intentions to vote for a woman candidate were measured with the item "If these were the remaining candidates, who would you vote for?", and 10 choices were provided (Joe Biden, Cory Booker, Pete Buttigieg, Julián Castro, Kirsten Gillibrand, Kamala Harris, Amy Klobuchar, Beto O'Rourke, Bernie Sanders, and Elizabeth Warren). This measure was recoded into two categories: intending to vote for a man candidate and intending to vote for a woman candidate. The gender of the candidate participants reported most wanting to be president was measured with the item "If he/she were guaranteed to win, who would you most want to be the next president?", and 12 choices were provided (Joe Biden, Cory Booker, Pete Buttigieg, Julián Castro, Kirsten Gillibrand, Kamala Harris, Amy Klobuchar, Beto O'Rourke, Bernie Sanders, Donald Trump, Elizabeth Warren, and Other). This measure was recoded into three categories: wanting a man candidate, wanting a woman candidate, and unknown. Research shows that prospective surveys of voting intentions are broadly predictive of actual voting, though analyses are mostly conducted at the aggregate as opposed to individual level (71).

In *Results*, we report weighted descriptive statistics to account for an oversampling of Black and Latinx voters in the Study 1 survey. The descriptive statistics are very similar when unweighted (*SI Appendix, Tables S8 and S9*). In our regression analyses, we controlled for participants' gender, age, race, and education. We also controlled for the gender of the candidate participants reported most wanting to be president, since this factor could influence both perceived electability (via a motivated reasoning process or "halo effect") and intention to vote for a woman candidate.

**Study 2.** We recruited US residents from a large panel of previously surveyed Amazon Mechanical Turk workers. We restricted the sample to likely Democratic primary voters ( $n = 590$ ; exclusion rules and sample demographics are available in *SI Appendix, Tables S3 and S4*). The sample size provides us with 95% power to detect correlations of  $r \geq 0.15$ .

We asked participants about the most supported man (Biden) and woman (Warren) candidate at the time of the study. Participants were surveyed twice with a time lag of  $\sim 2$  wk, and only data from respondents who participated in both surveys were used in our analyses. As part of the first survey, general electability beliefs were measured with two items. The first item, "How much would most Americans like to see a woman elected president?", was measured on a five-point scale from "Not at all" to "A great deal." The second item, "How much would most Americans like to see a man elected president?", was measured on the same five-point scale. The measure was calculated as a difference score (perceived electability of women minus perceived electability of men) and recoded to range from 0 to 1. As part of the second survey, specific electability beliefs were measured with the item "If it came down to Joe Biden and Elizabeth Warren, who is more likely to beat Donald Trump in the presidential election?" on a seven-point scale from "Joe Biden is a great deal more likely to beat Donald Trump" to "Elizabeth Warren is a

great deal more likely to beat Donald Trump." The measure was recoded to range from 0 to 1. Intentions to vote for a woman candidate were measured with the item "If the Democratic presidential primary in 2020 came down to Joe Biden and Elizabeth Warren, for whom would you vote? The winner of the Democratic presidential primary will run against Donald Trump in the 2020 general presidential election." On a seven-point scale from "Definitely vote for Joe Biden" to "Definitely vote for Elizabeth Warren." Personal preference was measured with the item "If it came down to Joe Biden and Elizabeth Warren, who would you make president if your vote alone would determine who was elected?" and on a seven-point scale from "Definitely vote for Joe Biden" to "Definitely vote for Elizabeth Warren." The order of the specific electability item, the voting intention item, and the personal preference item was randomized. In our linear regression analyses for estimating the association between participants' electability beliefs and their intentions to vote for a woman candidate, we controlled for participants' personal preferences as well as participants' gender, age, race, and education. In our linear regression analyses for estimating the association between participants' electability beliefs and their intentions to gender shift, we controlled for participants' gender, age, race, and education. In our linear regression analyses for estimating the treatment effects of salience condition, we controlled for participants' specific electability beliefs; personal preferences; as well as participants' gender, age, race, and education. Treatment effects are weaker in a robustness check that does not control for participants' specific electability beliefs and personal preferences (*SI Appendix, Table S10*).

**Study 3.** We recruited US residents from a large panel of previously surveyed Amazon Mechanical Turk workers. We restricted the sample to likely Democratic primary voters ( $n = 1,385$ ; exclusion rules and sample demographics are available in *SI Appendix, Tables S3 and S4*). The sample size provides us with 95% power to detect treatment effects of Cohen's  $d \geq 0.24$ . For Studies 3 and 4, we asked participants about Joe Biden, Pete Buttigieg, Bernie Sanders, and Elizabeth Warren, the most viable women and men candidates at the time of each study.

As described in *Results*, participants were randomly assigned to one of three experimental conditions: the true information condition, in which participants saw a figure showing that 52.5% of voters are very or extremely ready for a woman president; the misperception condition, in which participants saw a figure showing that only 15.7% of voters are very or extremely ready for a woman president (the 15.7% differs from the 18% presented in *Results* for Study 1 because respondents with missing data were removed from the Study 1 sample before the current analysis was conducted but after Study 3 was run); or the control condition. The full text of what participants saw in each condition is available in *SI Appendix*. Next, we measured participants' intentions to vote for each candidate with the item "If the Democratic primary/caucus were being held in your state tomorrow, and these were the remaining candidates, how likely would you be to vote for each of them?" on a five-point scale from "Not at all likely" to "Extremely likely." Intentions to vote for a woman candidate were calculated as  $\text{Warren}/(\text{Biden} + \text{Buttigieg} + \text{Sanders} + \text{Warren})$ . A problem with this measure is that it is undefined for participants who are not at all likely to vote for any of these candidates, resulting in a smaller sample. Because we preregistered this strategy in Study 6, we present the results for this measure in the manuscript. Across Studies 3 to 6, results using the preregistered strategy are nearly identical in robustness checks using different measurement strategies (*SI Appendix, Tables S11–S14*).

We also collected a binary measure of intentions to vote for a woman candidate by asking "If the Democratic primary/caucus were being held in your state tomorrow, and these were the remaining candidates, for which ONE would you vote?" with five choices (Joe Biden, Pete Buttigieg, Elizabeth Warren, Bernie Sanders, and Other [with a textbox]). This measure was recoded into two categories: intending to vote for a woman candidate and not intending to vote for a woman candidate. General electability beliefs were measured with the item "How would most Americans feel about electing a woman president?" on a seven-point scale from "Very negatively" to "Very positively." Specific electability beliefs were measured for Joe Biden, Pete Buttigieg, Bernie Sanders, and Elizabeth Warren with the item "If nominated, how likely is it that [candidate] would win against Donald Trump in the 2020 presidential election?" on a five-point scale from "Not at all likely" to "Extremely likely." The measure was calculated as  $\text{Warren} - (\text{Biden} + \text{Buttigieg} + \text{Sanders})/3$  and recoded to range from 0 to 1. In our regression analyses, we controlled for participants' gender, age, race, and education. At the end of the survey, participants in the "misperception" condition were debriefed and informed that the results they had seen were not accurate.

**Study 4.** We recruited US residents from a large panel of previously surveyed Amazon Mechanical Turk workers. We restricted the sample to likely Democratic primary voters ( $n = 1,475$ ; exclusion rules and sample demographics are

available in *SI Appendix, Tables S3 and S4*). The sample size provides us with 95% power to detect treatment effects of Cohen's  $d \geq 0.20$ .

As described in *Results*, participants were randomly assigned to one of three experimental conditions: the women-electable condition, the women-electable but disadvantaged condition, or the control condition. The full text of what participants saw in each condition is available in *SI Appendix*. We collected the same measures of intentions to vote for a woman candidate, intentions to vote for a woman candidate (binary), general electability beliefs, and specific electability beliefs as in Study 3. In our regression analyses, we controlled for participants' gender, age, race, and education.

We recontacted all participants in our final sample of Study 4 to participate in a follow-up study. We retained 72% ( $n = 1,066$ ; exclusion rules and sample demographics are available in *SI Appendix, Tables S3 and S4*) of the original participants who participated in the follow-up study 22 to 40 d after the original study (average time difference was 29 d). We collected the same measures of intentions to vote for a woman candidate, intentions to vote for a woman candidate (binary), and specific electability beliefs as in the original study.

**Study 5.** We recruited US residents from a large panel of previously surveyed Amazon Mechanical Turk workers. We restricted the sample to likely Democratic primary voters ( $n = 459$ ; exclusion rules and sample demographics are available in *SI Appendix, Tables S3 and S4*). The sample size provides us with 95% power to detect treatment effects of Cohen's  $d \geq 0.34$ . For Studies 5 and 6, we asked participants about the same candidates as Studies 3 and 4, with the addition of Amy Klobuchar because she was the second highest polling woman candidate at the time, allowing us to test the robustness of the effect to multiple woman candidates.

As described in *Results*, participants were randomly assigned to one of two experimental conditions: the women-electable but disadvantaged condition or the control condition. The full text of what participants saw in each condition is available in *SI Appendix*. We collected the same measures of intentions to vote for a woman candidate, intentions to vote for a woman candidate (binary), and specific electability beliefs as in Study 3. General electability beliefs were measured with the item "Do you think it is harder or easier for a woman to win a US presidential election compared to a man?" on a seven-point scale from "Much harder for a woman to win" to "Much easier for a woman to win." In our regression analyses, we controlled for participants' gender, age, race, and education.

**Study 6.** We recruited likely Democratic primary voters from a panel maintained by Bovitz Inc. that is representative of the US population with respect to key demographics (see ref. 72). The final sample size was  $n = 3,002$  (exclusion rules and sample demographics are available in *SI Appendix, Tables S3 and S4*). The sample size provides us with 95% power to detect treatment effects of Cohen's  $d \geq 0.14$ .

As described in *Results*, participants were randomly assigned to one of three experimental conditions: the women-electable condition, the women-electable but disadvantaged condition, or the control condition. The full text of what participants saw in each condition is available in *SI Appendix*. We collected the same measures of intentions to vote for a woman candidate, intentions to vote for a woman candidate (binary), and specific electability beliefs as in Study 5. General electability beliefs were measured with two items. The first item, "Do you think it is harder or easier for a woman to win a US presidential election compared to a man?", was measured on a seven-point scale from "Much harder for a woman to win" to "Much easier for a woman to win." The second item, "How would most Americans feel about electing a woman president?", was measured on a seven-point scale from "Very negatively" to "Very positively." The two items were averaged to form a composite ( $r_{\text{Spearman-Brown}} = 0.45$ ). In our regression analyses, we controlled for participants' gender, age, race, and education.

We conducted meta-analyses across Studies 4 to 6. We used linear mixed-effects models clustering at the study level (as recommended by refs. 63 and 64). We controlled for participants' gender, age, race, and education.

In all studies, we measured additional variables that are not relevant for answering the research questions of this paper. The questionnaires for all studies are available via <https://osf.io/ymjwx/>.

**Data Availability.** Anonymized data, code, materials, and preregistration data have been deposited in the Open Science Framework (OSF) (<https://osf.io/ymjwx/>) (73). The preregistration for Study 6 is available at OSF <https://osf.io/rvhtf/> (62). All other study data are included in the article and/or *SI Appendix*.

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