Group Size and Its Impact on Diversity-Related Perceptions and Hiring Decisions in Homogeneous Groups

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Abstract

Why do some homogeneous groups face backlash for lacking diversity, while others escape censure? We propose and show that a homogenous group's size changes the way it is perceived and whether decision makers pursue greater diversity in its ranks. We theorize that people make different inferences about larger groups than smaller ones—with downstream consequences for diversity management—due to Bayesian reasoning. Because each member of a group represents the outcome of a hiring decision, larger homogeneous groups signal a diversity problem more strongly than smaller homogeneous groups. We test our theory across three pre-registered experiments (N=4,283), showing that decision-makers are more likely to diversify larger homogeneous groups than smaller ones, and that larger homogeneous groups are viewed as (i) more likely to have resulted from an unfair selection process; (ii) less diverse; (iii) more likely to face diversity-related impression management concerns; and (iv) less open to the influence of newly added underrepresented group members. Further, (i)-(iii) mediate the relationship between homogeneous group size and decisions to diversify a group. We extend our findings to the field with a study of S&P 1500 corporate boards, showing that larger homogeneous boards are more likely to add women or racial minorities as new directors. Larger all-male boards and all-White boards are also significantly rarer than expected, suggesting that decision-makers work especially hard to diversify larger homogeneous groups. Our findings highlight how group size shapes diversity-related perceptions and decisions and shed light on mechanisms that kickstart diversification efforts in homogeneous groups.

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Homogeneous groups—those whose members belong to a single demographic category—are still common in many organizations despite the benefits of diversity (Herring, 2009; Homan, Buengeler, Eckhoff, van Ginkel, & Voelpel, 2015; McKay, Avery, & Morris, 2009; Richard, Murthi, & Ismail, 2007). As of 2020, 25% of Fortune 100 C-Suites were all-White and 9% were all-male (Larcker & Tayan, 2020). Similarly, 38% of S&P 1500 corporate boards were all-White and 8% were all-male in 2018 (Institutional Shareholder Services, 2019). And a recent global analysis of professional speakers from 2013-2018 found that 69% were male, which may explain why many events still feature all-male panels, or "manels" (Bouvy & Mujoomdar, 2019; Else, 2019; Kumar, 2018). With so little diversity in many influential and visible groups despite strong pressure to diversify and reap the associated benefits, it is important to better understand what kickstarts diversity efforts in homogeneous groups (Cutter, 2020; Duarte, 2020).

We explore a feature of homogenous groups that we theorize can change the way they are perceived and whether they are diversified—their size. Consider an example of two law firms: in 2018, the firm *Paul, Weiss* faced backlash and public condemnation after announcing its new, all-White partner class, which included a single White woman and otherwise consisted only of White men (Scheiber & Eligon, 2019). The announcement landed the firm on the front page of the *New York Times* and made *Paul, Weiss* the face of diversity problems in 'Big Law' (Patrice, 2018; Scheiber & Eligon, 2019; Simmons, 2018). Around the same time, another law firm, *Pryor Cashman*, announced an even more homogeneous partner class—one that included only White men and no women (Pryor Cashman, 2017). However, *Pryor Cashman* did not face any censure. Why did these firms' announcements produce such different public reactions? There are many possible explanations for this discrepancy, including luck or coincidence. But one potentially relevant difference between the two law firms' partner classes is in their sizes: *Paul, Weiss* named 12 new partners, while *Pryor Cashman* named just 4.

Size is a fundamental and visible attribute of any organizational group or team. Although prior diversity scholarship treats homogenous groups as indistinct from one another regardless of size (Harrison & Klein, 2007; Meyer, 2017), we highlight the role a homogeneous group's size plays in shaping (i) the

way it is perceived, (ii) whether it will subsequently be diversified, and (iii) how aggressively decision-makers pursue its diversification. In doing so, we also identify several psychological mechanisms that underlie kickstarting diversification efforts in homogeneous teams.

We draw upon a core tenet of judgment and decision-making theory—that people tend to form beliefs in an intuitive Bayesian manner (Dawes, 1989; Gigerenzer & Hoffrage, 1995; Moore & Healy, 2008; Slovic & Lichtenstein, 1971)—and propose that the size of a homogeneous group can play an important role in shaping how people perceive its diversity, and, more importantly, how people act in response to these perceptions. According to a standard Bayesian framework, people use the information they observe to generate statistically informed guesses about the likelihood of different possibilities, which shape their beliefs and inform their actions (Green & Daniels, 2021; Slovic & Lichtenstein, 1971). For example, logic suggests that a larger homogeneous group is less likely, statistically, to be the product of an unbiased hiring and retention process than a smaller homogeneous group. Therefore, a logical (Bayesian) observer should interpret a larger homogeneous group as providing a stronger signal that there is a diversity problem, relative to a smaller homogeneous group (Bohnet, van Geen, & Bazerman, 2016). This could help explain why an all-White and primarily male 12-person partner class would generate more outrage than a partner class of 4 White men: the homogeneity of the larger class objectively contains a stronger signal of a diversity problem than that of the smaller class.

Based on this theorizing, we posit that larger homogeneous groups will be perceived as being (i) more likely to have formed through an unfair selection process; (ii) less diverse; (iii) more likely to face diversity-related impression management concerns; and (iv) less capable of being influenced by newly added group members than smaller homogeneous groups. We expect each of these perceptions to influence diversity-related hiring decisions, such that decision-makers will be more prone to diversify larger homogeneous groups than smaller ones. Our theorizing also suggests that large homogeneous groups will be surprisingly underrepresented in real organizations because decision-makers will work particularly aggressively to diversify larger homogeneous groups. Specifically, we theorize that because decision-makers are more likely to register and react to a lack of diversity in larger homogeneous groups

than smaller ones, organizations will strategically invest disproportionate effort towards diversifying larger homogeneous groups than smaller ones. This should lead to a relative scarcity of larger homogeneous groups (vs. smaller ones) compared to the chance rate at which they would be expected to be observed in organizations.

To test these predictions, we present evidence from three pre-registered experiments and a field study. We first present results from a series of experiments to establish a causal relationship between homogeneous group size and diversity-related hiring decisions and perceptions. These experiments provide initial support for our theory. Next, we present an analysis of S&P 1500 corporate board composition data, which demonstrates that our theorizing predicts patterns of group composition in a consequential organizational setting.

Our theory and findings improve our understanding of when and why organizations exert effort to diversify homogeneous groups. Research on intergroup contact suggests that interactions with outgroup members can help reduce prejudice, while other work finds that exposure to counter-stereotypical exemplars can reduce implicit bias and help people overcome stereotypes (Finnegan, Oakhill, & Garnham, 2015; Lai, Hoffman, & Nosek, 2013; Paluck, Green, & Green, 2019; Robertson & Weiss, 2017). Since diversifying homogeneous groups creates opportunities for intergroup contact and can facilitate exposure to counter-stereotypical exemplars, better understanding the forces that lead homogeneous groups to diversify may be particularly important for reducing bias and accelerating diversification efforts in organizations more broadly. In addition, previous work suggests that homogeneity itself can exert distinct and negative effects on groups, with implications for prejudice, discrimination, and intergroup conflict (Apfelbaum, Phillips, & Richeson, 2014). Thus, understanding what initiates the diversification of homogeneous groups holds practical significance.

Moreover, by incorporating a Bayesian reasoning model into the diversity literature, we illuminate how an understudied but central feature of all groups—their size—affects how decision-makers perceive and work to alter their organizations' diversity levels. Our work suggests that rather than treating the size of a group as an ancillary control variable, diversity scholars should think carefully about how a

group's size may interact with other features of the group to influence diversity-related perceptions and outcomes. Through the lens of Bayesian reasoning, we identify how group size interacts with group composition to predict the inferences people make about a group's likely selection process, diversity levels, and impression management concerns—all of which, in turn, influence people's motivation to diversify the group.

While we focus on homogeneous groups in this paper, our theorizing can also be applied to groups with different demographic compositions. For example, the size of a non-homogeneous group should still influence the strength of a signal its composition provides to evaluators about how it was formed, etc., However, what is signaled by a group's size should be expected to vary based on the group's composition. We present results from a supplementary study in our General Discussion to illustrate how our theorizing applies to the study of non-homogeneous groups.

Homogeneity, Group Size and Diversity-Related Perceptions

Past research has documented many potential benefits of demographic diversity in groups. For example, positive associations have been shown between diversity and organizational performance, financial performance, and creativity (Herring, 2009; Homan et al., 2015; McKay et al., 2009; Richard et al., 2007; cf. Jehn, Chadwick, & Thatcher, 1997; Lount Jr, Sheldon, Rink, & Phillips, 2015; Thatcher, Jehn, & Zanutto, 2003). Previous work has also shown that majority group members express dissenting ideas more confidently (Phillips & Loyd, 2006) and make higher-quality judgments in the presence of underrepresented group members (Sinaceur, Thomas-Hunt, Neale, O'Neill, & Haag, 2010). In addition, minority group members are more likely than majority group members to share unique information and perspectives in teams (Phillips, 2003; Phillips, Mannix, Neale, & Gruenfeld, 2004). And yet, despite these benefits, homogenous groups remain common in many organizations (Bouvy & Mujoomdar, 2019; Institutional Shareholder Services, 2019; Kumar, 2018; Larcker & Tayan, 2020). As a result, it is important to understand what kick-starts diversification efforts in organizations.

We propose that a homogenous group's size can shape the way it is perceived, as well as whether efforts to diversify it will be initiated, offering insight into motives that can more generally propel

diversification efforts. Why might group size matter in this way? A core tenet of judgment and decision-making theory is that people tend to form beliefs in a logical, Bayesian manner, acting like good intuitive statisticians even when making automatic judgments or split-second decisions (Charness & Levin, 2005; Dawes, 1989; Gigerenzer & Hoffrage, 1995; Green & Daniels, 2021; Grieco & Hogarth, 2009; Griffiths & Tenenbaum, 2006; Kersten, Mamassian, & Yuille, 20004; Moore & Small, 2008; Slovic & Lichtenstein, 1971). For example, Green and Daniels (2021) show that baseball umpires making split-second decisions seem to respond with a Bayesian instinct when calling pitches by integrating the imperfect information they observe about a pitch's location with their expectations about the pitch's most likely location.

We propose that people also use Bayesian reasoning when forming their perceptions of a group. A group of people in an organization can be conceptualized as the result of a series of personnel selection decisions, with each individual group member representing the outcome of one such decision. Larger groups then provide a stronger signal for making inferences about the group, such as whether the group is diverse or not, relative to smaller groups. In other words, because larger groups can be thought of as providing a larger "sample size," evaluators have more accurate information to assess whether or not the group is representative of the underlying population when judging its diversity (or lack thereof).

For example, imagine two people—John and Jane—are each evaluating the diversity of their teams, both of which were created by selecting members from a population equally composed of Computer Science (CS) majors and Math majors. John's group has four members, while Jane's group has eight members. Each one knows that their group could have been created through one of two hiring processes: Process A, which is biased in favor of CS majors (so around 90% of hires are CS majors, and 10% are Math majors), or Process B, which doesn't favor any group (so around 50% of hires are CS majors and around 50% of hires are Math majors). Before seeing their groups, John and Jane may believe it is equally likely that they have been assigned a group created through Process A or Process B. However, if John learned that his four-person group consisted entirely of CS majors, it would be appropriate for him to suspect that his group was more likely created through Process A than Process B.

On the other hand, if Jane saw that her eight-person group consisted entirely of CS majors, it would be appropriate for her to have an *even stronger suspicion* than John that her group was selected through Process A rather than Process B because the larger size of the team she is assessing provides a larger sample from which to draw conclusions about possible bias. In other words, Bayesian reasoning should lead people to form different judgments about larger homogeneous groups than smaller ones. Put another way, seeing eight consecutive coin flips land on heads offers a stronger signal that one is observing a biased coin than seeing the same coin land on heads just four consecutive times.

Consistent with this idea, there is some prior empirical evidence that individuals form beliefs and judgments about groups of different sizes as predicted by a Bayesian model of reasoning. Schlueter and Scheepers (2010) found that people formed stronger beliefs about how threatening an outgroup was based on its size, with larger groups perceived as more threatening, suggesting that the size of a group can influence perceptions of the group. We expect a similar process to play out with respect to diversity-related perceptions of a group: larger groups, compared to smaller groups, provide evaluators with a stronger signal about whether and how sharply the group's composition deviates from the composition of the underlying population from which group members were drawn. This should influence the diversity-related perceptions formed about groups. Further, we propose that these perceptions can be expected to shape key decisions about who else should be added to the group.

Although our theorizing focuses on homogeneous groups with implications for understanding what will kick-start diversification efforts in such groups, it can naturally be extended to the study of non-homogeneous groups as well. Larger groups—whether they are homogenous or not—provide more information to evaluators. However, in the case of diverse groups, for example, a larger group size provides a stronger signal about the group's diversity (rather than its lack thereof). In our General Discussion, we elaborate on the predictions about diverse groups that result from our theorizing, and we discuss data from a supplemental study that supports those predictions.

Perceptions of a Homogeneous Group's Selection Process

People tend to perceive an organization's selection process as "fair" when it shows no bias against particular applicants and as "unfair" when bias exists (Blader, 2007; Gilliland, 1993; Leventhal, Karuza, & Fry, 1980). By definition, homogeneous groups only contain members of a single demographic category. Thus, homogeneous groups may be perceived as the product of a discriminatory selection process involving bias against members of unrepresented demographic categories (Harris, Lievens, & Van Hoye, 2004; Gilliland, 1993; Patterson & Zibarras, 2011). If people act like intuitive Bayesians, then because larger homogeneous groups provide a stronger signal than smaller ones about the selection process of group members, people should infer that larger homogeneous groups were more likely formed by biased—and therefore unfair—selection processes than smaller homogeneous groups (Blader, 2007; Holt & Smith, 2009; Leventhal et al., 1980).

For example, an all-male (or all-White) team might be seen as providing potential evidence of a hiring process that is biased against women (or racial minorities; Gilliland, 1993; Patterson & Zibarras, 2011). This belief should be stronger among Bayesians the larger the all-male (or all-White) team is because, for larger teams, the probability of not selecting a woman (or racial minority) for *any* position by chance (rather than due to bias) is smaller (Maxwell, Kelley, & Rausch, 2008). Thus, we hypothesize the following:

Hypothesis 1a. Larger homogeneous groups will be perceived as more likely to stem from unfair selection processes than smaller homogeneous groups.

Perceptions of a Homogeneous Group's Diversity Levels

Objective diversity focuses on the presence of differences within a group, while perceived diversity is defined by whether people recognize and are aware of those differences (Bauman, Trawalter, & Unzueta, 2014; Harrison & Klein, 2007; Shemla, Meyer, Greer, & Jehn, 2016). Perceived diversity is also driven by subjective factors, such as motivated reasoning and self-serving biases (Bauman et al., 2014; Unzueta & Binning, 2012; Unzueta, Knowles, & Ho, 2012). Thus, different evaluators can perceive the same group's diversity very differently.

For a Bayesian observer, larger (as compared to smaller) homogeneous groups provide stronger signals that a group's composition reflects a true lack of diversity and not some chance event (Holt & Smith, 2009). Reductions in ambiguity of this type would make it harder to perceive a homogeneous group as diverse (Dunning, Meyerowitz, & Holzberg, 1989; Kunda, 1990), so Bayesian evaluators should be more certain that a larger homogenous group is, indeed, lacking in diversity than a smaller homogenous group. Thus we hypothesize the following:

Hypothesis 1b. Larger homogeneous groups will be perceived as less diverse than smaller homogeneous groups.

Perceptions of a Homogeneous Group's Diversity-Related Impression Management Concerns

Impression management describes efforts by individuals, groups, or organizations to ensure that they are perceived in a positive light (Elsbach & Sutton, 1992; Highhouse, Brooks, & Gregarus, 2009). Impression management concerns arise when there is reason to worry that outside parties may have a negative perception of a group or organization that could harm it in some way (Dutton, Dukerich, & Harquail, 1994).

Some groups and organizations pursue greater diversity due to impression management concerns. For example, Chang et al. (2019) offer evidence that organizations try to increase the diversity of highly visible groups in response to impression management concerns and note that groups lacking in diversity can face negative reputational consequences (like the backlash faced by *Paul, Weiss* in our opening example). Whereas their research focuses on how social norms influence organizations to achieve certain diversity "thresholds," we focus on how a homogeneous group's size influences choices about whether or not to begin diversifying that group at all.

We propose that larger homogeneous groups are more likely to be seen as at risk of facing diversity-related impression management concerns than smaller ones. This prediction is based on simulation theory (Gallese & Goldman, 1998; Shanton & Goldman, 2010), which suggests that individuals predict others' thoughts and mental states by using *their own* thoughts and mental states as a template to simulate what others might be thinking. Thus, if evaluators form diversity-related judgments

about a homogeneous group using Bayesian reasoning as we propose, then they should intuit that a larger homogeneous group looks less diverse and more likely to have been formed by a biased selection process than a smaller homogeneous group. Importantly, they should also be concerned about outside observers arriving at similar conclusions. This would be more likely to generate diversity-related impression management concerns for larger homogeneous groups than smaller ones.

Hypothesis 1c. Larger homogeneous groups will be expected to be more likely to face diversity-related impression management concerns than smaller homogeneous groups.

Perceptions of the Influence Wielded by New Group Members Who Add Diversity in Homogeneous Groups

An individual group member's influence within a group and over group outcomes diminishes in larger groups relative to smaller groups (Carron & Spink, 1995; Zaccaro, 1984; Spreitzer, 1995). While this is true for any newly added group member, demographically underrepresented group members added to previously homogeneous groups may be particularly likely to wield less influence as group size increases. This is because an underrepresented member added to a group dilutes the group's homogeneity less in larger than smaller groups, and research on tokenism suggests that the negative consequences of being underrepresented in a group are exacerbated when the group is more "skewed"—that is, when the demographic minorities in the group are less well-represented (Kanter, 1977). For example, a woman added to an all-male group of four creates a group whose composition is 20% female, but if she instead joins an all-male group of nine, the new group will be only 10% female.

The potential negative consequences of being underrepresented in a group include feelings of exclusion or ostracism, identity-based discrimination, and pressure to behave according to identity-based stereotypes (Kanter, 1977; MacCorquodale & Jensen, 1993; Mehra, Kilduff, & Brass, 1998; Schaffer & Riordan, 2013; Watkins, Simmons, & Umphress, 2019). Past research has shown a universal awareness that tokens may face negative consequences (MacCorquodale & Jensen, 1993). Therefore, as the size of a homogeneous group increases, meaning that a newly added underrepresented member would be more outnumbered, Bayesian observers should form a stronger belief that the new underrepresented member

faces a risk of experiencing the negative effects of tokenization. We therefore predict that for larger homogeneous groups, a newly added member who is demographically underrepresented will be expected to wield less influence.

Hypothesis 1d. Larger homogeneous groups will be viewed as allowing newly added members who are demographically underrepresented to wield less influence than smaller homogeneous groups.

Effects of Homogeneous Group Size on Diversity-Related Hiring Decisions

Past research has demonstrated that most people dislike inequity and unfairness and try to rectify perceived injustices they identify (Fehr & Fischbacher, 2004; Fehr & Schmidt, 1999; Hegtvedt, Johnson, Ganem, Waldron, & Brody, 2009; Lotz, Okimoto, Schlösser, & Fetchenhauer, 2011). This suggests that the more likely people presume it is that a group was formed through an unfair selection process that denied opportunities to members of underrepresented groups, the more likely they will be to try to diversify the group in an attempt to correct this.

Further, people are more likely to diversify groups that are seen as insufficiently diverse, whether due to an organization's failure to represent its customer base, a mismatch in representation across an organization's hierarchy, or some other failure to meet diversity goals (Avery, McKay, Tonidandel, Volpone, & Morris, 2012; Beaurain & Masclet, 2016; Eagly & Carli, 2007; Ely & Thomas, 2001; Koch, D'Mello, & Sackett, 2015; Ng & Wiesner, 2007). This suggests that the less diverse decision-makers perceive a group to be, the more eager they will be to diversify it.

In addition, organizations have been shown to preemptively use impression management strategies when anticipating negative reputational consequences (Elsbach, Sutton, & Principe, 1998; Graffin, Carpenter, & Boivie, 2011). In other words, if organizations *anticipate* that their actions might generate negative perceptions, they preemptively engage in impression management techniques to protect their public image. Therefore, we expect that as decision-makers perceive a group to be more at risk of triggering negative diversity-related impressions, they will be more likely to diversify the group in an effort to avoid the potential negative reputational consequences of lacking diversity.

Finally, people may prefer to add demographic minorities to homogeneous groups when they believe those minorities will be less influential. Despite the many potential benefits of diversity, many continue to view diversity as costly (Mannix & Neale, 2005; van Knippenberg & Schippers, 2007), and may hold biased attitudes about the competence of people from underrepresented groups, which can lead to discriminatory hiring decisions (Heilman, 1983; Lyness & Heilman, 2006; Petsko & Rosette, 2022). Further, diversity can increase actual or perceived conflict within groups (Jehn et al., 1997; Lount Jr et al., 2015; Thatcher et al., 2003). As a result, people may see diversifying a homogeneous group as having accompanying costs, despite the benefits for fairness and impression management. However, if people expect demographic minorities to be less influential in larger groups, then adding an underrepresented group member to a larger team may be seen as an effective way to capture the potential benefits of an underrepresented group member's presence while minimizing the perceived accompanying costs. Given that economic theory predicts the demand for a resource has an inverse relationship with its cost (Mankiw, 2020), we expect decision-makers to be more willing to diversify larger homogeneous groups than smaller ones.

Together, this leads us to make the following predictions:

Hypothesis 2. The likelihood of selecting an underrepresented candidate for a position in a homogeneous group will be higher for larger groups than smaller groups.

Hypothesis 3a. The effect of group size on the likelihood of selecting an underrepresented candidate to join a homogeneous group will be mediated by the perceived fairness of the homogeneous group's selection process.

Hypothesis 3b. The effect of group size on the likelihood of selecting an underrepresented candidate to join a homogeneous group will be mediated by the homogeneous group's perceived diversity.

Hypothesis 3c. The effect of group size on the likelihood of selecting an underrepresented candidate to join a homogeneous group will be mediated by the perceived diversity-related impression management concerns faced by the homogeneous group.

Hypothesis 3d. The effect of group size on the likelihood of selecting an underrepresented candidate to join a homogeneous group will be mediated by the perceived influence wielded by the underrepresented candidate if they were added to the group.

If decision-makers are especially motivated to diversify larger homogeneous groups by adding underrepresented members (e.g., adding a woman to an all-male group, or a non-White person to an all-White group), then as a downstream consequence of decision-makers exerting extra effort to diversify larger homogeneous groups, larger homogeneous groups should be underrepresented relative to chance expectations. In other words, if decision-makers disproportionately react to a lack of diversity in larger homogeneous groups but not smaller ones, and if they respond by working especially hard to diversify larger homogeneous groups, then we should see a relative scarcity of large homogeneous groups compared to expectations.

Hypothesis 4. As group size increases, the likelihood of observing homogeneity will decrease significantly more than predicted by chance.

Overview of Studies

In this paper, we present evidence from three experiments and a field study testing our hypotheses. Across all four studies, we examine how homogeneous group size influences the likelihood of selecting an underrepresented candidate (Hypothesis 2). In Study 3, we also test the mechanisms that we theorize underlie the relationship between homogeneous group size and diversification decisions (Hypotheses 1 and 3). In Study 4, we extend our online studies to the field and present data to establish the external validity of our theory about homogenous groups. Study 4 also tests our hypothesis that larger homogeneous groups should be particularly underrepresented "in the wild," following our theory that decision-makers will exert more effort to avoid homogeneity in large groups than small ones (Hypothesis 4).

Study 1: How the Size of an All-White Group Affects the Decision to Hire a Black Candidate

In Study 1, we test whether people are more likely to hire a Black employee to join an all-White group as its size increases (Hypothesis 2).

Method

Participants. We recruited 600 participants through Amazon Mechanical Turk (50% identified as men, 75% identified as White). Participants were paid $0.45 for completing a survey they were told would take approximately three minutes. This study was pre-registered on AsPredicted.org (http://aspredicted.org/blind.php?x=8u9qj6).

Procedures. Participants were asked to imagine that they were hiring a consultant to join a work group at their consulting company. They were given a job description for the work group's open position and were then shown the names and faces (taken from the Chicago Face Database; Ma, Correll, & Wittenbrink, 2015) of the current members of the work group. All participants were shown an all-male, all-White group. We randomly varied the size of the work group so it included one to eight people. That is, participants in *condition one* saw a work group including one White man, participants in *condition two* saw a work group including two White men, and so on, up to participants in *condition eight*, who saw a work group including eight White men.

Next, participants were shown a set of three candidates—two White men and one Black man—and asked to hire one of them to join the work group.[1] Participants were provided with the candidates' pictures (again taken from the Chicago Face Database; Ma et al., 2015) and qualifications, which included the candidates' education, years of experience, and most recent job. We stimulus-sampled candidate pictures and qualifications across participants to ensure our effects were not driven by the particular stimuli chosen.[2]

After making a hiring decision, participants answered manipulation check questions asking them to recall the size of the original work group displayed to them as well as the number of Black consultants

[1] Across all of our experiments, we varied candidate qualifications such that the underrepresented candidate was always objectively more qualified than one of the White male candidates and less qualified than the other White male candidate, and this feature was held constant across all experimental conditions.
[2] We created four sets of three candidates, and participants were randomly assigned to one of these sets. In a pre-test (see Online Supplement Study S2), we find no significant differences in participants' perceptions of how qualified the underrepresented candidate was relative to the most qualified majority candidate in any of the sets.

in the original work group (the correct answer was zero).[3] Finally, participants reported their gender and race. Study materials are available in the Online Supplement.[4]

Results and Discussion

Confirming that our manipulation was effective, participants reported seeing a larger work group when we showed them a larger group ($b = 0.95$, $p < 0.001$), and 77% of participants accurately recalled that the original work group did not include any Black employees.[5] A correlation matrix of all variables collected in this study is available in the Online Supplement (Table S1).

Our dependent variable of interest was a binary indicator for whether participants chose to hire the Black male candidate. Following our pre-registered analysis plan, we ran an OLS regression with robust standard errors to predict whether a Black male candidate was hired. We relied on a linear model because it yields easily interpretable coefficients (Gomila, 2020) but also report results from a logistic regression model, which are extremely similar.

Our only independent variable was the size of the all-White work group shown to participants, which varied from including one person to including eight people. Participants were significantly more likely to hire a Black male candidate the larger the size of the all-White work group ($b = 0.015$, $p = 0.044$; see Figure 1 and Online Supplement Table S2), providing support for Hypothesis 2. We replicate this result when we analyze our data using a logistic regression instead of an OLS regression ($b = 0.085$, $p = 0.045$; see Online Supplement Table S2).[6]

Insert Figure 1 about here

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[3] As a pre-registered robustness check, we checked whether our results held if we only analyzed data from participants who remembered the size of the original group shown to them, plus or minus one, and also remembered that the original group contained zero Black people. This did not change our results (in any of our studies).

[4] The Online Supplement can be found on OSF (which also contains anonymized study data and analysis code): https://osf.io/jzr6d/?view_only=d69ecfd8b11548d3859a6e97e1ee042b

[5] Participants randomly assigned to view larger groups incorrectly recalled seeing more Black people in these (all-White) groups ($b = 0.024$, $p = 0.023$). The direction of this recall error should make our test of Hypothesis 2 more conservative if people are less inclined to diversify groups that they believe already have some diversity.

[6] As a robustness check, we reran our analyses excluding the "group size = 1" condition. When we do this, our results are directionally consistent and become marginally significant (OLS $b = 0.017$, $p = 0.059$; Logistic $b = 0.096$, $p = 0.064$).

Study 1 provides initial empirical support for our hypothesis that decision-makers are more likely to diversify larger racially homogeneous groups than smaller ones. Study S1 in our Online Supplement presents a conceptual replication in the context of gender diversity, showing that decision makers are also more likely to add women to larger, all-male groups than smaller ones.

Study 2: How the Size of an All-Male Group Affects Real Decisions to Recommend Women

In Study 2, we extend the results of Study 1 to a setting where participants make real (rather than hypothetical) decisions when offered the opportunity to add gender diversity to a homogeneous group.

Method

Participants. We recruited 2,373 college-educated participants through Prolific Academic (42% identified as men).[7] Participants were paid $0.60 to complete a roughly four-minute survey. This study was pre-registered on AsPredicted.org (https://aspredicted.org/ZTB_VX9).

Procedures. Participants were truthfully told that an East Coast business school was seeking recommendations for professors to invite as speakers for an online seminar series that was intended to appeal to a broad audience. Participants were given a description of the seminar series, and they were shown a group of professors who had already been selected for inclusion in this seminar series. Specifically, for each professor already included in the seminar series, participants were shown their name, face (drawn from the professor's website), institution, years of experience (taken from the professor's CV), area of expertise, and seminar topic. All participants were shown a group of all-male, all-White speakers. We randomly varied whether participants were shown two (*size two condition*) or eight (*size eight condition*) White male speakers who had already been invited to the seminar. Thus, we manipulated whether participants were assigned to see a smaller or larger homogeneous group.

Next, participants were shown a set of three potential speakers: two White male professors and one White female professor. They were asked to recommend one person to add to the seminar series. Participants were provided with the potential speakers' names, faces, institution, years of experience,

[7] We recruited college-educated participants to ensure they were familiar with academic seminars.

areas of expertise, and a potential topic they could speak on (all information was drawn from actual candidate speakers' websites and CVs). As with our previous studies, we stimulus-sampled candidates across participants.[8] After concluding data collection, we shared all recommendations with the organizers of the seminar series.

After making their speaker recommendation, participants answered manipulation check questions that asked them to recall the size of the original group of included speakers as well as the number of women in the original group (the correct answer was zero). Finally, participants reported their gender. Complete study materials are available in the Online Supplement.

Results and Discussion

Confirming that our manipulation was again effective, participants reported seeing a larger original group of speakers in the *size eight condition* than the *size two condition* ($b = 5.44$, $p < 0.001$), and 74% of participants accurately recalled that the original group of speakers did not include any women.[9] A correlation matrix of all variables collected in this study is available in the Online Supplement (Table S3).

Our dependent variable of interest was a binary indicator for whether participants chose to recommend the female professor be added as a speaker. Following our pre-registered analysis plan, we ran a two-sample proportions test comparing how many participants recommended the female professor across conditions. Participants were significantly more likely to recommend the female professor in the *size eight condition* (43.9% did so) than in the *size two condition* (35.8% did so, $p < 0.001$). This provides further support for Hypothesis 2 in a setting involving real recommendation decisions.

Study 3: The Mediating Role of Diversity-Related Perceptions

In Study 3, we test Hypotheses 1a-1d and 3a-3d, exploring the mechanisms responsible for the relationship between homogeneous group size and selection decisions documented in Studies 1-2.

Method

[8] We created two sets of three candidates, and participants were randomly assigned to one of these sets.

[9] Participants randomly assigned to view the larger group incorrectly recalled seeing more women in the group ($b = 0.21$, $p < 0.001$). As described in Footnote 5, the direction of this recall error should make our test of Hypothesis 2 more conservative.

Participants. We recruited 1,310 participants through Amazon Mechanical Turk (45% identified as men). Participants were paid $0.50 for completing a roughly four-minute survey. This study was pre-registered on AsPredicted.org (https://aspredicted.org/blind.php?x=x5a4av).

Procedures. Participants were asked to imagine they were a hiring manager at a technology company tasked with hiring a software engineer to join an Innovation Team. Participants were given a job description for the Innovation Team's open position, and they were then shown the names and faces (taken from the Chicago Face Database; Ma et al., 2015) of the current members of the Innovation Team. All participants were shown an all-male, all-White current Innovation Team. As in Study 1, we randomly varied the size of the current Innovation Team from having as few as one to having as many as eight (White male) members.

Next, participants were shown a set of three candidates—two White men and one White woman—and asked to select one of them to join the Innovation Team. Participants were provided with the candidates' pictures (taken from the Chicago Face Database; Ma et al., 2015) and qualifications, which included the candidates' years of work experience and most recent job title. We stimulus-sampled candidate pictures and qualifications across participants.[10]

After participants made their hypothetical hiring decision, they answered a series of questions measuring our hypothesized mediators. All scale items used in this study are available in the Online Supplement. All items across all scales were measured using 7-point Likert scales where 1 was defined as "Strongly Disagree" and 7 was defined as "Strongly Agree."

Perceived fairness of the original group's selection procedure. To measure the perceived fairness of the process used to select the members of the original Innovation Team, we adapted one question from Sweeney and McFarlin's (1997) procedural justice scale ("The procedures used to evaluate and select the members of the original Innovation Team were likely fair and objective.").

[10] We created four sets of three candidates, and participants were randomly assigned to one of these sets. In a pre-test (see Online Supplement Study S2), we find no significant differences in participants' perceptions of how qualified the underrepresented candidate was relative to the most qualified majority candidate in any of the sets.

Perceived diversity of the original group. To measure the perceived diversity of the original Innovation Team, we used a three-item scale adapted from Unzueta and Binning's (2012) perceived diversity scale (Cronbach's $\alpha = 0.88$, e.g. "The original Innovation Team had a high degree of gender diversity.").

Diversity-related impression management concerns faced by the original group. To measure the diversity-related impression management concerns relating to the original Innovation Team, we used a two-item scale adapted from Chng, Rodgers, Shih, and Song's (2014) image concerns scale (Cronbach's $\alpha = 0.92$; e.g. "The tech company should be worried about how key stakeholders will perceive the diversity of the original Innovation Team.").

Potential for a new addition to influence the group. To measure the perceived influence a woman would wield if she were added to the original Innovation Team, we used a three-item scale adapted from Spreitzer's (1995) impact scale (Cronbach's $\alpha = 0.83$, e.g. "If a woman were added to the original Innovation Team, she would have a large impact on the group's work.").

Multi-item scales were averaged across items. After responding to our mediator questions, participants answered manipulation check questions asking them to recall the size of the original Innovation Team as well as the number of women on the original Innovation Team. Finally, participants reported their gender. Study materials are available in the Online Supplement.

Results and Discussion

Confirming that our manipulation was effective, participants reported seeing a larger Innovation Team when we showed them a larger one ($b = 0.86$, $p < 0.001$). In addition, 87% of participants accurately reported seeing zero women in the Innovation Team.[11] A correlation matrix of all variables collected in this study is available in the Online Supplement (Table S4).

First, following our pre-registered analysis plan, we ran an OLS regression with robust standard errors to predict whether a female candidate was hired. The dependent variable was a binary indicator for

[11] Group size was not related to the number of women participants reported seeing in the original (all-male) Innovation Team ($b = -0.026$, $p = 0.532$).

whether or not a female candidate was hired. Our only independent variable was the size of the all-male Innovation Team shown to participants, which varied from one to eight. Consistent with Hypothesis 2, participants were significantly more likely to select a female candidate for larger all-male Innovation Teams ($b = 0.027$, $p < 0.001$; Online Supplement Table S5). We replicate this result when we analyze the data using a logistic regression instead of an OLS regression ($b = 0.148$, $p < 0.001$; see Online Supplement Table S5).[12]

Next, we tested whether group size had an effect on participants' diversity-related perceptions of the homogeneous group (Hypotheses 1a-1d). To test Hypotheses 1a-1d, we ran four separate OLS regressions with all-male Innovation Team size as the independent variable. The dependent variables in these four regressions were: (i) the perceived fairness of the Innovation Team's selection process (to test Hypothesis 1a); (ii) the perceived diversity of the Innovation team (to test Hypothesis 1b); (iii) the perceived diversity-related impression management concerns faced by the Innovation Team (to test Hypothesis 1c); and (iv) the perceived influence a woman would wield if she was added to the Innovation Team (to test Hypothesis 1d). We find that participants judged the group's selection process as more unfair for larger all-male Innovation Teams than smaller all-male Innovation Teams ($b = -0.131$, $p < 0.001$), supporting Hypothesis 1a. Participants also perceived larger all-male Innovation Teams to be less diverse than smaller all-male Innovation Teams ($b = -0.127$, $p < 0.001$), supporting Hypothesis 1b. Supporting Hypothesis 1c, participants believed the larger all-male Innovation teams was more likely to face diversity-related impression management concerns than the smaller all-male Innovation teams ($b = 0.145$, $p < 0.001$). Finally, consistent with Hypothesis 1d, participants believed a woman added to an all-male Innovation Team would wield less influence in larger teams than in smaller ones ($b = -0.038$, $p = 0.008$). See Online Supplement Table S6 for detailed regression results.

Finally, we tested whether our hypothesized mechanisms mediated the effect of an all-male group's size on participants' likelihood of hiring a female candidate to join the group (Hypotheses 3a-3d).

[12] As a robustness check, we reran our analyses excluding the "group size = 1" condition. When we do so, our results remain statistically significant (OLS $b = 0.028$, $p < 0.001$; Logistic $b = 0.148$, $p < 0.001$).

Following our pre-registration, we ran a 5,000-sample bootstrapped multiple mediation model (Preacher & Hayes, 2008) including measures of all four hypothesized mediators. We find that all four hypothesized mediators—perceived fairness of the original all-male Innovation Team's selection process ($b = 0.006$, $p < 0.001$; 95% CI: [0.004, 0.009]), perceived diversity of the original Innovation Team ($b = 0.006$, $p < 0.001$; 95% CI: [0.003, 0.008]), diversity-related impression management concerns faced by the original Innovation Team ($b = 0.009$, $p < 0.001$; 95% CI: [0.006, 0.012]), and the perceived influence a woman would wield if added to the original Innovation Team ($b = -0.002$, $p = 0.018$; 95% CI: [-0.004, -0.0004])—mediated the relationship between the randomly assigned size of the original Innovation Team and participants' likelihood of hiring a female candidate to join the team, providing support for Hypotheses 3a-3d. The full results from this mediation model can be found in the Online Supplement (Figure S1). We also tested each mediator individually using separate mediation models, and those analyses provide convergent support for our hypotheses (see Online Supplement Figure S2).

Notably, the association we measured between the anticipated influence a female candidate would exert if added to an Innovation Team and participants' propensity to hire a female candidate ran counter to our hypothesizing (Hypothesis 3d). We predicted that a woman added to an all-male group would be expected to wield less influence in larger all-male groups, and this is what we found. However, contrary to our theorizing, participants were more likely to hire a woman into an all-male group if they thought she would wield *more* influence ($b = 0.077$, $p < 0.001$). This suggests that participants considered adding a woman's perspective to an all-male group to be a benefit rather than a "risk" or "cost" to be avoided. This may be due to the well-documented benefits of diversity on outcomes such as organizational performance, financial performance, creativity, and information-sharing within groups (Herring, 2009; McKay et al., 2009; Phillips, 2003; Phillips & Loyd, 2006; Richard et al., 2007; Sinaceur et al., 2010). Our finding highlights one possible way in which larger homogenous groups are *less* attractive targets for diversification than smaller ones—larger homogeneous groups may be seen as less likely to reap the potential benefits of diversification.

In addition to conducting our pre-registered analyses, as a robustness check, we reran our analyses excluding the experimental condition involving an Innovation Team with just one White male member (since several of our mediator measures asked about the original Innovation Team, and arguably, a single person cannot be evaluated as a team). When we do this (see Online Supplement Figure S3), our results are unchanged with one exception: we no longer find support for Hypothesis 1d. Specifically, the negative effect of the all-male group's size on the perceived influence a woman would wield if added becomes insignificant (b = -0.010, p = 0.576).

Study 4: Group Homogeneity and Size on U.S. Corporate Boards

In Study 4, we move from online experiments to the field, testing the predictions of our theory in an important organizational context: U.S. corporate boards in the S&P 1500. Although corporate boards represent just one possible context where our theorizing about homogeneous groups may apply, these groups exert considerable influence, overseeing companies in the S&P 1500 that represent roughly 90% of the total U.S. stock market capitalization (S&P Dow Jones Indices, 2019). Corporate boards in the United States are also often subject to external pressures relating to their lack of diversity (Green, 2020; McGreevy, 2018), which means that board members should care about how their group might be perceived.

Study 4A: Board Size and the Likelihood of Adding Underrepresented Group Members

To test Hypothesis 2 in a field setting, in Study 4A, we first examine whether larger, all-male S&P 1500 corporate boards are more likely than smaller all-male boards to diversify by adding new, female directors. We then examine whether all-White S&P 1500 corporate boards are more likely than smaller all-White boards to diversity by adding new, non-White directors.

Method

Data. The data for these analyses come from Institutional Shareholder Services (ISS) Director Data. ISS Director Data includes information on individual members of the boards of directors of

companies in the S&P Composite 1500, including each director's name, gender, and race/ethnicity.[13] For this analysis, we used data from 2007—the earliest year for which data was available in a consistent format—through 2018, the most recent year of data available to us as of July 21, 2019, when we first accessed the ISS database. To test Hypothesis 2, which claims that larger homogeneous boards will be more likely to add an underrepresented member than smaller homogeneous boards, we restricted our dataset to years in which a company had an all-male board. For each all-male board, we have information about its composition during year *t* and year *t*+1. This allows us to use the all-male board's size in year *t* to predict whether it added any women in year *t*+1. Thus, our unit of observation was a board-year, since an individual company could contribute multiple observations to the dataset. This left us with 3,593 board-year observations (across 836 unique corporate boards) to analyze.

Control variables. We included a battery of control variables in our analyses to help rule out alternative explanations for our findings.[14] We included the following financial performance indicators and firm metrics to alleviate concerns about firm size or performance as alternative explanations for our findings: a firm's market capitalization in a given year[15], a firm's return-on-assets in a given year, a firm's logged total assets in a given year, a firm's 1-year total-shareholder-returns in a given year, a firm's market-to-book ratio in a given year, a firm's Tobin's Q in a given year, a firm's number of employees in a given year, and the logged compensation of a firm's CEO in a given year.

We included the following controls to account for the possibility that our findings reflect differences in corporate governance among firms with larger versus smaller boards: a firm's level of institutional ownership in a given year measured using percentage of shares owned by institutions (Brown, Anderson, Salas, & Ward, 2017), the proportion of a firm's board members who are independent

[13] We discovered that 0.5% of directors were labeled with a different gender or race at two different points in time (e.g., the same person was classified as male one year and as female the following year). In all of these cases, we manually fixed the inconsistencies by looking the directors up on Google and company websites.
[14] We selected the specific control variables to include by reviewing all articles published in *Organization Science* since 2015 that used corporate board data and including relevant control variables used in those papers.
[15] Some scholars control for the stock market index that a firm belongs to. However, since a firm's market capitalization is one of the key factors determining stock index membership, we decided to simply control directly for firm market capitalization instead since it provides a continuous measure.

in a given year, a firm's board's classification (i.e., whether its members are elected to terms that expire in different years), and whether a firm's board has a majority voting system.

To account for the possibility that other dimensions of board diversity influence decision-making, which could covary with board size, we included a firm's board's age diversity as measured by the standard deviation of all members' ages in a given year (Triana, Miller, & Trzebiatowski, 2014) and a firm's board's tenure diversity as measured by the standard deviation of all members' tenure on the board in a given year (Triana et al., 2014). We also included fixed effects for calendar year in our analyses to account for time trends. Finally, we included fixed effects for the industry that a firm belongs to in order to alleviate concerns that specific industries might also have larger or smaller boards, on average, which could be driving the effects of interest.[16]

Following the recommendation of Becker (2005), we present our analyses both with and without the aforementioned controls. In case of missing data for any of our control variables, we added an additional "missing" category for each categorical variable, and we used mean imputation and included binary indicators for all missing continuous variables. We winsorized all continuous control variables that were not already logged at the 0.5^{th} and 99.5^{th} percentiles to prevent outliers from exerting undue influence on our analyses. However, our results are essentially identical even if we do not winsorize any control variables.

Analysis strategy. We estimated OLS and logistic regressions to predict whether an all-male board added a woman to its ranks in a given year (thus eliminating its homogeneity). We clustered standard errors at the board level to account for non-independence of data due to repeated observations for firms across years. Our binary dependent measure took on a value of 1 if the all-male board added at least one woman between year *t* and year *t+1*, and it took on a value of 0 otherwise. Our main predictor was the size of the all-male board.

Results

[16] See Online Supplement for information on how each of these control variables was accessed.

Summary statistics. A correlation matrix of all variables used in this study is available in the Online Supplement (Table S7). Of the 3,593 all-male board-year observations, 564 (15.7%) involved boards that added at least one woman in the following year. Boards ranged in size from 3 to 18, with a median size of 7. We winsorized board size at the 0.5^{th} and 99.5^{th} percentiles to prevent outliers from exerting undue influence on our analyses. The winsorized board size distribution ranged from 4 to 14. Robustness checks where we do not winsorize the size distribution are reported in the Online Supplement (Table S8) and yield similar results to those reported below.

Are larger all-male boards more likely to add women? As Table 1, Model 1 shows (using an OLS regression), the size of an all-male board is a significant and positive predictor of whether a woman was added to the board in the following year ($b = 0.019$, $p < 0.001$). Specifically, there was an average increase of 1.9 percentage points in the likelihood that a given all-male board would diversify in a given year associated with each additional board member. As Table 1, Model 2 shows, this result is consistent when we use a logistic regression ($b = 0.141$, $p < 0.001$, $OR = 1.15$). Thus, larger all-male boards were more likely to add a woman to their ranks than smaller all-male boards, consistent with Hypothesis 2. Figure 2 shows that the likelihood of adding a woman increases across the range of possible board sizes. As shown in Table 1, Model 3, when we add our control variables, we find that our predictor for board size is still positive and significant ($b = 0.009$, $p = 0.039$), corresponding to about a 0.9 percentage point increase in the likelihood of an all-male board diversifying for each additional member. As Table 1, Model 4 shows, this result is consistent, though marginally significant, when we use a logistic regression ($b = 0.059$, $p = 0.087$, $OR = 1.06$).

As a robustness check, we reran our regression model but omitted any control variables that had an absolute correlation of 0.1 or greater with our independent variable of interest—all-male board size—to avoid multicollinearity issues and the problem that these variables (e.g., number of employees) might

be proxies for board size rather than appropriate controls.[17] As shown in Table 1, Model 5, when we omit these highly correlated control variables, our predictor for board size is still positive and significant (b = 0.021, $p < 0.001$), corresponding to about a 2.1 percentage point increase in the likelihood of an all-male board diversifying for each additional member. As Table 1, Model 6 shows, this result is consistent when we use a logistic regression (b = 0.171, $p < 0.001$, OR = 1.19).

Are larger all-male boards also more likely to add men? Our analysis has an important limitation: to add a woman to a board, that board must first decide to change its membership. If larger boards change membership more frequently (because of staggered term limits or because the likelihood that at least one board member will leave in a given year increases as the number of members increases), then larger boards will artificially have more opportunities to add women, which could provide an uninteresting explanation for our findings.

To address these concerns, we reran our analysis examining whether all-male boards are more likely to add *men* to their ranks as their size increases. If our results are simply driven by the fact that larger boards change membership more frequently, then we should expect larger all-male boards to be more likely to add women *and* men to their ranks as their size increases. However, we find that this is not the case. As shown in Table 2, Model 1, an OLS regression predicting whether a man was added to an all-male board using board size as a predictor shows that the size of an all-male board is an insignificant and directionally negative predictor of adding a new male director (b = -0.004, p = 0.452; see Figure 2). We find the same pattern when using a logistic regression (b = -0.017, p = 0.453, OR = 0.98; Table 2, Model 2). Model 3 shows that when we add all of our control variables, the coefficient on board size remains negative and is statistically significant (b = -0.017, p = 0.007), such that all-male boards are 1.7 percentage points *less* likely to add another man to their ranks for each additional member. Model 4 shows that this pattern is consistent when we run a logistic regression (b = -0.076, p = 0.007, OR = 0.93).

[17] This led to us omitting the following variables: firm's market capitalization, firm's logged total assets, firm's Tobin's Q, firm's number of employees, firm's CEO's logged compensation, an indicator for firms in the Information Technology industry, and an indicator for firms in the Financials industry.

Finally, as shown in Model 5, when we omit the control variables that had an absolute correlation of 0.1 or greater with our independent variable of interest, the coefficient on board size remains negative but is insignificant (b = -0.008, p = 0.175), and Model 6 shows that we find the same pattern when we run a logistic regression (b = -0.035, p = 0.178, OR = 0.97)

Next, to compare the coefficients on all-male board size across the two types of models (one predicting the addition of a woman to a board and the other predicting the addition of a man), we ran a Z-test designed to enable such comparisons (Clogg, Petkova, & Harito, 1995; Paternoster, Brame, Mazerolle, & Piquero, 1998). First, comparing the two models that did not include control variables, we find that the coefficient for all-male board size differs significantly between the two models (Z = 3.635, p < 0.001): in other words, all-male board size is a significantly greater predictor of adding a woman to a board than of adding another man. Next, comparing the two models that include all of our control variables, we once again find that the coefficient for all-male board size differs significantly between the two models (Z = 3.405, p < 0.001). Finally, comparing the two models that excluded the control variables that are highly correlated with all-male board size, we again find that the coefficient for all-male board size differs significantly between the two models (Z = 4.147, p < 0.001). Thus, we find that all-male board size positively predicts the addition of women, but not men, to a corporate board, consistent with Hypothesis 2.

Insert Table 1 about here

Insert Figure 2 about here

Does this extend to all-White boards? To test whether our predictions generalize to dimensions of diversity besides gender, we reran our analyses examining all-White boards and the addition of non-White board members. We used ISS data from 2011-2018 because data on race was missing for approximately half of all directors from 2007-2010 (even though ISS data was complete for gender during this period). From 2011-2018, director race was missing in <1% of observations, which we were able to

fill in manually by searching Google and company websites. See Table S9 in the Online Supplement for a correlation matrix of all variables used in these analyses.

Of the 4,350 all-White board-year observations, 330 (7.6%) involved boards that added at least one non-White director in the following year. Boards ranged in size from 3 to 17, with a median size of 8. Once again, we winsorized board size at the 0.5^{th} and 99.5^{th} percentiles. The winsorized board size distribution ranged from size 5 to 14. Robustness checks where we do not winsorize the board size distribution are reported in the Online Supplement (Table S10) and yield similar results to those reported below.

As shown in Table 3, Model 1, all-White board size is a significant and positive predictor of whether a non-White director was added to the board in the following year ($b = 0.009$, $p < 0.001$; see Online Supplement Figure S4). Thus, we estimate a 0.9 percentage point increase in the likelihood of an all-White board diversifying for each additional board member. As Table 3, Model 2 shows, this result is consistent when we use a logistic regression ($b = 0.127$, $p < 0.001$, $OR = 1.14$). This suggests that larger all-White boards were more likely to add non-White directors to their ranks than to smaller all-White boards, which further supports Hypothesis 2. However, as shown in Table 3, Model 3, when we add our full set of control variables, we find that the coefficient on board size is positive, but it is no longer significant ($b = 0.002$, $p = 0.422$), and Model 4 shows that this pattern is consistent when we run a logistic regression ($b = 0.033$, $p = 0.369$, $OR = 1.03$).

Next, as we did for our gender analyses, as a robustness check, we reran our regression model but omitted any control variables that had an absolute correlation of 0.1 or greater with our independent variable of interest—all-White board size.[18] As shown in Table 3, Model 5, when we omit these control variables that may simply be alternative proxies for board size, our predictor for all-White board size is again a positive and significant predictor of adding a non-white director ($b = 0.005$, $p = 0.029$). Here we

[18] This led to us omitting the following variables: firm's market capitalization, firm's logged total assets, firm's Tobin's Q, firm's number of employees, board's tenure diversity, and an indicator for firms in the Financials industry.

see a 0.5 percentage point increase in the likelihood of an all-White board adding a non-White director is associated with each additional board member. Finally, Model 6 shows that this is consistent when we use a logistic regression (b = 0.095, p = 0.003, OR = 1.10).

As noted above, our analysis has the limitation that to add a non-White director, an all-White board must first decide to change its membership, and the rate of change might vary across boards of different sizes. To account for this, we ran additional analyses examining whether all-White boards are more likely to add *White* members to their ranks as their size increases. As shown in Table 4, Model 1, an OLS regression predicting whether a White member was added to an all-White board using board size as a predictor shows that the size of the all-White board is an insignificant predictor (b = 0.001, p = 0.744; see Online Supplement Figure S4), and Model 2 shows that this is also the case when using a logistic regression (b = 0.006, p = 0.744, OR = 1.01). Model 3 shows that the size of the all-White board becomes a negative and marginally significant predictor when we add all of our control variables (b = -0.010, p = 0.055), such that all-White boards are about 1 percentage point *less* likely to add another White person to their ranks for each additional member. Model 4 shows that this is consistent when we run a logistic regression (b = -0.039, p = 0.056, OR = 0.96). Finally, as shown in Model 5, when we omit the control variables that had an absolute correlation of 0.1 or greater with our independent variable of interest, the coefficient on all-White board size remains negative but is statistically insignificant (b = -0.003, p = 0.569), and Model 6 shows that this is also the case when using a logistic regression (b = -0.004, p = 0.819, OR = 1.00)

To compare the coefficients on all-White board size across the two types of models (one predicting the addition of a non-White director to a board and the other predicting the addition of a White director), we first ran a Z-test comparing the two models that did not include controls, and we find that the coefficient for all-White board size differs marginally between the two models (Z = 1.653, p = 0.098): in other words, all-White board size is a marginally significantly greater predictor of adding a non-White director to a board than of adding another White director. Next, we compare the two models that include all of our control variables, and here we find that the coefficient for all-White board size differs

significantly between the two models ($Z = 2.075$, $p = 0.038$). Finally, comparing the two models that excluded the control variables that are highly correlated with all-White board size, we do not find a significant difference in the coefficients on all-White board size between the two models ($Z = 1.469$, $p = 0.142$). Thus, we find only limited evidence that the size of an all-White board positively predicts the addition of new, non-White directors over and above the addition of new, White directors.

Insert Table 2 about here

Robustness checks. We ran additional analyses to check the robustness of our results, all of which can be found in the Online Supplement. We reran our analyses where the unit of observation was a newly added director to an all-male or all-White board, rather than an all-male board year or an all-White board year, and we find similar results (Tables S11-S12). We also ran placebo analyses on a meaningless characteristic of board members (whether their age ended with an arbitrary digit) that should not increase the likelihood of selection as board size increases. As expected, we find that homogeneous board size is not a significant predictor of adding a director with this arbitrary characteristic in our placebo analyses (Table S13). Complete details about our placebo analyses can be found in the Online Supplement.

Study 4B: The Underrepresentation of Large Homogeneous Boards

In Study 4B, we sought to test our predictions about the downstream consequences of decision-makers exerting extra effort to diversify larger homogeneous groups. Specifically, we analyze the composition of S&P 1500 corporate boards in 2018 to test whether larger homogeneous boards (i.e., all-male boards and all-White boards) are more underrepresented relative to chance than smaller homogeneous boards (Hypothesis 4). An unusual scarcity of large homogenous groups would suggest that people react to the negative signals conveyed by large, homogeneous groups by making exceptional efforts to diversify such groups

Method

Data. Our data again come from ISS. We present results using 2018 data, but our results are consistent when analyzing data from 2007 to 2018 (see Online Supplement Table S14).

Analysis strategy. We began by analyzing all-male boards. Because larger boards are mechanically more likely to include at least one woman than smaller boards since they have more seats to fill, we compared the observed distribution of all-male boards across board size with the distribution we would *expect* to see if corporate board directors were chosen from existing directors through a gender-neutral selection process. To do this, we calculated the expected proportion of corporate boards that should be all-male for boards of varying size (ranging from 4 to 23 directors in 2018) based on the null hypothesis that companies select from existing directors and do not consider gender diversity when creating their boards. We then compared the expected proportions of all-male boards of each size to the observed proportions of all-male boards of the same size to determine whether larger boards are disproportionately less likely to be all-male than would be expected by chance.

We calculated the expected proportions of all-male boards using a Monte Carlo simulation method that has been validated in past research (Chang et al., 2019; Dezső, Ross, & Uribe, 2016). In each simulation, we took the existing universe of 2018 S&P 1500 corporate board members and randomly reassigned all directors to new boards. We took as given the number of boards, the size of each board, and the number of board seats held by each individual director, based on the actual 2018 data. Because directors were randomly assigned to new boards, gender was not a factor in the allocation of board seats. This means the simulation process generated a distribution of men and women on corporate boards that we would expect to see if companies ignored gender when selecting board members and if the only people who were qualified to sit on boards were those who already held board seats. Moreover, this process accounts for the fact that larger boards are mechanically less likely to be all-male than smaller boards due to the greater number of seats to fill. For each simulation, we then calculated the proportion of all-male boards for each board size (e.g., the proportion of boards with eight directors that consisted only of men).

We repeated the simulation process 10,000 times, generating 10,000 possible allocations of directors to corporate boards. For each board size, we calculated the mean proportion of all-male boards across all 10,000 simulations and defined this as the *expected* proportion of all-male boards for a given

board size. We also generated 95% confidence intervals around these expected proportions based on our simulated data. Finally, we compared these means to the observed proportions of all-male boards for each board size in 2018.

To test Hypothesis 4, we estimated an ordinary least squares (OLS) regression to predict the difference between the observed and simulated (i.e., expected) proportions of all-male boards, where our main predictor was board size. Note that since we only performed the simulations with one year of data, there are no repeated observations of firms.

Results

Summary statistics. The S&P 1500 consisted of 1,506 corporate boards in 2018. Boards in 2018 ranged in size from 4 directors to 23 directors, with an average of 89 boards of each board size, and 8.1% (n = 123) of boards were all-male. The median number of directors on a board was nine, (see the Online Supplement Tables S15-S16 for summary statistics and the distribution of board sizes in the 2018 data). Once again, we winsorized board size at the 0.5th and 99.5th percentiles. The winsorized board size distribution ranged from size 5 to 16.[19] Robustness checks where we do not winsorize the board size distribution are reported in the Online Supplement (Figure S5 and Table S14) and yield similar results to those reported below.

Are all-male boards more underrepresented among larger boards? Figure 3 depicts the expected proportions of all-male boards across board size as well as the observed proportions of all-male boards in the 2018 data. As shown in Table 5, Model 1, an OLS regression predicting the percent difference between the observed and expected proportions of all-male boards shows that as board size increases, all-male boards become significantly more underrepresented than would be expected by chance (b = -0.148, p < 0.001; see Online Supplement Figure S6). This is consistent with Hypothesis 4.[20] For

[19] Note that the size distribution varies from Study 4A because we are using a different set of ISS data (only data from 2018, and all boards instead of only homogeneous boards).

[20] We also computed the absolute percentage point difference (instead of the percent difference) between the observed and expected proportions of all-male boards for each board size and used this difference as an additional dependent measure, producing similar results (see Online Supplement Table S14).

example, 36% of 6-person boards are all-male in 2018, but based on our simulations, we would only expect 25% of them to be all-male ($p = 0.015$), meaning there are 44% more 6-person all-male boards than there would be if board seats were allocated to existing directors in a gender-blind lottery.[21] On the other hand, only 2% of 11-person boards were all-male in 2018, but based on our simulations, we would expect 8% of them to be all-male ($p = 0.002$), meaning there are 75% fewer 11-person all-male boards than there would be if board seats were allocated to existing directors in a gender-blind lottery.

Insert Figure 3 about here

Does this extend to all-White boards? We reran our simulations and analyses for all-White boards. In 2018, 37.6% ($n = 567$) boards in the S&P 1500 were all-White. Figure 4 depicts the expected proportions of all-White boards across board size as well as the observed proportions of all-White boards in the 2018 data. As shown in Table 5, Model 2, an OLS regression predicting the percent difference between the observed and expected proportions of all-White boards using 2018 data shows that as board size increases, all-White boards become significantly more underrepresented than would be expected by chance ($b = -0.113$, $p < 0.001$; see Online Supplement Figure S7).[22,23] These results provide further support for Hypothesis 4. For example, 60% of 7-person boards were all-White in 2018, but based on our simulations, we would only expect 42% of them to be all-White ($p < 0.001$), meaning there were 43% *more* 7-person all-White boards than there would have been if board seats were allocated to existing directors in a race-blind lottery. On the other hand, only 12% of 12-person boards were all-White in 2018, but based on our simulations, we would expect 22% of them to be all-White ($p = 0.002$), meaning there

[21] The *p*-values for these comparisons are calculated as the proportion of simulations with a result equally extreme or more extreme than the observed value (e.g., the proportion of 10,000 simulations where at least 36% of 6-person boards were all-male; Besag & Clifford, 1991)
by dividing the number of simulations where an equally or more extreme result was obtained by the total number of simulations run.

[22] Again, when using the absolute difference (rather than the percent difference) between the observed and expected proportions of all-White boards as the dependent measure, we find similar results (see Online Supplement Table S17).

[23] See Online Supplement Table S17 and Figure S8 for results where we do not winsorize the size distribution.

were 45% *fewer* 12-person all-White boards than there would have been if board seats were allocated to existing directors in a race-blind lottery.

Insert Figure 4 about here

Insert Table 3 about here

Robustness checks. To confirm that our results were not an artifact of our simulation strategy, we conducted placebo simulations with a variable that we would not expect to show the same effects (following Chang et al., 2019; details in Online Supplement). In our placebo simulations, we reran our analysis but focused on a meaningless characteristic of board members (rather than race or gender): whether their ages ended with an arbitrary digit in 2018 (e.g., whether the board members were 42, 52, 62, etc. in 2018). We defined homogeneous boards as boards that contained no such members. As expected, board size was no longer a significant predictor of the difference between the observed and expected proportions of homogeneous boards on this dimension, suggesting that our results with respect to gender and race are not an artifact of our simulation method or analysis strategy (see Online Supplement Figures S9-S10).

As an additional robustness check, we also reran our simulations within individual industries. Our results were robust across industries for both gender and race (see Online Supplement Tables S18-S19), suggesting that these effects are not driven by particular industries.

Study 4 Discussion

Study 4 extends our experimental findings from Studies 1-3 and tests our theorizing about the importance of group size for diversity-related selection decisions in an important field setting. In Study 4A, we find that larger all-male boards were more likely to diversify by adding female members to their ranks relative to smaller homogeneous boards (Hypothesis 2), but we find only weak evidence of a similar pattern for all-White boards. In Study 4B, we find that among larger boards, all-male and all-White boards were significantly underrepresented relative to chance expectations, and this underrepresentation of homogeneity increases as a function of board size (Hypothesis 4). This means that

even in a highly consequential field setting, despite the general prevalence of homogeneous groups in many organizations—and indeed the overrepresentation of small homogeneous boards that we document in the S&P 1500—there is a scarcity of large homogeneous corporate boards. This suggests more strategic avoidance of homogeneity by corporate boards as their size grows. In other words, Study 4B suggests that the size of a homogeneous group may be an important enough factor to change substantive selection decisions "in the wild."

General Discussion

Across three experiments and an archival study of U.S. corporate boards from 2007-2018, we explore when and why homogeneous groups choose to diversify. In Studies 1 and 2, we manipulate the size of a homogeneous group and demonstrated that a group's size has a causal effect on decision-makers' likelihood of diversifying an all-male or all-White group. In Study 3, we test the mechanisms underlying these findings and showed that this effect is mediated by perceptions of larger homogeneous groups as (i) more likely to be the product of an unfair selection process; (ii) less diverse; and (iii) more likely to face diversity-related impression management concerns. Finally, in Study 4, we move to the field to establish the external validity and magnitude of these findings. Study 4 shows that for each additional director on a homogeneous board, boards were 1-2 percentage points more likely to diversify their ranks by adding at least one underrepresented member in the year ahead. Moreover, as corporate board size increases, we show that all-male and all-White boards become increasingly underrepresented relative to expectations, suggesting greater strategic avoidance of homogeneity in larger groups.

Theoretical and Practical Implications

Our work makes several key contributions to the diversity literature. First, we shed light on when and why homogeneous groups are more likely to diversify. Homogeneous teams are still common in many organizational settings, limiting intergroup contact and exposure to counter-stereotypical exemplars. Because such contact and exposure can reduce bias (Finnegan et al., 2015; Lai et al., 2013; Paluck et al., 2019), improving our understanding of the factors that lead homogeneous groups to diversify could be particularly valuable for broader efforts to make organizations more diverse and

inclusive. Our findings suggest that decision-makers will exert more effort to diversify a group when they worry that it was formed through a biased selection process, judge it as lacking diversity, expect it to face sanctions because it is not diverse enough, or (counter to our theorizing) expect a newly-added underrepresented member to wield more influence. These findings suggest that policymakers seeking to increase diversity in organizations may be able to advance their objectives not only by criticizing a lack thereof, but also by calling attention to possible bias in selection processes, making salient the possibility of backlash for lacking diversity, or highlighting the positive influence that underrepresented members might wield if hired.

Second, we shed light on the influence of a group's size on hiring decisions and group perceptions. In so doing, we illuminate how a fundamental feature of all groups shapes diversity-related outcomes. At first blush, groups with equivalent levels of diversity might seem indistinguishable from one another, and prior conceptualizations of diversity would treat homogeneous groups of different sizes as indistinct (Harrison & Klein, 2007; Meyer, 2017). However, we demonstrate that this view is too simplistic: people perceive, judge, and treat homogeneous groups differently depending on their size. In addition, group size influences whether and how aggressively decision-makers will exert efforts to diversify homogeneous groups. In the field, we also document a surprising underrepresentation of large homogeneous groups and an overrepresentation of small homogeneous groups on corporate boards, suggesting that group size may influence decision-makers' perceptions enough that these high-profile groups exert greater effort to avoid homogeneity the larger they become.

Our work also helps to integrate theory and insights from the judgment and decision-making literature into the diversity literature. We draw upon a core principle of judgment and decision-making research—that people form their beliefs in an intuitively Bayesian manner (Dawes, 1989; Gigerenzer & Hoffrage, 1995; Moore & Healy, 2008; Slovic & Lichtenstein, 1971)—and demonstrate that this has important implications for understanding diversity perceptions and forecasting group hiring decisions. We theorize that groups can be viewed as collections of hiring decisions, which means evaluators receive a stronger signal about the way those decisions are made when evaluating larger groups than smaller groups

(Bohnet et al., 2016). Our work suggests that diversity scholars should continue to explore how the size of a group influences diversity-related perceptions and selection decisions, rather than simply holding it constant in experiments or treating it as an ancillary control variable in their studies. Moreover, the size of a group is just one potential source of information for evaluators who update their beliefs in a Bayesian manner, and other features of groups that convey relevant information also merit further exploration (e.g., the demographic composition of the members, or the distribution of positions of power within the group).

Practically, our theory and findings suggest that decision-makers are unlikely to worry about exerting effort toward recruiting and hiring women and racial minorities to join homogeneous groups when those groups are small. This may explain the patterns we find in Study 4B, wherein large homogeneous groups are surprisingly scarce (suggesting a relative over-investment of effort to diversify those groups) while small homogeneous groups are surprisingly abundant (suggesting a relative under-investment of efforts to diversify those groups). Unfortunately, this pattern may have negative consequences. For instance, a startup founded by two White men may not worry about diversifying until the founders realize that all five of their new hires are also White men. However, past research suggests women and racial minorities may be less willing to join larger homogeneous groups than smaller homogeneous groups (Avery & McKay, 2006; Thomas & Wise, 1999). Thus, efforts to diversify homogeneous groups may begin or intensify as they grow in size, but those very groups may be less attractive to women and racial minorities *because* they are large and homogeneous. This suggests that, in some cases, homogeneous organizations might not worry about diversifying until it's "too late."

Extending Our Theory beyond the Study of Homogenous Groups

Although our work focuses on homogeneous groups (comprised of members of historically dominant groups in American society), our theorizing can naturally be extended to the study of non-homogeneous groups. For example, when considering diverse groups (e.g., groups that have achieved gender parity), our theorizing suggests that larger groups still provide stronger signals to evaluators, but now there is more evidence that the group's diversity (rather than its lack thereof) is a meaningful signal and that it effectively represents (rather than diverges from) the underlying population. We would expect

this to be reflected in the perceptions formed about diverse groups such that larger diverse groups are more likely to be viewed as (i) the product of a fair selection process; (ii) actually diverse; and (iii) able to avoid diversity-related impression management concerns. Overall, we would predict that decision-makers will be less inclined to suggest diversifying larger diverse groups (compared with smaller diverse groups) by adding another underrepresented member.

In a supplemental study (see Study S3 in Online Supplement), we conducted an experiment to test this theory. Participants were asked to evaluate two work groups within a hypothetical organization. All participants were shown a group with 2 members and a group with 8 members, and we randomly assigned participants to evaluate either homogeneous all-male groups or gender-diverse groups (with 50% women and 50% men). First, we replicated the patterns from our previous studies in which participants evaluated all-male groups: compared to the 2-person homogeneous group, participants judged the 8-person homogeneous group as (i) having a greater need to hire a woman as the next member, (ii) less likely to have employed a fair hiring process, (iii) less diverse, and (iv) more likely to face impression management concerns. However, as we theorized, this pattern reversed when participants were evaluating diverse groups with 50% women. Under these circumstances, compared to the 2-person diverse group, participants judged the 8-person diverse group as (i) *less* in need of a female hire, (ii) *more* likely to have a fair hiring process, (iii) *more* diverse, and (iv) *less* likely to face impression management concerns. These supplemental findings illustrate that our theorizing generalizes beyond homogeneous groups. It would be valuable for future work to further expand upon these findings, for example by testing how varying group size influences diversity-related perceptions and decisions in groups with some limited diversity (e.g., among groups that are all-male except for a token female member).

Limitations and Future Directions

We use a multi-method approach to test our theory, combining field data analysis with online experiments to examine our predictions in studies with both strong internal validity (Studies 1-3) and external validity (Study 4). Moreover, each of our studies uses a different decision environment, which helps (i) establish the generalizability of our findings and (ii) confirm they are not an artifact of one

particular choice environment. However, an important limitation of our methods is that our experiments only examine decisions made by individuals, while our field data reflect corporate board director selection decisions made in a more complex environment with multiple stakeholders weighing in on hires. Moreover, while our experiments test a variety of choice environments and even involve real recommendations in one case (Study 2), they are still low in external validity.

Our field data are also drawn from a single (albeit important) organizational context, so it would be valuable for future research to test whether our findings generalize to other organizational settings. Finally, given that our field data involves many repeated observations from the same firms over time, and that the effect sizes we observe are relatively small, we do not have adequate statistical power to robustly test for interactions with our hypothesized mechanisms in our field data. Although our controlled experiments provide support for our hypothesized mechanisms, future work leveraging larger sample sizes to explore mechanism evidence in the field would be valuable.

Our work also focuses primarily on how the size of a group impacts how a group is perceived and who is added next to the group. It would be valuable for future work to examine other organizationally relevant outcomes, such as how the size of a group can influence the *experience* of being a token in an otherwise homogeneous group (Watkins et al., 2019). The experience of joining a homogeneous group and becoming a token or "solo" may be more aversive for women and racial minorities in larger groups, where they may feel particularly isolated and have more difficulty forming friendships (Ozcelik & Barsade, 2018). Becoming a token in a larger group might also negatively impact someone's organizational voice (Bowen & Blackmon, 2003); indeed, we find that people expect tokens to wield less influence in larger homogeneous groups than in smaller ones. Bayesian reasoning and worse experiences in larger, mostly homogenous groups might also lead women and racial minorities to more strongly believe that organizational decision-makers in those larger groups exhibit identity-based biases. Thus, future research could explore how the size of a homogeneous group influences its attractiveness to underrepresented minorities deciding between workplaces (Newburry, Gardberg, & Belkin, 2006). Of course, any new member of a group should expect to wield less influence when they are more

outnumbered. An interesting open question is whether the reduction in perceived influence is *greater* for members of underrepresented groups, as they face the risks of being tokenized on top of being outnumbered (Kanter, 1977; MacCorquodale & Jensen, 1993; Watkins et al., 2019).

Another set of questions that future research might explore is whether evaluators' perceptions of diverse groups are accurate and whether this varies by group size and composition. While the mechanisms that we theorize underlie the effect of group size on diversification decisions are all subjective perceptions, two of the constructs (the perceived fairness of a group's selection process and the perceived amount of influence wielded by a newly added underrepresented member) are more likely to have a "correct" answer than the rest. For example, it is mathematically less likely for a selection process that is unbiased with respect to gender to generate an all-male group as the size of the group increases. Thus, the fairness of a group's selection process is easier to objectively quantify, than, say, the perceived diversity of a group, which can vary across evaluators (Abascal, Xu, & Baldassarri, 2021; Unzueta & Binning, 2012).

One finding that contradicted our theorizing was that participants in Study 3 were less willing to diversify homogeneous groups when they believed a newly-added, underrepresented member would wield less influence. These results suggest that study participants expected homogeneous groups to gain value from diversifying. One explanation for this finding is that people expect homogeneous teams to primarily incur benefits from adding underrepresented members, contrary to our theorizing. Previous work has shown that diversifying groups can have various benefits, such as improving team performance and creativity, increasing members' willingness to express dissenting ideas, boosting the quality of majority group members' judgments, and adding unique information and perspectives to a group (Herring, 2009; McLeod, Lobel, & Cox Jr., 1996; Phillips, 2003; Phillips et al., 2004; Phillips & Loyd, 2006; Richard et al., 2007; Sinaceur et al., 2010). We theorized that people might see diversity as also having accompanying costs (Mannix & Neale, 2005; van Knippenberg & Schippers, 2007), and that (biased) decision makers might find it more palatable to add underrepresented group members to teams when they would wield less influence—capitalizing on the impression management benefits of diversity

while minimizing its anticipated "costs." However, participants in our study did not conform to our expectations. They appear to have expected homogeneous groups to benefit more from adding an underrepresented member to their ranks (e.g., adding a woman to an all-male team) if the underrepresented member could exert *more* influence. Future research replicating and expanding upon this pattern would be valuable.

Finally, our work focuses on measuring (Studies 4A-4B) and manipulating (Studies 1-3) the *actual* size of a group and the consequences of this size for diversification decisions. Since actual group size is generally a given in organizations, to capitalize on the growing appeal of diversification as group size increases, it may be possible to change how large a group "feels" in order to kick-start efforts toward diversification. For example, a homogeneous group could be made to "feel" larger by comparing it to smaller reference groups (Frederick & Mochon, 2012; Harris & Speekenbrink, 2016). This, in turn, might influence people's beliefs about that group (Schlueter & Scheepers, 2010) and lead decision-makers to prioritize adding a woman or minority to the group (a hypothesis that would be valuable to test in future research). For example, if there are two homogeneous teams of different sizes in an organization, then using the smaller team as a reference group and making its homogeneity salient to make the other team "feel" bigger might influence decision-makers' hiring decisions for the larger team.

Conclusion

Our work sheds light on when and why homogeneous groups are likely to diversify. We present a Bayesian reasoning framework to explain how a group's size affects perceptions of the group and decisions about who to hire or promote to join it. In doing so, we illuminate how beliefs about a group's composition and selection processes can drive decisions to diversify. We find consistent evidence across three experiments and a field study that decision-makers work harder to diversify larger homogeneous groups. We also document a natural outgrowth of this fact in the context of S&P 1500 corporate boards: larger, homogeneous groups are unusually underrepresented relative to expectations, suggesting that organizations work harder to avoid homogeneity in larger groups than smaller ones. By integrating insights from the judgment and decision-making literature and highlighting how a fundamental feature of

all groups can influence diversity-related selection decisions, we provide new insights into how organizations can increase their diversity and open new avenues for diversity scholarship.

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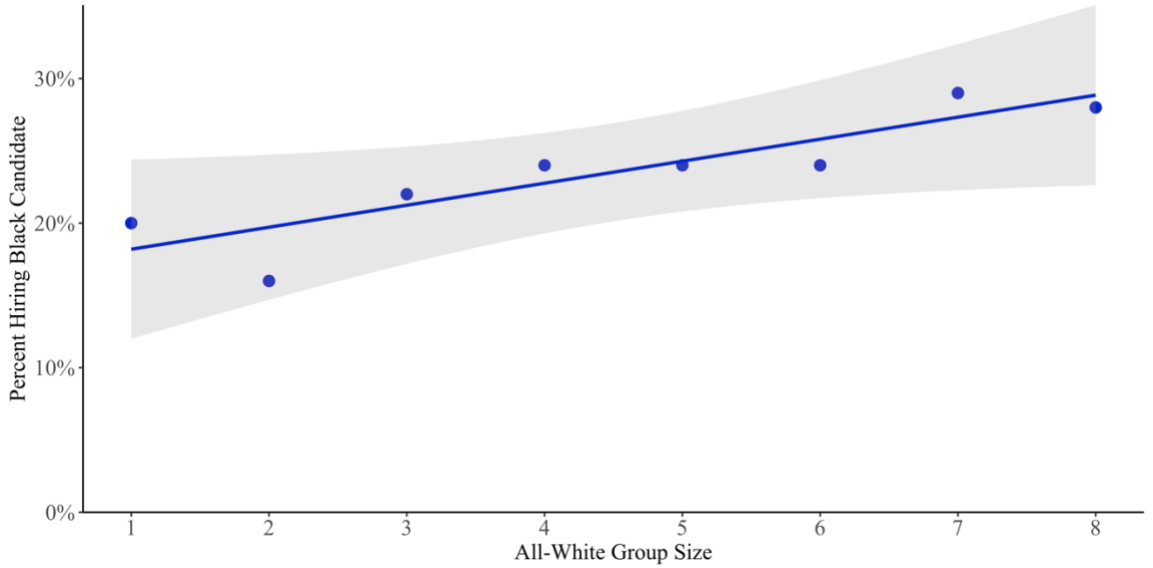
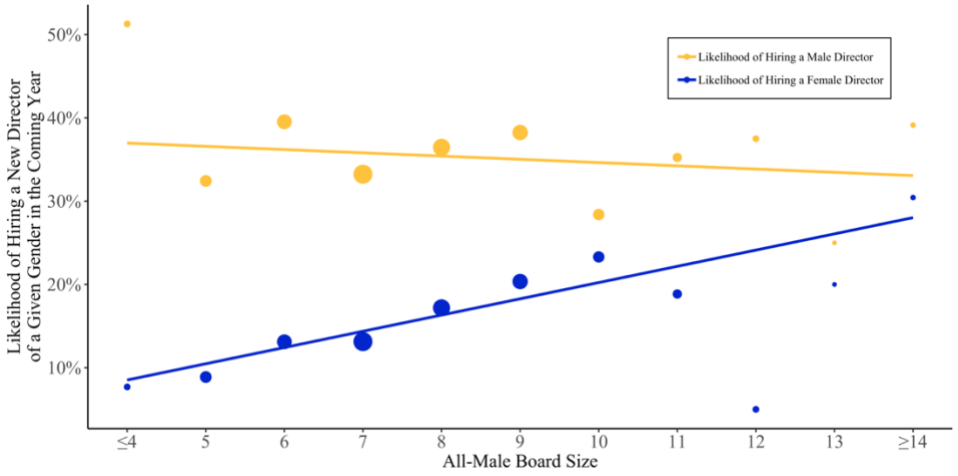
FIGURE 1
Likelihood of Hiring a Black Candidate as a Function of the Randomly Assigned Size of the All-White Group He Would Be Joining in Study 1



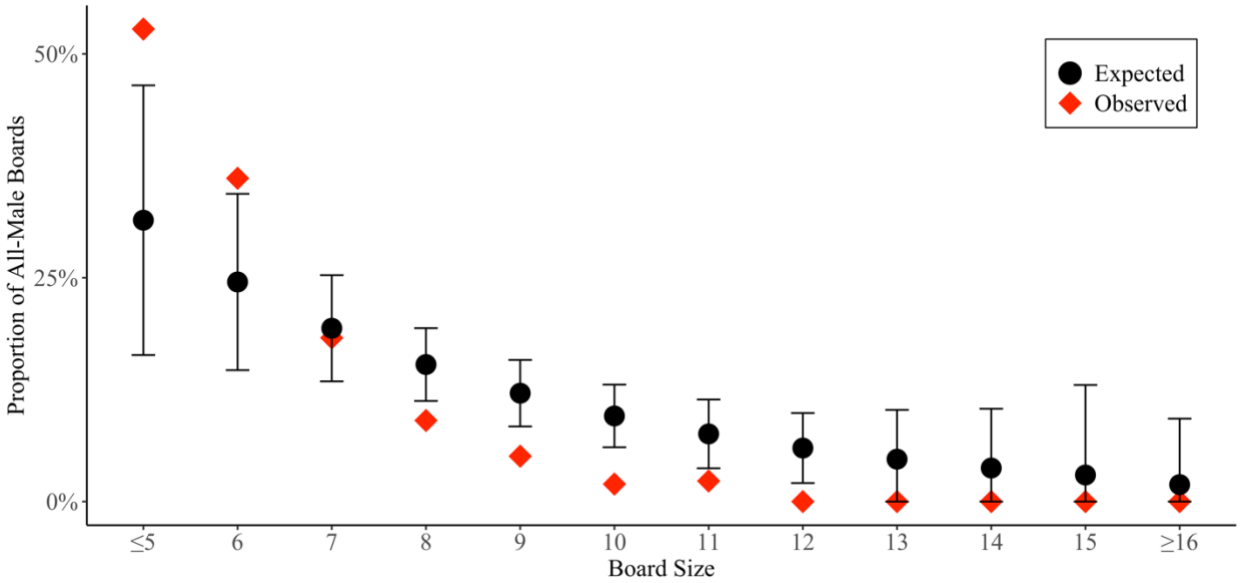
Notes. Dots represent the raw proportions of participants hiring the Black candidate across conditions. The line represents the fitted linear regression line from the analysis described in-text. The shaded region represents a 95% confidence interval.

FIGURE 2
From 2007-2018, Larger All-Male Boards Were More Likely Than Smaller All-Male Boards to Add Women (But Not Men) to Their Ranks in a Given Year



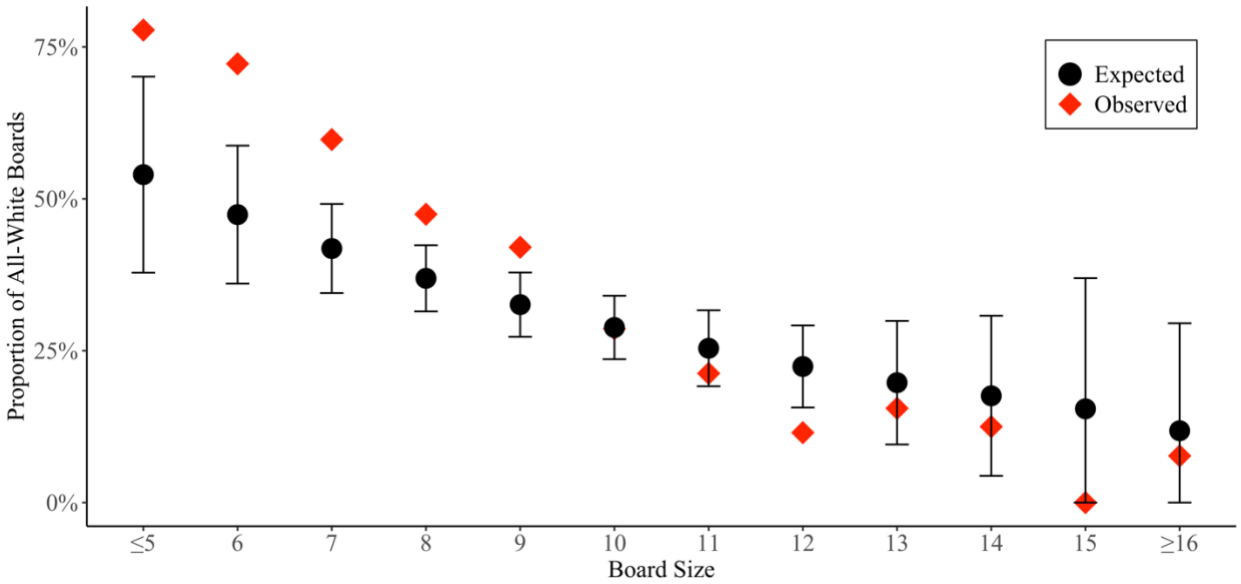
Notes. Dots represent the proportions of all-male board-year observations for which at least one new female director (blue) or new male director (yellow) was added in the following year, across board sizes, and are scaled based on relative sample size. The lines represent fitted linear regression lines predicting the likelihood of hiring a female member (blue line) or male member (yellow line) based on the size of the all-male board.

FIGURE 3
Larger All-Male Boards Are Increasingly Underrepresented Relative to Expectations in the S&P 1500 in 2018



Notes. This figure depicts the expected proportions of all-male boards based on Monte Carlo simulations and the observed proportions of all-male boards. Error bars depict 95% confidence intervals.

FIGURE 4
Larger All-White Boards Are Increasingly Underrepresented Relative to Expectations in the S&P 1500 in 2018



Notes. This figure depicts the expected proportions of all-White boards based on Monte Carlo simulations and the observed proportions of all-White boards. Error bars depict 95% confidence intervals.

TABLE 1
Larger All-Male Boards Are More Likely to Add Women to Their Ranks

	Dependent Variable: Woman Added to All-Male Board					
	Model 1: OLS Regression	**Model 2: Logistic Regression**	**Model 3: OLS Regression**	**Model 4: Logistic Regression**	**Model 5: OLS Regression**	**Model 6: Logistic Regression**
All-Male Board Size	0.019***	0.141***	0.009*	0.059^{+}	0.021***	0.171***
	(0.004)	(0.027)	(0.004)	(0.035)	(0.004)	(0.032)
Control Variables?	No	No	Yes	Yes	Yes	Yes
Omitted Correlated Control Variables?			No	No	Yes	Yes
Observations	3,593	3,593	3,593	3,593	3,593	3,593
R^2 (OLS)/ McFadden's pseudo-R^2 (Logit)	0.008	0.009	0.111	0.132	0.079	0.093

Notes. This table shows results from ordinary least squares regressions and logistic regressions predicting whether all-male boards in a given year added at least one woman to their board in the following year. Standard errors, clustered at the firm level, are in parentheses. When controls are present, the regressions include a firm's market capitalization in a given year, a firm's return-on-assets in a given year, a firm's logged total assets in a given year, a firm's 1-year total-shareholder-returns in a given year, a firm's market-to-book ratio in a given year, a firm's Tobin's Q in a given year, a firm's number of employees in a given year, a firm's level of institutional ownership in a given year measured using percentage of shares owned by institutions, the logged compensation of a firm's CEO in a given year, the proportion of a firm's board members who are independent in a given year, a firm's board's classification (i.e., whether its members are elected to terms that expire in different years), whether a firm's board has a majority voting system, a firm's board's age diversity as measured by the standard deviation of all members' ages in a given year, a firm's board's tenure diversity as measured by the standard deviation of all members' tenure on the board in a given year, fixed effects for calendar year, and fixed effects for industry that a firm belongs to. When omitting correlated control variables, we excluded the following: firm's market capitalization, firm's logged total assets, firm's Tobin's Q, firm's number of employees, firm's CEO's logged compensation, an indicator for firms in the Information Technology industry, and an indicator for firms in the Financials industry.

$^{+}$ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

TABLE 2
Larger All-Male Boards Are Not More Likely to Add Men to Their Ranks

	Dependent Variable: Man Added to All-Male Board					
	Model 1: OLS Regression	**Model 2: Logistic Regression**	**Model 3: OLS Regression**	**Model 4: Logistic Regression**	**Model 5: OLS Regression**	**Model 6: Logistic Regression**
All-Male Board Size	-0.004	-0.017	-0.017**	-0.076**	-0.008	-0.035
	(0.005)	(0.023)	(0.006)	(0.028)	(0.006)	(0.026)
Control Variables?	No	No	Yes	Yes	Yes	Yes
Omitted Correlated Control Variables?			No	No	Yes	Yes
Observations	3,593	3,593	3,593	3,593	3,593	3,593

R^2 (OLS)/ McFadden's pseudo-R^2 (Logit)	0.000	0.000	0.020	0.026	0.016	0.020

Notes. This table shows results from ordinary least squares regressions predicting whether all-male boards in a given year added at least one man to their board in the following year. Standard errors, clustered at the firm level, are in parentheses. When controls are present, the regressions include a firm's market capitalization in a given year, a firm's return-on-assets in a given year, a firm's logged total assets in a given year, a firm's 1-year total-shareholder-returns in a given year, a firm's market-to-book ratio in a given year, a firm's Tobin's Q in a given year, a firm's number of employees in a given year, a firm's level of institutional ownership in a given year measured using percentage of shares owned by institutions, the logged compensation of a firm's CEO in a given year, the proportion of a firm's board members who are independent in a given year, a firm's board's classification (i.e., whether its members are elected to terms that expire in different years), whether a firm's board has a majority voting system, a firm's board's age diversity as measured by the standard deviation of all members' ages in a given year, a firm's board's tenure diversity as measured by the standard deviation of all members' tenure on the board in a given year, fixed effects for calendar year, and fixed effects for industry that a firm belongs to. When omitting correlated control variables, we excluded the following: firm's market capitalization, firm's logged total assets, firm's Tobin's Q, firm's number of employees, firm's CEO's logged compensation, an indicator for firms in the Information Technology industry, and an indicator for firms in the Financials industry.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

TABLE 3
Larger All-White Boards Are More Likely to Add Non-White Directors to Their Ranks

	Dependent Variable: Non-White Director Added to All-White Board					
	Model 1: OLS Regression	**Model 2: Logistic Regression**	**Model 3: OLS Regression**	**Model 4: Logistic Regression**	**Model 5: OLS Regression**	**Model 6: Logistic Regression**
All-White Board Size	0.009*** (0.002)	0.127*** (0.028)	0.002 (0.002)	0.033 (0.037)	0.005* (0.002)	0.095** (0.032)
Control Variables?	No	No	Yes	Yes	Yes	Yes
Omitted Correlated Control Variables?			No	No	Yes	Yes
Observations	4,350	4,350	4,350	4,350	4,350	4,350
R^2 (OLS)/ McFadden's pseudo-R^2 (Logit)	0.004	0.008	0.043	0.089	0.035	0.065

Notes. This table shows results from ordinary least squares regressions predicting whether all-White boards in a given year added at least one non-White director to their board in the following year. Standard errors, clustered at the firm level, are in parentheses. When controls are present, the regressions include a firm's market capitalization in a given year, a firm's return-on-assets in a given year, a firm's logged total assets in a given year, a firm's 1-year total-shareholder-returns in a given year, a firm's market-to-book ratio in a given year, a firm's Tobin's Q in a given year, a firm's number of employees in a given year, a firm's level of institutional ownership in a given year measured using percentage of shares owned by institutions, the logged compensation of a firm's CEO in a given year, the proportion of a firm's board members who are independent in a given year, a firm's board's classification (i.e., whether its members are elected to terms that expire in different years), whether a firm's board has a majority voting system, a firm's board's age diversity as measured by the standard deviation of all members' ages in a given year, a firm's board's tenure diversity as measured by the standard deviation of all members' tenure on the board in a given year, fixed effects for calendar year, and fixed effects for industry that a firm belongs to. When excluding correlated control variables, we omitted the following: firm's market capitalization, firm's logged total assets, firm's Tobin's Q, firm's number of employees, board's tenure diversity, and an indicator for firms in the Financials industry.
$^{+}$ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

TABLE 4
Larger All-White Boards Are Not More Likely to Add White Directors to Their Ranks

	Dependent Variable: White Director Added to All-White Board					
	Model 1: OLS Regression	**Model 2: Logistic Regression**	**Model 3: OLS Regression**	**Model 4: Logistic Regression**	**Model 5: OLS Regression**	**Model 6: Logistic Regression**
All-White Board Size	0.001 (0.004)	0.006 (0.017)	-0.010^{+} (0.005)	-0.039^{+} (0.021)	-0.003 (0.005)	-0.004 (0.018)
Control Variables?	No	No	Yes	Yes	Yes	Yes
Omitted Correlated Control Variables?			No	No	Yes	Yes
Observations	4,350	4,350	4,350	4,350	4,350	4,350
R^2 (OLS)/ McFadden's pseudo-R^2 (Logit)	0.000	0.000	0.013	0.017	0.009	0.012

Notes. This table shows results from ordinary least squares regressions predicting whether all-White boards in a given year added at least one White director to their board in the following year. Standard errors, clustered at the firm level, are in parentheses. When controls are present, the regressions include a firm's market capitalization in a given year, a firm's return-on-assets in a given year, a firm's logged total assets in a given year, a firm's 1-year total-shareholder-returns in a given year, a firm's market-to-book ratio in a given year, a firm's Tobin's Q in a given year, a firm's number of employees in a given year, a firm's level of institutional ownership in a given year measured using percentage of shares owned by institutions, the logged compensation of a firm's CEO in a given year, the proportion of a firm's board members who are independent in a given year, a firm's board's classification (i.e., whether its members are elected to terms that expire in different years), whether a firm's board has a majority voting system, a firm's board's age diversity as measured by the standard deviation of all members' ages in a given year, a firm's board's tenure diversity as measured by the standard deviation of all members' tenure on the board in a given year, fixed effects for calendar year, and fixed effects for industry that a firm belongs to. When excluding correlated control variables, we omitted the following: firm's market capitalization, firm's logged total assets, firm's Tobin's Q, firm's number of employees, board's tenure diversity, and an indicator for firms in the Financials industry.

$^{+}$ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

TABLE 5
Levels of Homogeneity Differ Significantly From Expectations as Board Size Increases

	Dependent Variable: Percent Difference Between Observed and Expected Proportions of Homogeneous Boards	
	Model 1: Gender	**Model 2: Race**
Board Size	-0.148*** (0.023)	-0.113*** (0.018)
Constant	1.027** (0.255)	1.146*** (0.200)
Observations	12	12
R^2	0.805	0.800

Notes. This table shows regression results from ordinary least squares regressions predicting the percent difference between the observed and expected proportions of all-male boards (Model 1) and all-White boards (Model 2)

using data from 2018. Expected proportions were computed using Monte Carlo simulations. Standard errors are in parentheses.
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$