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Going it alone: Competition increases the attractiveness of minority status

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ABSTRACT

Past research demonstrates that people prefer to affiliate with others who resemble them demographically. However, we posit that when competing for scarce opportunities, strategic considerations moderate the strength of this tendency toward homophily. Across six experiments, we find that anticipated competition weakens people's desire to join groups that include similar others. When expecting to compete against fellow group members, women are more willing to join all-male groups and Black participants are more willing to join all-White groups than in the absence of competition. We show that this effect is mediated by the belief that being distinct will lead your performance to stand out. Our findings offer a new perspective to enrich past research on homophily, shedding light on the instances when minorities are more likely to join groups in which they will be underrepresented.

1. Introduction

People often have the opportunity to select the groups they'll join at work and beyond. For example, some organizations have internal talent markets or rotational programs such that employees can sample several teams before choosing one to join. In academic environments, students choose between classes, majors, and research groups at their college or university. More commonly, such choices are inter-organizational: for instance, many people choose between job offers, which typically means selecting between work groups.

While research on organizational attractiveness often focuses on how organizational features and individual attitudes interact to shape people's preferences between jobs (Cable & Judge, 1996; Lievens, Decaesteker, Coetsier, & Geirnaert, 2001; Martins & Parsons, 2007; Turban & Greening, 1997; Turban & Keon, 1993), in this paper, we explore how people choose between groups or teams based on their anticipated coworkers. Specifically, we examine how members of historically underrepresented populations choose between work groups based on both organizational context and work group composition, and we offer a theory challenging the idea that underrepresented group members are universally opposed to being tokens[1] (cf. Duguid, 2011; Umphress, Smith-Crowe, Brief, Dietz, & Watkins, 2007). By more closely examining the preferences and choices of members of historically underrepresented populations (namely women and racial minorities), our work contributes to a richer understanding of diversity in organizations.

Most theory and scholarship about why prospective group members are attracted to one group over another is grounded in research on homophily. Homophily is a term that describes our tendency to join groups composed of people whose beliefs, attitudes, and demographic traits resemble our own (see McPherson, Smith-Lovin, & Cook, 2001 for a review). There is particularly strong evidence of homophily among members of underrepresented populations (Baugher, Varanelli, & Weisbord, 2000; Mehra, Kilduff, & Brass, 1998; cf. Umphress et al., 2007), in part due to the aversive consequences that women and racial minorities face when they are tokens (Cohen & Swim, 1995; Kanter, 1977).

We posit that past research may have overlooked an important moderator of the strength of homophily. Specifically, we focus on the consequences of intra-group competition, or competition against fellow work group members, which is a common feature of organizational life (Scheiber, 2015; Steinhage, Cable, & Wardley, 2017). Work group members frequently compete amongst themselves for promotions, recognition, and bonuses. Any organization with limited opportunities for advancement involves some form of competition against peers, but intra-group competition is particularly common at elite companies, where large numbers of entry-level employees are culled down through consistent cuts until a small number reach senior positions within the firm (Scheiber, 2015).

We theorize that intra-group competition affects which groups women and racial minorities prefer to join by reducing their desire to work with similar others. Competition for scarce recognition gives rise

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[1] As per Kanter's (1977) definition, we consider tokens to be individuals who constitute less than 15% of their group.

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to desires for individuation and differentiation from fellow competitors (Maslach, 1974). Because race and gender are highly salient identities for social categorization (Stangor, Lynch, Duan, & Glas, 1992), the desire to appear different and set oneself apart from competitors may increase the rate at which historically underrepresented minorities in organizations (e.g., female employees, Black employees) prefer to join groups of dissimilar others. In addition, prior work suggests that implicit quotas, which are norms or unstated rules for the number of underrepresented minorities offered jobs or promotions, may dictate whom managers attempt to attract and retain (Chang, Milkman, Chugh, & Akinola, 2019; Dezső, Ross, & Uribe, 2016). If women and racial minorities expect their managers' decisions to be influenced by implicit quotas, they may strategically choose to be tokens in order to increase their chances of success when facing intra-group competition. Finally, across many domains, competition has been shown to increase people's strategic thinking and focus on social comparisons, and it has been shown to reduce their focus on maintaining relationships (Camerer, 2003; Halevy, Cohen, Chou, Katz, & Panter, 2014; Kilduff, 2014). If people anticipate that intra-group competition will damage social relationships, they may prefer to compete against peers they do not expect to befriend (e.g., demographically dissimilar others; Byrne, 1997).

Thus, when competing, women and racial minorities may be more willing to join groups in which they will be tokens for three primary reasons: (1) they believe that, by virtue of being a demographic minority, their performance and point of view will stand out relative to majority group members; (2) they believe that organizations have implicit quotas for demographic minorities and hope to benefit from these quotas; and (3) they want to avoid competition against demographically similar others.

Across a series of six experiments, we show that anticipated intra-group competition influences the groups women and racial minorities choose to join, as predicted. Specifically, we find that competition for scarce opportunities weakens women's and racial minorities' desire to join groups that include similar others, and we present evidence that sheds light on the mechanism responsible for this effect. Our key contributions are to highlight a previously unappreciated moderator of the well-studied preference for homophily — intra-group competition — that is also a common feature of organizational life (Scheiber, 2015; Steinhage et al., 2017) and to explain this phenomenon.

1.1. The desire for similar others in groups

Homophily, defined as the tendency to affiliate with others who have similar beliefs, attitudes, and personal traits (McPherson et al., 2001), is a powerful phenomenon that has been documented across a wide range of contexts and types of relationships (see McPherson et al., 2001 for a review; McPherson & Smith-Lovin, 1987). Past research on homophily suggests that, all else being equal, people are more likely to join groups composed of others who are similar to them than groups composed of dissimilar others.

There is particularly ample evidence that people exhibit homophily when deciding which groups to join or which people to affiliate with in professional settings. For example, studying the decisions of undergraduates tasked with choosing a group to work with on a semester-long project, Baugher et al. (2000) found that self-selected groups were much more similar – or less diverse – with regard to race, gender, and cultural background than would be expected by chance. Similarly, Hinds, Carley, Krackhardt, and Wholey (2000) found that work groups chosen for a four-month software engineering project were also more similar demographically than would be expected by chance. These patterns have also been identified in non-work decisions: McPherson and Smith-Lovin (1987) found people are driven toward homophily in their choice of social organizations and in their choice of friends.

One force behind homophily is the tendency to like people who resemble us (McPherson et al., 2001). Similarity-attraction theory posits that people prefer to affiliate with those who share their attitudes and beliefs (Byrne, 1969; Byrne, London, & Reeves, 1968) or demographic traits (Byrne, 1997; Montoya, Horton, & Kirchner, 2008; Turban, Dougherty, & Lee, 2002). Not only do we have positive affective responses to those who are similar to us, but we expect increased comfort and trust when interacting with them (Baskett, 1974; Byrne, 1969, 1997). People's attitudes toward their work groups are also often consistent with the predictions of similarity-attraction theory. In a survey of employees in a large company, Riordan and Shore (1997) found employees had more positive attitudes toward their work groups when other members of those groups were more demographically similar to them. Both homophily and similarity-attraction theory suggest that, if given the choice, people will be more likely to join groups that include demographically similar others than groups that do not.

While the aforementioned findings and theorizing apply to all people, racial minorities and women have particular reasons to exhibit homophily. For members of these groups, homophily may also be propelled by an aversion to being in the numeric minority. For example, there is evidence that members of historically underrepresented populations feel isolated, hyper-visible, and pressured to conform to stereotypical roles or behaviors when they are in the minority in groups (Chatman, Boisnier, Spataro, Anderson, & Berdahl, 2008; Yoder, 1991). Furthermore, being severely underrepresented in a work group can harm an individual's performance (Thompson & Sekaquaptewa, 2002) and reduce their job satisfaction (Niemann & Dovidio, 1998). Together, these findings suggest that the experience of being a token in a group can be particularly unpleasant and taxing for historically underrepresented minorities.

1.2. The effects of competition on group preferences

Competition has been linked to increased motivation and a focus on winning in past research (Berger & Pope, 2011; Kilduff, 2014; Plass et al., 2013). For example, Berger and Pope (2011) found in laboratory studies that participants who were told they were competing against others persisted longer on tedious tasks. Further, past research has shown that when people in organizations face competition for scarce resources, they are more likely to engage in strategic thinking (Camerer, 2003; Halevy et al., 2014; Ray, King-Casas, Montague, & Dayan, 2009) and to make comparative social judgments in order to evaluate their position and status (Ashmore, Jussim, & Wilder, 2001). Thus, the prospect of intra-group competition (i.e., competition against fellow group members) is likely to encourage people to think strategically and engage in social comparison processes as they consider the best ways to achieve success.

One promising strategy for people to deploy in the face of competition for scarce opportunities may be to attempt to stand out from their peers. Differentiating oneself from others prompts attention and increases perceptions of status, both of which can be beneficial in competitions (Maslach, Stapp, & Santee, 1985; Snyder & Lopez, 2001). Indeed, when competing for rewards, people generally engage in more self-differentiating behaviors (Maslach, 1974). In addition, job candidates often attempt to set themselves apart from others by giving unique answers to traditional interview questions, a strategy that leads to more positive outcomes (Roulin, Bangerter, & Yerly, 2011).

We propose that to stand out from peers, people may elect to join groups where their beliefs, attitudes, and personal traits make them

distinct. When competing, people are more likely to compare themselves to those who resemble them because they perceive similar others to be more appropriate targets for comparison than dissimilar others (Brewer & Gardner, 1996; Duffy, Scott, Shaw, Tepper, & Aquino, 2012; Hoffman, Festinger, & Lawrence, 1954). Shared attributes are even more likely to be a basis for social comparison when these attributes are relatively rare (Kilduff, Elfenbein, & Staw, 2010; Mehra et al., 1998). If people facing competitive pressure believe that evaluators are likely to make comparisons within social categories, they may prefer to surround themselves with dissimilar others to stand out. This may be a wise strategy for members of certain groups: past research has found that women and racial minorities tend to stand out in groups, especially when they are numerically underrepresented (Dovidio, Gaertner, & Saguy, 2008).

We propose that being demographically rare in a group can provide those in the numeric minority with three primary benefits. First, people who are tokens may expect their work and behavior to be more visible to colleagues and evaluators (Kanter, 1977; Watkins, Simmons, & Umphress, 2019), and this increased attention to their work could be seen as beneficial in a competitive context. In an experimental study where women were randomly assigned to task-oriented groups such that they would either be the only female in the group (a "solo") or not, female solos were significantly more likely than female non-solos to expect to stand out in their group (Cohen & Swim, 1995). Furthermore, people expect their perspectives, background, and ideas to be more similar to those who resemble them demographically than those who do not (Dipboye & Colella, 2013; Tajfel & Turner, 1979), so they may expect their performance to be more distinctive and salient to evaluators in work groups in which their social identity is also distinctive and salient. Indeed, in a study of women in state legislatures, token women were found to produce work that was more distinct from that of their coworkers than were non-token women (Bratton, 2005). Thus, women and racial minorities may expect their performance and perspective to be more likely to be noticed when they are tokens in a group.

Second, being a token can be beneficial if managers' decision-making is affected by implicit quotas. Prior research suggests that some organizations have implicit quotas that affect their demographic composition (Chang et al., 2019; Dezső et al., 2016). This means that standing out as one of the only underrepresented minorities in a group could actually improve an individual's access to opportunities, particularly when advancement is competitive. Consider, for example, a woman in a male-dominated, competitive, up-or-out organization who is faced with a choice between joining a work group of all men or a gender-diverse group. If she believes that her organization has an implicit quota for the number of women who will be promoted from each group, she may anticipate that her superiors will be reluctant to promote only men. Thus, it would be strategically beneficial to join an all-male work group, where her token female status increases her chances of earning a promotion. If people believe that managers may be guided by implicit (or explicit) quotas when deciding whom to support or promote, then standing out as one of a few minorities in the running for limited opportunities could be strategically beneficial.

Finally, being a token in a group also means avoiding direct competition with similar peers. Past research has shown that the relationally damaging effects of competition and rivalry tend to be strongest when competing against similar others, and this is especially true for women (Kilduff, 2014; Lee, Kesebir, & Pillutla, 2016). If women and racial minorities expect to get along better with similar others in their organizations, as similarity-attraction theory would predict, they may want to preserve potential relationships with other women or racial minorities, respectively, by avoiding the damaging effects of competition (Lee et al., 2016; Singleton & Vacca, 2007). Instead, they may prefer to compete against people who differ from them demographically (e.g., men, White people), whom they may be more comfortable beating in a competition for a job or promotion. Further, because similar others are more frequent targets for social comparisons (Hoffman et al., 1954) and resources for members of underrepresented populations may feel more limited (Ely, 1994), women and racial minorities may expect demographically similar others to be bigger competitive threats. In fact, such threat responses to potential competition with similar peers have been shown to lead female solos to reject female applicants to preserve their token status and avoid competition with fellow women (Duguid, 2011). They have also been shown to lead women in male-dominated workplaces to avoid relationships with other women to avoid competitive comparisons (Ely, 1994). Thus, women and racial minorities may prefer to compete against men and White people, respectively, because they find competition against similar others more relationally and strategically aversive.

We expect that the effects of intra-group competition on willingness to be in the minority would not extend to men and White people. Due to their frequent majority status in the workplace, dominant group members are less likely to categorize themselves based on their dominant group membership or to consider their dominant demographic characteristic to define their primary identity (McGuire & Padawer-Singer, 1976; McGuire, McGuire, Child, & Fujioka, 1978; Nelson & Miller, 1995). Thus, they may be less likely to consider the demographic identity that has traditionally put them in the majority as a source of distinctiveness that they could leverage in a competitive environment. Furthermore, even when they are in the minority in a group, they may not expect implicit quotas to favor them in a competition given their frequent majority status. Indeed, when dominant group members are in the numeric minority, they tend to be treated differently than non-dominant group members who are in the numeric minority due to their social status and relevant identity-based stereotypes (Crocker & McGraw, 1984; Floge, College, & Merrill, 1986). This suggests that they may not expect managers to evaluate their performance based on implicit quotas, and they are likely to find token status more appealing than minority group members even in non-competitive contexts. Finally, because they are often in the majority in workplace environments, dominant group members are more likely to be comfortable competing against one another and to expect fewer relational costs from competition against demographically similar others (Lee et al., 2016).

In sum, we theorize that women and racial minorities will anticipate benefits from being tokens in a group and that they will find it more attractive to distance themselves from others who share salient identity characteristics when competing for scarce opportunities. We propose that this stems from a belief that being in the minority on a salient identity dimension could help them attain scarce opportunities. This belief — whether due to a perception that it will be easier to differentiate themselves, a sense that they could benefit from implicit quotas, or a belief that competition against same-identity peers will be more relationally damaging — should increase the attractiveness of choosing to be a token or numeric minority in a competitive work group. Taken together, we hypothesize that competition will decrease the tendency for members of historically underrepresented populations to join groups composed of people who share their demographic traits. Further, we predict that this effect will be mediated by (1) a belief that being distinct will allow one's work or performance to stand out from that of competitors; (2) a belief that being one of the only women or racial minorities in a group will allow one to benefit from implicit quotas; and (3) a desire to avoid competition against demographically similar peers.

1.3. Overview of studies

We present six experiments that test our hypotheses about the influence of competition for scarce resources on group preferences. In all of our experiments, we randomly assigned participants to anticipate either competing against other group members for scarce resources (e.g., promotions, bonuses) or not. Then, we let participants choose between joining one of two work groups: a group where they would be underrepresented or a group where they would be surrounded by similar others. In Study 1, we found that female (Study 1A) and Black participants (Study 1B) were more likely to join an all-male group or all-White group, respectively, when competing for scarce resources than in the absence of competition. In Study 2, we disentangled the effects of competition and scarcity to demonstrate that competition drove the preference shift we documented. In Study 3, we investigated the mechanisms underlying this phenomenon. We found that a belief that your contributions would stand out more if you were demographically underrepresented mediated this shift in preferences. In Studies 4 and 5, we extended our findings from scenario studies to incentive-compatible studies in which participants made choices between real groups. Notably, across all of our studies, we found evidence that women and minorities preferred working with similar others regardless of their experimental condition. However, we documented a significant and reliable shift in preferences, such that women and racial minorities facing intra-group competition were more willing to be tokens than those who were not facing competition.

2. Study 1

2.1. Study 1A

In Study 1A, we tested our hypothesis that women would be more willing to join an all-male group when facing the prospect of intra-group competition. Women were asked to choose between joining one of two groups for a summer internship, and the groups differed only in their proportion of female members. Competition was experimentally manipulated by altering the percentage of the interns in each group who could expect to receive a full-time job offer at the end of the summer.

2.1.1. Methods

Participants. 900 U.S. participants were recruited through Amazon Mechanical Turk to participate in a 5–6-minute research study for $0.60. Per our preregistration, we excluded participants who indicated in our survey that they were not women, leaving us with a final sample size of 491 women.

Procedure. This experiment was a two-condition (*competitive* vs. *control*) scenario study preregistered on AsPredicted.org (http://aspredicted.org/blind.php?x=rt44qm).

Participants in our experiment were told to imagine they had been offered a summer internship at an organization and they had to choose which of two different departments to join. They were told that their roles and access to senior colleagues would be the same across departments, so the only difference between the two departments would be their fellow interns. To confirm that all participants were women, participants were then asked to report their gender identity ("Woman," "Man," or "Another identity not listed").

All participants were randomly assigned to one of two experimental conditions: a *competitive* condition or a *control* condition. In the *competitive* condition, participants were told that only 25% of interns would be offered full-time jobs at the end of the summer, so they would be competing intensely against the other interns in the department they chose for a full-time job offer. In the *control* condition, participants were told that almost all interns would be offered full-time jobs at the end of the summer, so they would not be competing against the other interns in the department they selected for a full-time job offer. Participants were then asked to choose between the two departments.

Dependent variable. The dependent variable of interest was the proportion of women in each condition who chose to join the all-male group. The information displayed about each department included the photos, names, and college majors of the other summer interns who would be working in the department (see Appendix Fig. 1 for an example of our stimuli). One department was composed of seven men. The other department was composed of four men and three women; thus, the composition of this group would be 50% female if the female participant joined that department. The photos of interns displayed were gathered from the Chicago Face Database (Ma, Correll, & Wittenbrink, 2015), and college majors and race were matched across groups, such that the racial composition of the groups was the same and the majors were similar (though not identical, in order to reduce suspicion) in both groups. We stimulus sampled both the photographs and the college majors associated with each group, creating a total of six stimuli sets. After choosing a group, participants were asked to answer a free-response question explaining why they had chosen their preferred group. All study materials are available in our Online Supplement.

Manipulation check. As a manipulation check, at the end of our study, participants indicated to what extent they anticipated competing against the other interns in their department for a full-time job on a scale from 1 (Not competing at all) to 5 (Competing very intensely).

2.1.2. Results

Our manipulation appeared to work as intended: on a scale from 1 (Not competing at all) to 5 (Competing very intensely), participants expected to compete against the other interns significantly more in the *competitive* condition ($M_{competitive} = 4.67$, $SD_{competitive} = 0.61$) than in the *control* condition ($M_{control} = 1.57$, $SD_{control} = 0.97$; $t(489) = 42.23$, $p < .001$).

As predicted, women in the *competitive* condition were significantly more likely to choose to join the all-male group (46.1%) than were women in the *control* condition (17.5%), $z = 6.72$, $p < .001$. These results suggest that women's willingness to join all-male groups increased significantly when they expected to face intra-group competition.[2]

2.2. Study 1B

In Study 1B, we extended the results of Study 1A by examining whether they replicated with Black participants instead of women. Specifically, we examined whether Black participants were more willing to join a group whose members were all White when they anticipated competing against other group members for scarce opportunities.

2.2.1. Methods

Participants. To recruit enough Black participants in this experiment to reach our preregistered sample size target, we recruited participants on both Prolific and Amazon Mechanical Turk. In total, 278 Black participants were recruited via these sites to participate in a 5–6 min study. Prolific participants ($N = 104$) were paid $0.70, while Mechanical Turk participants ($N = 174$) were paid $0.60 due to the different pricing thresholds on the two services.

Procedure. This study was a two condition (*competitive* vs. *control*)

[2] Women in Study 1A chose to join the all-male group significantly less than chance in the *control* condition (17.5%), $z = 7.53$, $p < .001$. The rate at which women in Study 1A chose to join the all-male group in the *competitive* condition (46.1%) did not differ significantly from chance, $z = 0.77$, $p = .44$.

scenario study preregistered on AsPredicted.org (http://aspredicted.org/blind.php?x=g3cs9e).

The study design was nearly identical to the design of Study 1A. Participants again were randomly assigned to either a *competitive* or *control* condition and invited to choose which department they would prefer to join at a company where they had been offered a summer internship. However, in this experiment, the racial (rather than gender) composition of the other interns was the primary difference between the two departments. To confirm that all participants were Black, participants were asked about their racial identity (i.e., "White," "Black," "Asian," etc.) instead of their gender identity. As in Study 1A, participants in the *competitive* condition learned that only 25% of interns would be offered full-time jobs at the end of the summer, while those in the *control* condition were told that almost all interns would be offered full-time jobs.

Dependent variable. The dependent variable of interest was the proportion of participants choosing to join the all-White group. When choosing which group to join, participants again were shown the photos, names, and college majors of the other summer interns in each group. Both intern groups included four men and three women. In one group, all interns were White; in the other group, three were Black and four were White, such that the more diverse group would be 50% Black if a participant chose to join it. All study materials are available in our Online Supplement.

Manipulation check. At the end of the study, as a manipulation check, participants indicated to what extent they anticipated competing against the other interns in their department for a full-time job on a scale from 1 (Not competing at all) to 5 (Competing very intensely).

2.2.2. Results

A manipulation check confirmed that our manipulation of intra-group competition was successful: on a scale from 1 (Not competing at all) to 5 (Competing very intensely), participants expected to compete against their fellow interns for jobs significantly more in the *competitive* condition ($M_{competitive}$ = 4.49, $SD_{competitive}$ = 0.82) than in the *control* condition ($M_{control}$ = 1.50, $SD_{control}$ = 0.87; $t(276) = 29.34$, $p < .001$).

Lending additional support to our primary hypothesis, a significantly higher proportion of Black participants chose to join the all-White group in the *competitive* condition (36.6%) than in the *control* condition (19.9%), $z = 2.97$, $p = .003$.[3]

2.3. Discussion

In Study 1, we found that female (Study 1A) and Black participants (Study 1B) were more likely to choose to join a group in which they would be the only person of their gender or race when they expected to compete against other group members for scarce resources than when they did not expect to compete. Of note, neither experiment documented a reversal in preferences: across all conditions in all experiments, we found that participants preferred to join work groups that included similar others. However, we identified a reliable and statistically significant shift in preferences such that when intra-group competition was introduced, people found it more attractive to join groups where they would be in the numeric minority.

Study 1A and Study 1B demonstrate that the effects of competition on group choice generalize to those with different historically underrepresented demographic identities. Importantly, Black Americans and females have different levels of representation in the US workforce and the population at large. In particular, although women are roughly 50% of the US population, Black Americans make up only a little more than 13% of the population. Thus, in our studies, seeing a group with near gender parity might have produced a different reaction than seeing a group with near racial parity. Study 1 demonstrates that in spite of this, our findings generalize. They apply not only across distinct identity groups, but also across identity groups with very different levels of representation in the US population and workforce.

While participants in both Studies 1A and 1B decided whether to be a lone representative of their identity group, in a conceptual replication of Study 1A, we found the same pattern of results when the group with zero women was replaced with a group including one woman (see Study S1 in the Online Supplement). This suggests our phenomenon extends beyond situations in which women and racial minorities expect to be a lone representative of their identity group to situations in which they merely expect to be underrepresented.

One potential concern about Studies 1A and 1B is that they conflated competition with scarcity. That is, the *competitive* condition differed from the *control* condition in two ways: (1) participants were told that their group would be competitive, and (2) they were told that only 25% of their group members (rather than almost all group members) would receive a reward or job. In Study 2, we sought to disentangle the effects of competition for scarce resources from the effects of scarcity alone.

3. Study 2

In Study 2, we sought to separate the effects of reward scarcity from the effects of competition to determine whether our effect is driven by intra-group competition, as we hypothesize, or mere scarcity of rewards.

3.1. Methods

Participants. Five hundred and ninety-two women were recruited for this experiment via Amazon Mechanical Turk.

Procedure. This experiment was a three condition (*competitive* vs. *lottery* vs. *control*) scenario study and was preregistered on AsPredicted.org (http://aspredicted.org/blind.php?x=a647tk).

Participants were asked to imagine that they were working at an organization poised to launch two new products, and special teams had been created to supervise each of the two product launches. They were then asked to make a hypothetical choice between joining one of the two product launch teams at the company. The teams were essentially indistinguishable, except that one was all-male and the other was mixed-gender. All participants were told that regardless of how their team performed as a whole, the organization would conduct an individual performance evaluation at the end of the project.

To confirm that all participants were women, participants were asked to report their gender identity ("Woman," "Man," or "Another identity not listed"). Participants were then randomly assigned to one of three experimental conditions. Participants randomly assigned to the *competitive* condition were told that only 25% of the employees from each team would be chosen based on performance to earn a cash bonus and company recognition, so they would be competing against their teammates for a reward. In the *lottery* condition, participants were told that only 25% of the employees from each team would be chosen based on pure luck of the draw to earn a cash bonus and company recognition, and they would not be competing against their teammates. Thus, the scarcity of rewards was held constant between the *competitive* and *lottery* conditions – 25% of employees from each team would earn a bonus – but the presence of competition was varied. Finally, in the *control* condition, which mirrored the control conditions in prior studies, we eliminated both competition and scarcity by telling participants that

[3] Black participants in Study 1B chose to join the all-White group significantly less than chance in both the *control* condition (19.9%), $z = 5.09$, $p < .001$ and the *competitive* condition (36.6%), $z = 2.16$, $p = .03$.

after the performance evaluation, almost all employees from each team would earn a cash bonus and company recognition, so they would not be competing against their teammates nor would rewards be scarce.

Dependent variable. As in our past studies, our dependent variable of interest was the proportion of female participants in each condition choosing to join the all-male team. Participants were asked to choose between the two product launch teams. The information about each team included a set of professional headshots that were matched on apparent age as well as the names and job positions of the employees on each team. We stimulus sampled by creating three distinct sets of all-male teams and three distinct sets of gender-mixed teams. All study materials are available in our Online Supplement.

Manipulation check. At the end of the study, as a manipulation check, participants indicated to what extent they anticipated competing against the other employees on their team for a bonus on a scale from 1 (Not competing at all) to 5 (Competing very intensely).

3.2. Results and discussion

First, we confirmed that our manipulation was successful: on a scale from 1 (Not competing at all) to 5 (Competing very intensely), participants reported that they expected to compete against their fellow interns for a full-time offer significantly more in the *competitive* condition ($M_{competitive}$ = 4.52, $SD_{competitive}$ = 0.74) than in the *control* condition ($M_{control}$ = 1.53, $SD_{control}$ = 0.88; $t(393) = 36.45$, $p < .001$) or the *lottery* condition ($M_{lottery}$ = 1.54, $SD_{lottery}$ = 0.98; $t(392) = 33.97$, $p < .001$), while expectations of competition in the *control* and *lottery* conditions did not differ ($t(393) = 0.06$, $p = .95$).

As in our prior studies, participants in the *competitive* condition chose to join the all-male group significantly more (22.8%) than participants in the *control* condition (9.1%), $z = 3.59$, $p < .001$. Participants in the *competitive* condition were also more willing to join the all-male group than were participants in the *lottery* condition (12.7%), $z = 2.50$, $p = .012$. Finally, the rate of choosing the all-male team did not differ significantly between the *lottery* and *control* conditions, $z = 0.99$, $p = .32$.[4]

These findings suggest that scarcity alone is not enough to produce our effect. Rather, intra-group competition is necessary to increase women's desire to join an all-male team. However, Study 2 does not help us understand why intra-group competition leads women to be more willing to be tokens. In Study 3, we sought to identify the mechanisms responsible for the effect of intra-group competition on the group selection preferences of women and racial minorities.

4. Study 3

In Study 3, we extended our past studies by delving into the mechanisms responsible for women's and racial minorities' increased willingness to be tokens in competitive contexts. Specifically, we explored the extent to which this effect was driven by (1) a belief that being a token would make an individual's work more unique and more likely to be noticed, (2) a belief that being a token would allow them to benefit from implicit quotas, and (3) a desire to avoid competing against similar others due to the relationally damaging effects of competition.

4.1. Methods

Participants. Three hundred and ninety-six women were recruited for this study via Amazon Mechanical Turk.

Procedure. This study had two experimental conditions (*competitive* vs. *control*) and was preregistered on AsPredicted.org (http://aspredicted.org/blind.php?x=qc52u8).

Study 3 relied on the same paradigm as Study 1A, and again, participants were randomly assigned to either a *competitive* or a *control* condition. As in Study 1A, they were told that they had to choose between two different departments within the same organization for a summer internship and that the only difference between the two departments would be their fellow interns. To confirm that all participants were women, they were then asked to report their gender identity ("Woman," "Man," or "Another identity not listed").

As in Study 1A, participants in the *competitive* condition were told that only 25% of interns would be offered a full-time job at the end of their summer internship, whereas participants in the *control* condition were told that almost all interns would be offered a full-time job. However, unlike Study 1A, after women selected which internship group they would prefer to join (an all-male group or a mixed gender group), we presented them with six questions designed to measure our three hypothesized mediators (with two questions for each mediator). Participants were asked to indicate their agreement with each of the six statements, presented in randomized order, on a scale from 1 (Strongly disagree) to 7 (Strongly agree). For each set of items, we report the Spearman-Brown coefficient.

Mediators. To measure whether participants thought being a different gender from other group members would make their performance stand out, we asked participants to rate their agreement with the statements, "I think my work or performance will be distinct from that of other interns in my department" and "I think I bring a unique perspective to my department" (Spearman-Brown coefficient = 0.57, $p < .001$). As per our preregistration, we averaged these two items to create a measure of participants' performance differentiation considerations.

To measure whether participants thought they might benefit from implicit gender quotas, we asked them to rate their agreement with the statements, "I think managers will want to ensure that at least one woman receives a full-time job from each department" and "I think managers will be reluctant to give a full-time job only to men in each department" (Spearman-Brown coefficient = 0.42, $p < .001$). As per our preregistration, we averaged these two items to create a single measure of participants' implicit quota motives.

Finally, to measure whether participants expected competition against women to be more relationally damaging than competition against men, we asked them to rate their agreement with the statements, "I feel tense competing against women" and "I don't feel as comfortable competing against women as I do competing against men" (Spearman-Brown coefficient = 0.65, $p < .001$). As per our preregistration, we averaged these two items to create a single measure of participants' aversion to competition against similar others.

Dependent variable. As in our past studies, our dependent variable of interest was the proportion of female participants in each condition choosing to join the all-male group. Participants were asked to choose between the two groups. The information about each group included photos, names, and college majors of the interns in each group. We stimulus sampled both the photographs and the college majors of the group members, creating a total of six stimuli sets. All study materials are available in our Online Supplement.

Manipulation check. At the end of our study, as a manipulation check, participants indicated to what extent they anticipated competing against the other interns in their department for a full-time job on a scale from 1 (Not competing at all) to 5 (Competing very intensely).

4.2. Results

As in previous studies, our manipulation was successful: on a scale

[4] Women in Study 2 chose to join the all-male group significantly less than chance in the *competitive* (22.8%), $z = 5.50$, $p < .001$; *lottery* (12.7%), $z = 7.87$, $p < .001$; and *control* (9.1%), $z = 8.81$, $p < .001$ conditions.

from 1 (Not competing at all) to 5 (Competing very intensely), participants expected to compete against their fellow interns for a full-time job offer significantly more in the *competitive* condition ($M_{competitive}$ = 4.62, $SD_{competitive}$ = 0.70) than in the *control* condition ($M_{control}$ = 1.54, $SD_{control}$ = 0.93; $t(394) = 37.30$, $p < .001$). In addition, we replicated our findings from Study 1A: women were more willing to join the all-male work group in the *competitive* condition (37.4%) than in the *control* condition (19.2%), $z = 3.91$, $p < .001$.[5] There was also a significant, positive effect of assignment to the *competitive* condition on participants' belief that their performance or perspective would be distinct from that of fellow group members ($p < .001$). However, assignment to the *competitive* condition had no effect on implicit quota motives or aversion to competing against similar others ($p = .486$ and $p = .133$, respectively).

As per our preregistration, we first tested whether each proposed mechanism independently mediated the relationship between intra-group competition and choice of the all-male group (Preacher and Hayes, 2004). We found that only participants' belief that their performance or perspective would be distinct from that of fellow group members mediated the effect of intra-group competition on willingness to choose the all-male group. First, we documented a significant main effect of assignment to the *competitive* condition on performance differentiation considerations ($b = 0.361$, $SE = 0.107$, $p < .001$). Second, the relationship between performance differentiation considerations and the choice of the all-male group was significant ($b = 0.088$, $SE = 0.019$, $p < .001$). Consistent with our mediation hypothesis, the effect of assignment to the *competitive* condition on study participants' choice to join the all-male group ($b = 0.180$, $SE = 0.045$, $p < .001$) was reduced when controlling for participants' expectation that they would bring a distinct perspective to their chosen group ($b = 0.148$, $SE = 0.044$, $p < .001$). A Sobel test confirmed that this reduction in effect size was significant ($b = 0.032$, $SE = 0.012$, $p = .008$), and a 5000-sample bootstrap analysis (MacKinnon, Fairchild, & Fritz, 2007; Shrout & Bolger, 2002) also produced a 95% bias-corrected confidence interval for the size of the indirect effect that excluded zero (95% CI: [0.013, 0.058]). Neither implicit quota motives (indirect effect b = -0.009, $SE = 0.010$, $p = .408$) nor an aversion to competition against similar others (indirect effect $b = 0.020$, $SE = 0.015$, $p = .176$) significantly mediated the effect of intra-group competition on group choice.

Again following our preregistration, we then tested all three mechanisms simultaneously as mediators of our effect with a 1000 bootstrap sample multiple mediator model (Preacher & Hayes, 2008). When we included all three potential mediators in the bootstrapped mediation model, the results confirmed that performance differentiation considerations significantly mediated the effect of intra-group competition ($b = 0.031$, $SE = 0.012$, $p = .007$; 95% CI: [0.008, 0.054]). Again, neither implicit quota motives (b = -0.003, $SE = 0.005$, $p = .508$; 95% CI: [−0.012, 0.006]) nor an aversion to competion against similar others ($b = 0.020$, $SE = 0.014$, $p = .143$; 95% CI: [−0.007, 0.047]) significantly mediated the relationship between assignment to the *competitive condition* and choosing to be a token woman (the results of this mediation model are depicted in Appendix Fig. 2, and a full correlation table between variables is shown in Appendix Table 1).

4.3. Discussion

Study 3 provides evidence that one reason why women and underrepresented minorities may be more willing to join groups in which they will be tokens when facing competition is that they believe doing so will increase the odds that their work is differentiable from the work of others. Specifically, they believe that being demographically distinct from other group members will allow them to bring a unique perspective to their work, helping them stand out.

Study 3 also shows that implicit quota considerations and the desire to avoid competition against similar others do not mediate women's choice to join groups devoid of other women at a higher rate when they expect to compete with fellow group members. Empirically, this may be because there were no significant differences across conditions in the degree to which women expected managerial decisions to be affected by implicit quotas, and there were no significant differences across conditions in the degree to which women expected competition against fellow women to be more aversive (see Appendix Fig. 2).

While Studies 1–3 established the robustness of our findings and delved into the mechanism responsible for them, they all involved hypothetical scenarios. In our remaining studies, we asked participants to make real, incentive-compatible decisions to replicate our effects and show their generalizability to other settings.

5. Study 4

In Study 4, we extended our findings to participants in an incentive-compatible experiment who expected to interact with their chosen group members on an in-person task. Participants in a laboratory experiment chose which of two groups to join for an in-person brainstorming session, and we randomly assigned them to either anticipate competing with others in their group of choice for public recognition and a cash bonus, or not.

5.1. Methods

Participants. Participants (145 women and 57 men) were recruited at a U.S. university to participate in a one-hour research session that included our experiment. Participants were paid $10 to participate in the session and were told that they could earn a bonus of up to $10 by participating in a follow-up brainstorming session. Unlike past studies, we included both male and female participants in this experiment because both were present in the lab session. However, as in prior studies, our analyses focused on the behavior of female participants.

Procedure. This experiment had two conditions (*competitive* vs. *control*). Prior to the research session, participants were asked to fill out a pre-survey that asked for their name, year in college, a hobby, and a photograph of themselves. They were told that these photos would be used during our laboratory session. Before entering the lab, any participants who had not completed the pre-survey were pulled aside and asked for their name, year in college, and a hobby. If consent was granted, their photo was also taken for use in the laboratory session.

During the experiment, participants were provided with a brief overview of the body positivity movement, a social movement rooted in the belief that all bodies are good bodies and that everyone should be able to achieve a positive body image. They were truthfully told that we were seeking ideas to use in a body positivity campaign at their university and that we would be hosting an in-person brainstorming session at a separate time and place to generate these ideas. Participants were informed that they would work in a group with fellow lab participants at the brainstorming session to develop ideas for a body positivity campaign, but that all group members would submit an independent write-up of their favorite idea. We told participants that the brainstorming session would occur after the lab experiment was over, and they would earn $5 for showing up plus a potential bonus depending on the quality of idea they submitted individually at the end of the brainstorming session. In other words, while the group choice

[5] Women in Study 3 chose to join the all-male group significantly less than chance in both the *control* condition (19.2%), $z = 6.34$, $p < .001$ and the *competitive* condition (37.4%), $z = 2.43$, $p = .015$.

happened on a computer in the lab, the group task was in-person and outside of the lab. All participants, regardless of condition, learned that a real panel of judges would evaluate the idea each individual submitted during the brainstorming session to choose several that would be posted on a real university website, earning the authors of the selected ideas public recognition and a $5 bonus on top of their show-up fee.

After answering several questions about their demographics, participants were assigned to either a *competitive* or *control* condition in this experiment. Participants in the *competitive* condition learned that only 25% of the ideas from each brainstorming group would be selected, so they would be competing against fellow group members for rewards and recognition. Participants in the *control* condition learned that nearly all of the ideas from each brainstorming group would be selected, so they would not be competing against fellow group members. We held these brainstorming sessions as promised and assigned bonuses as described.

Dependent variable. The primary dependent variable of interest was the proportion of women choosing to join the all-male group across conditions. After reading the instructions, participants were asked to choose between two seven-person groups to join for the brainstorming session and were shown photographs and background information (name, year in college, and a hobby) about the other seven people in the two available groups.[6] Participants who indicated that they were women were presented with a choice between a group of only men and another equal-sized group of three women and four men. Participants who indicated that they were men chose between one group of only women and another equal-sized group of three men and four women. As in our prior experiments, we stimulus sampled the photographs, names, class years, and hobbies in each group, creating a total of six stimuli sets (three for men and three for women). Complete study stimuli are available in our Online Supplement.

Manipulation check. At the end of the study, after selecting their group for the brainstorming session, participants completed a manipulation check in which they were asked to answer the following question: "To what extent do you feel like you'll be competing against the other participants in your group for a bonus and recognition?" They were asked to answer this question on a scale from 1 (Not competing at all) to 5 (Competing very intensely).

5.2. Results and discussion

As in previous studies, our manipulation was successful: on a scale from 1 (Not competing at all) to 5 (Competing very intensely), participants expected to engage in significantly more intra-group competition in the *competitive* condition ($M_{competitive}$ = 2.82, $SD_{competitive}$ = 1.08) than in the *control* condition ($M_{control}$ = 1.26, $SD_{control}$ = 0.58; $t(143) = 10.80$, $p < .001$).

We were primarily interested in whether women in the *competitive* condition would be more likely to choose to join the all-male group for the brainstorming session than women in the *control* condition. Thus, we compared the proportion of women choosing the all-male group of students across conditions. Consistent with the results of our scenario studies, women in the *competitive* condition were significantly more likely to join the all-male brainstorming group (23.3%) than were women in the *control* condition (9.7%); $z = 1.97$, $p = .048$.[7]

Although we were primarily interested in the behaviors of women and were underpowered to test the parallel effect among men (N = 57 men), we also explored the impact of competition on men's choices. As noted in our introduction, our theory predicts that men, being dominant group members, should be less likely to show our effect. Indeed, we found no significant differences in the rate at which men in the *competitive* condition chose to join an all-female group (24.1%) as compared to men in the *control* condition (28.6%); $z = 0.08$, $p = .94$. These results provide suggestive evidence that men's decisions to be tokens in groups are relatively unaffected by the presence of intra-group competition.

The results of Study 4 confirm that women in an incentive-compatible context choosing a group for an in-person interaction are still more willing to choose all-male groups when they expect to compete against their fellow group members than when they do not expect to compete. To ensure that these results were not due to the context and population being studied or our use of deception, we next ran an incentive-compatible, non-deceptive study in a different context.

6. Study 5

In Study 5, we sought to replicate the results of Study 4 in a pre-registered, non-deceptive experiment in another setting involving real decisions. Workers on Amazon Mechanical Turk were invited to choose one of two real, digital work groups to join, knowing that they either would or would not compete against their fellow group members for a bonus.

6.1. Methods

Participants. Five hundred and eighty-three women were recruited through Amazon Mechanical Turk to participate in an eight-minute research study in exchange for $0.90 and a potential $0.50 bonus.[8]

Procedure. This was a two condition (*competitive* vs. *control)* experiment preregistered on AsPredicted.org (http://aspredicted.org/blind.php?x=j8vm2h).

Participants in our experiment began by indicating their gender and telling us their preferred nickname and hometown. Participants were then told they would be writing a review for a website along with a group of other MTurk workers and that they would be choosing which of two groups of reviewers to join. The two groups would review different (but very similar) websites and were also composed of different people. Participants were informed that after writing their website review, they would interact with other members of their group. Finally, participants were truthfully told that their review would actually be used to describe the website to a diverse group of consumers and that their reviews would be published along with those of other MTurkers in the group.[9]

Participants were randomly assigned to one of two experimental conditions: a *competitive* condition or a *control* condition. In the *competitive* condition, participants were told that we would select the three best reviews from each reviewer group and that only the participants who wrote those reviews would earn a $0.50 bonus. Thus, they would be competing against the other MTurkers in their group. In the *control* condition, participants were told that we would use all the reviews from each group and that everyone would earn a $0.50 bonus. Therefore,

[6] In order to ensure that participant behavior would not be affected by seeing photos of their friends or acquaintances, the stimuli included the names, years in college, hobbies, and photos of college students or recent graduates from other institutions rather than other members of their study session. In other words, this study involved deception, which was approved by our IRB.

[7] Women in Study 4 chose to join the all-male group significantly less than chance in both the *competitive* (23.3%), $z = 3.18$, $p = .001$ and *control* (9.7%), $z = 5.10$, $p < .001$ conditions.

[8] We collected 630 female participants on MTurk, aiming for 600 participants after exclusions. Ultimately, we ended up with 583 participants after our pre-registered exclusions.

[9] This study did not involve deception; we followed through on all promises made to MTurk workers and they were paired with the group of their choice.

they would not be competing against their fellow group members for a bonus.

Dependent variable. The dependent variable of interest was the proportion of participants who chose to join the all-male group. After reading the task description, participants were asked to choose which of two website-evaluation groups to join. As mentioned previously, the groups would evaluate different (but similar) websites (either Buzzfeed.com, HuffingtonPost.com, Vice.com or Vox.com), and membership in the two groups would not overlap.[10] To facilitate their group selection decisions, participants were shown avatars of other group members (revealing their genders) as well as the nicknames and hometowns of each group member (see Appendix Fig. 3 for an example). Both groups included nine people, and each participant chose between a group composed exclusively of men and a group composed of five men and four women. Complete study stimuli are available in our Online Supplement.

After selecting their group, participants were asked to write a short review of the website associated with their group of choice. They then read a website review written by a fellow group member and provided feedback.

Manipulation check. Finally, at the end of the study, as a manipulation check, participants indicated on a scale from 1 (Not at all) to 5 (Very much) to what extent they felt they would be competing against their fellow group members for a bonus.

6.2. Results and discussion

Our manipulation was again successful: on a scale from 1 (Not at all) to 5 (Very much), participants expected to engage in significantly more intra-group competition in the *competitive* condition ($M_{competitive} = 3.61$, $SD_{competitive} = 1.27$) than in the *control* condition ($M_{control} = 2.16$, $SD_{control} = 1.37$; $t(581) = 13.22$, $p < .001$).

To test our primary hypothesis, we compared the proportion of women in each condition who chose to join the all-male review group. Consistent with our other studies, we found that significantly more women in the *competitive* condition chose to join the all-male review group (41.6%) than in the *control* condition (32.1%); $z = 2.27$, $p = .023$.[11] In other words, when women expected to compete against fellow group members for a monetary bonus, they were more likely to join an all-male group (in which they would be the sole female) than in the absence of competition.

7. General discussion and conclusion

Across six experiments, we show that competition for scarce resources increases the rate at which people from historically underrepresented populations choose to join groups in which they will be tokens. In short, competition serves as a partial counterweight to the well-established tendency toward homophily. We find this pattern for female and Black participants, and it arises in both hypothetical scenario studies and studies involving real, incentivized choices.[12] Our findings suggest that intra-group competition leads to a greater desire to join groups where people believe their work output and ideas will be differentiated from those of their peers, and women and racial minorities anticipate that joining a group where they will have token status makes this more likely.

Our findings add to the relatively limited literature examining how women and racial minorities select their teams and groups at work (cf. Avery & McKay, 2006; Duguid, 2011; McKay et al., 2007; Umphress et al., 2007). We find that competition can shape the willingness of women and racial minorities to work with dissimilar others. Of note, across all of our studies, we see that people prefer to join groups in which they will not be tokens: we demonstrate that the preference for homophily is weakened – but not reversed – when people expect to compete against fellow group members for scarce resources.

In our theorizing, we suggested three potential reasons for women's and racial minorities' increased willingness to be tokens when anticipating intra-group competition. Namely, we hypothesized that this effect might be driven by (1) a belief that being a token would make your perspective and work more unique and therefore more likely to get noticed by decision-makers; (2) a belief that being a token would allow you to benefit from implicit quotas; and (3) an aversion to competition against similar others because of the relationally damaging effects of competition. In Study 3, we found evidence for only the first of these hypothesized mechanisms.

Our work does not examine whether the effects of intra-group competition can actually enhance demographic diversity in organizations. In homogeneous organizations composed primarily of dominant group members, the preferences we document may encourage more women and racial minorities to join when intra-group competition is emphasized; however, in organizations that are already diverse, competitive work groups may be unattractive to minorities. It would be valuable for future work to explore this question and determine the effects of emphasizing intra-group competition on a firm's ability to diversify its workforce.

The results of Study 4 also suggest that majority group members do not show our effect: men are just as likely to choose to be solos when they expect to compete against their fellow group members as when they do not. Given that this finding involved one small ($N = 57$) subgroup in one study (which was originally not intended for analysis), it would be valuable for future work to more thoroughly examine the effects of intra-group competition on dominant group members in well-powered studies. Despite being underpowered, however, these results are consistent with our theorizing: because dominant group members are frequently in the majority, they are less likely to spontaneously categorize themselves based on their dominant identity (McGuire & Padawer-Singer, 1976; McGuire et al., 1978; Nelson & Miller, 1995) and may be less likely to expect to be distinctive or stand out to evaluators due to their identity. Thus, the strategic considerations that Study 3 suggests drive our effect for those used to being underrepresented may not be as salient for those used to being well-represented. These findings add to the literature on the different impacts of competitive environments on majority and minority group members (Flory, Leibbrandt, & List, 2015; Niederle & Vesterlund, 2007).

An important limitation of our studies is that they relied exclusively on data collected in the laboratory and online. As a result, even in our incentive-compatible studies, the groups participants joined only interacted briefly, and the incentives provided were relatively small. Past research suggests that people may behave differently in one-shot and repeated interactions (Bó, 2005; Bornstein, Winter, & Goren, 1996). Thus, future tests of our theories in workplaces or other settings where groups interact repeatedly over extended time intervals and where the incentives available for individual performance are larger would be valuable. Finally, assessing whether the rate at which people opt in to being tokens varies systematically based on their social identity and

[10] We stimulus sampled in this study, and the two websites up for review were randomly selected from a set of four sites: Buzzfeed.com, HuffingtonPost.com, Vice.com, and Vox.com. All groups displayed were composed entirely of prior participants who had reviewed each of the four websites and provided us with their gender, a nickname, and their hometown. In total, there were three different pairs of group stimuli sampled in this study.

[11] Women in Study 5 chose to join the all-male group significantly less than chance in both the *competitive* (41.6%), $z = 2.00$, $p = .046$ and *control* (32.1%), $z = 4.21$, $p < .001$ conditions. In other words, women chose homophily (the diverse group containing similar others) significantly more than chance in all conditions.

[12] For a full summary of our results across studies, see Appendix Table 2.

why would add richness to our understanding of this phenomenon.

An important question raised by this research is whether women and racial minorities are wise to choose to join all-male and all-White groups, respectively, in competitive environments given the potential negative long-term consequences of being a token. Past research has shown that when women and racial minorities are tokens, their performance tends to suffer (Thompson & Sekaquaptewa, 2002), as does their organizational commitment (Niemann & Dovidio, 1998). Furthermore, being a token can harm long-term psychological well-being and feelings of belonging in the workplace (Kanter, 1977; Yoder & Sinnett, 1985). Over time, the perceived strategic value of standing out may be dwarfed by the damaging effects of hyper-visibility and isolation (Cohen & Swim, 1995; Kanter, 1977).

Future studies might test whether demographic minorities anticipate this tension by measuring which groups they believe will lead them to be happiest at work and where they predict having the longest tenure. Employees may strategically choose to join groups in which they will be in the minority when facing the prospect of competition, despite anticipating being happier and remaining longer in groups composed of similar others. Future research could also explore whether an increased desire to be in the numeric minority when competing affects affiliative or collaborative behavior or social cognition after women and racial minorities choose a team.

Furthermore, much of the past literature on the consequences of being a token focuses on situations in which individuals did not actively *choose* to be tokens. It would be valuable for future work to examine whether women and racial minorities who make the active decision to be tokens experience diminished negative effects on their performance and organizational commitment in the long run.

It is also an open question whether choosing to be a token is a wise strategic decision for career advancement. Prior work suggests that tokens feel they have to work harder for promotions and that women who anticipate being tokens perform worse on ability tests than women who anticipate working with other women (Archbold & Schulz, 2008; Keller & Sekaquaptewa, 2008). However, there is some evidence that being one of few underrepresented minorities in a group *does* have the kinds of strategic benefits that participants in our studies appeared to anticipate when they chose which groups to join, particularly in firms that care about diversity. For example, past research has shown that some companies appear to have implicit quotas for the levels of diversity they aim to achieve on top management teams (Chang et al., 2019; Dezső et al., 2016). If there are indeed a fixed number of opportunities for women and racial minorities to advance, then it may in fact be advantageous for them to join groups in which they will have a better chance of "standing out." Furthermore, Leslie, Manchester, and Dahm (2017) have shown that high-potential women receive larger rewards in the workplace than high-potential men precisely because they are in short supply in many firms. Future research that directly explores whether the kinds of decisions made by women and racial minorities in our studies are optimal or sub-optimal would be valuable.

Link to Online Supplement: https://osf.io/j8wnt/?view_only=9d83b69e252b4391b1a6faa01d8c58c7.

Appendix

CRediT authorship contribution statement

Erika L. Kirgios: Conceptualization, Methodology, Investigation, Data curation, Writing - original draft. **Edward H. Chang:** Conceptualization, Methodology, Validation, Writing - review & editing. **Katherine L. Milkman:** Conceptualization, Methodology, Writing - review & editing, Supervision.

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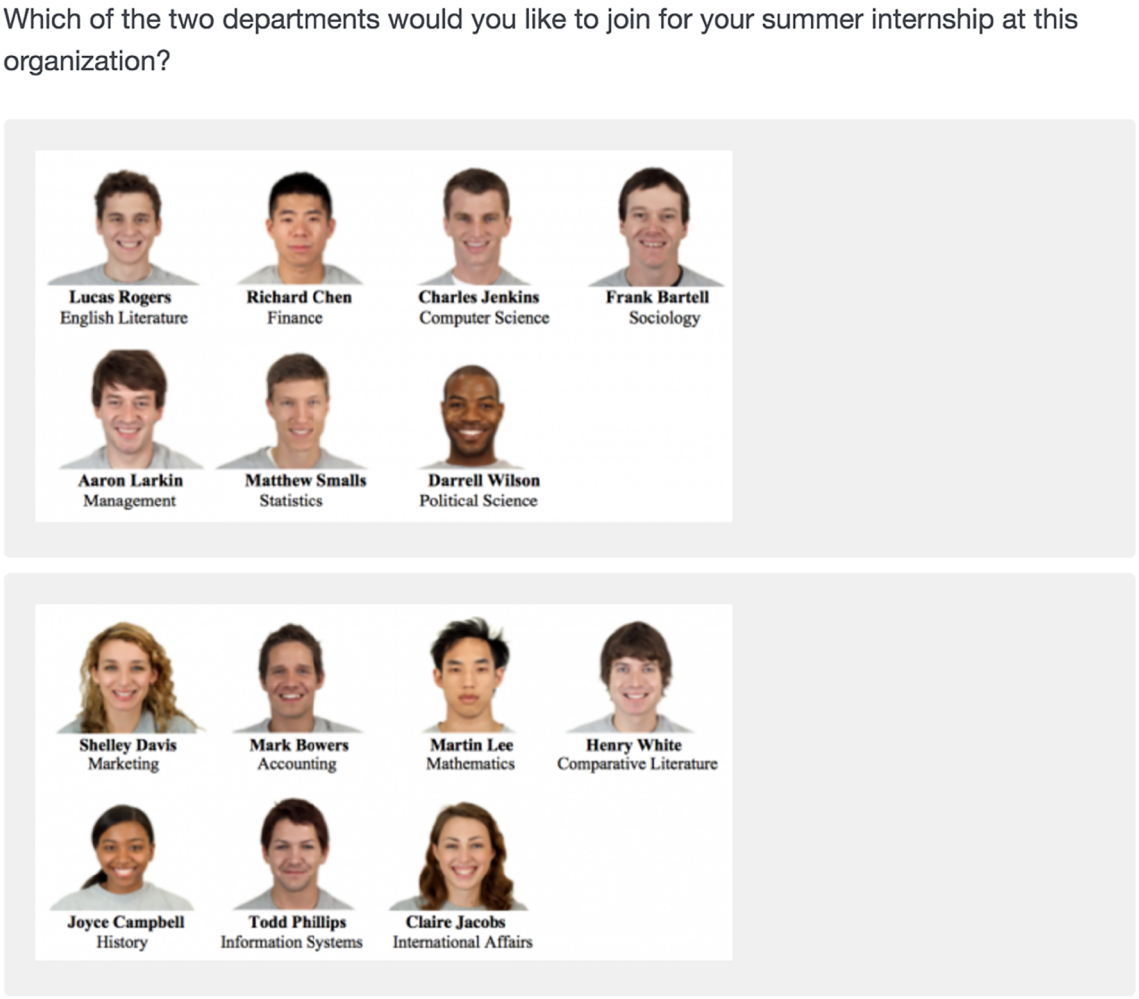
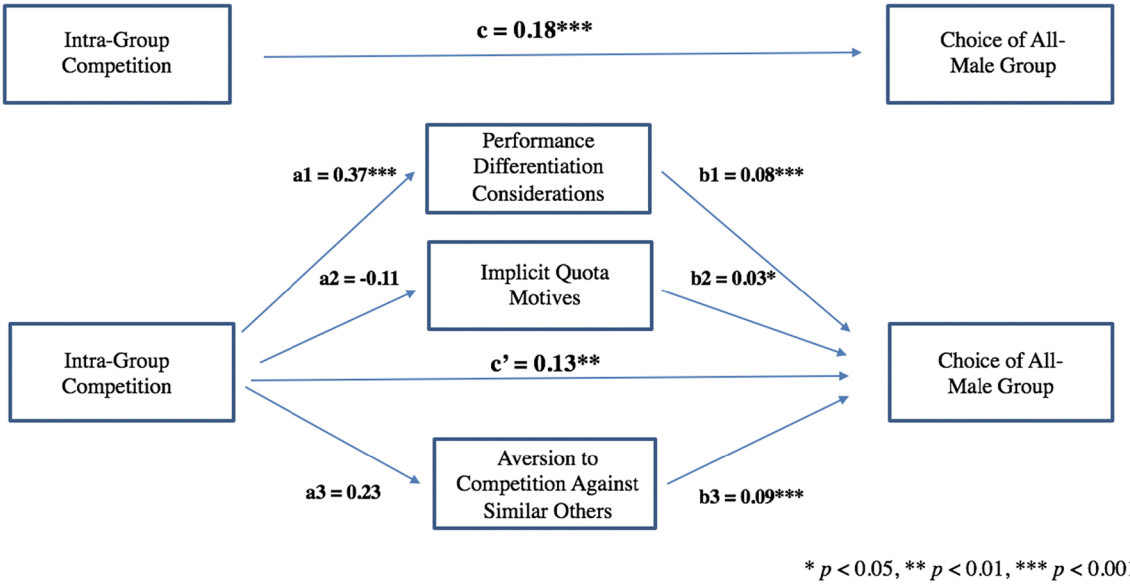
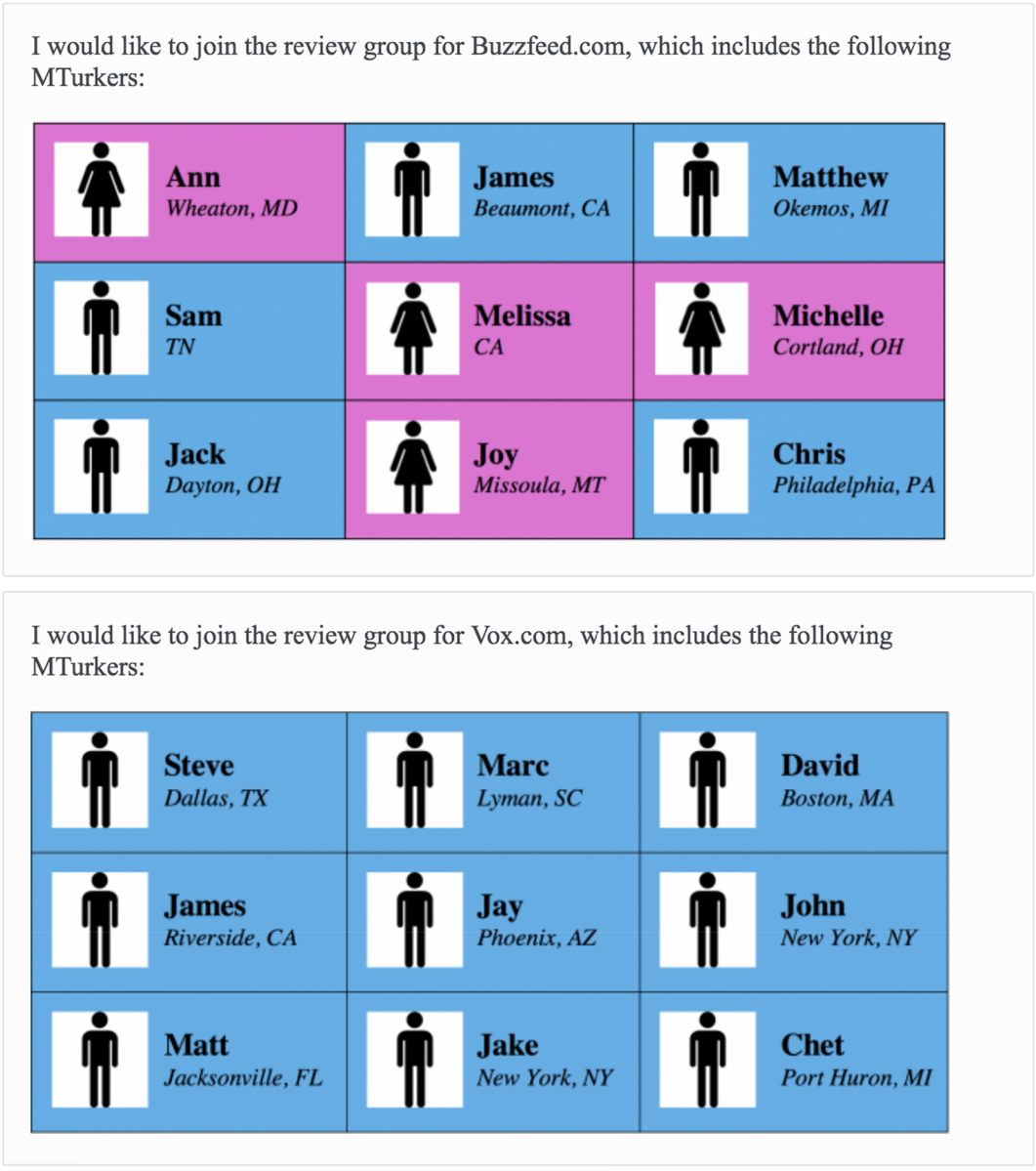


Appendix Figure 1. This is an example of the stimuli displayed to participants in Study 1A. The order of presentation of the two groups was randomized across participants. Racial diversity was held constant across the two groups, and college majors were matched across groups such that the majors in each group were similar but not identical (e.g., Computer Science vs. Information Systems), as presenting groups with identical majors could have appeared suspicious to participants.



Appendix Figure 2. Results of our Study 3 multiple mediator analysis showed that performance differentiation mediated the relationship between intra-group competition and choice of the all-male group. Meanwhile, implicit quota considerations and aversion to ingroup competition did not mediate choice of the all-male group.



Appendix Figure 3. This is an example of the stimuli displayed to participants in Study 5. Here we show two of the groups out of three pairs of groups from which we randomly sampled stimuli. Each group was associated with a randomly selected website from a set of four websites – Buzzfeed, HuffingtonPost, Vice, and Vox. Participants were asked to choose which of the two groups they wanted to join.

Appendix Table 1
Full Correlation Table for Study 3.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1): "I think my work or performance will be distinct from that of other interns in my department"	1.0						
(2): "I think I bring a unique perspective to my department"	0.48***	1.0					
(3): "I think managers will want to ensure that at least one woman receives a full-time job from each department"	0.09	0.18***	1.0				
(4): "I think managers will be reluctant to give a full-time job only to men in each department"	0.14**	0.07	0.43***	1.0			
(5): "I feel tense competing against women"	0.00	−0.02	0.21***	0.27***	1.0		
(6): "I don't feel as comfortable competing against women as I do competing against men"	−0.01	−0.08	0.17***	0.18***	0.62***	1.0	
(7): Choice of the all-male group	0.21***	0.20***	0.15***	0.19***	0.31***	0.28***	1.0

†, *, **, and *** denote significance at the 10%, 5%, 1%, and 0.1% levels, respectively.

Appendix Table 2
Summary Table of Results Across All Studies.

	Total N	Proportion choosing to be tokens in the *competitive* condition	Proportion choosing to be tokens in the *control* condition	*z*-statistic for difference in proportions	*p*-value for difference in proportions
Study 1a	491	0.461	0.175	6.72	< 0.001
Study 1b	278	0.366	0.199	2.97	0.003
Study 2	592	0.228	0.091	3.59	< 0.001
Study 3	396	0.374	0.192	3.91	< 0.001
Study 4	145	0.233	0.097	1.97	0.048
Study 5	583	0.416	0.321	2.27	0.023

References

Archbold, C. A., & Schulz, D. M. (2008). Making rank: The lingering effects of tokenism on female police officers' promotion aspirations. *Police Quarterly, 11*(1), 50–73. https://doi.org/10.1177/1098611107309628.

Ashmore, R. D., Jussim, L. J., & Wilder, D. (2001). *Social identity, intergroup conflict, and conflict reduction.* Oxford University Press.

Avery, D. R., & McKay, P. F. (2006). Target practice: An organizational impression management approach to attracting minority and female job applicants. *Personnel Psychology, 59*(1), 157–187. https://doi.org/10.1111/j.1744-6570.2006.00807.x.

Baskett, G. D. (1974). Interview decisions as determined by competency and attitude similarity. *Journal of Applied Psychology, 57*(3), 343. https://doi.org/10.1037/h0034707.

Baugher, D., Varanelli, A., & Weisbord, E. (2000). Gender and culture diversity occurring in self-formed work groups. *Journal of Managerial Issues, 12*(4), 391–407.

Berger, J., & Pope, D. (2011). Can losing lead to winning? *Management Science, 57*(5), 817–827. https://doi.org/10.1287/mnsc.1110.1328.

Bó, P. D. (2005). Cooperation under the shadow of the Future: Experimental evidence from infinitely repeated games. *American Economic Review, 95*(5), 1591–1604. https://doi.org/10.1257/000282805775014434.

Bornstein, G., Winter, E., & Goren, H. (1996). Experimental study of repeated team-games. *European Journal of Political Economy, 12*(4), 629–639. https://doi.org/10.1016/S0176-2680(96)00020-1.

Bratton, K. A. (2005). Critical mass theory revisited: The behavior and success of token women in state legislatures. *Politics & Gender, 1*(1), 97–125. https://doi.org/10.1017/S1743923X0505004X.

Brewer, M. B., & Gardner, W. (1996). Who is this "We"? Levels of collective identity and self representations. *Journal of Personality and Social Psychology, 71*(1), 83–93. https://doi.org/10.1037/0022-3514.71.1.83.

Byrne, D. (1969). Attitudes and attraction. *Advances in Experimental Social Psychology, 4*, 35–89. https://doi.org/10.1016/S0065-2601(08)60076-3.

Byrne, D. (1997). An overview (and underview) of research and theory within the attraction paradigm. *Journal of Social and Personal Relationships, 14*(3), 417–431. https://doi.org/10.1177/0265407597143008.

Byrne, D., London, O., & Reeves, K. (1968). The effects of physical attractiveness, sex, and attitude similarity on interpersonal attraction1. *Journal of Personality, 36*(2), 259–271. https://doi.org/10.1111/j.1467-6494.1968.tb01473.x.

Cable, D. M., & Judge, T. A. (1996). Person-organization fit, job choice decisions, and organizational entry. *Organizational Behavior and Human Decision Processes, 67*(3), 294–311. https://doi.org/10.1006/obhd.1996.0081.

Camerer, C. F. (2003). Behavioural studies of strategic thinking in games. *Trends in Cognitive Sciences, 7*(5), 225–231. https://doi.org/10.1016/S1364-6613(03)00094-9.

Chang, E. H., Milkman, K. L., Chugh, D., & Akinola, M. (2019). Diversity thresholds: How social norms, visibility, and scrutiny relate to group composition. *Academy of Management Journal, 62*(1), 144–171. https://doi.org/10.5465/amj.2017.0440.

Chatman, J. A., Boisnier, A. D., Spataro, S. E., Anderson, C., & Berdahl, J. L. (2008). Being distinctive versus being conspicuous: The effects of numeric status and sex-stereotyped tasks on individual performance in groups. *Organizational Behavior and Human Decision Processes, 107*(2), 141–160. https://doi.org/10.1016/j.obhdp.2008.02.006.

Cohen, L. L., & Swim, J. K. (1995). The differential impact of gender ratios on women and men: Tokenism, self-confidence, and expectations. *Personality and Social Psychology Bulletin, 21*(9), 876–884. https://doi.org/10.1177/0146167295219001.

Crocker, J., & McGraw, K. M. (1984). What's good for the goose is not good for the gander: Solo status as an obstacle to occupational achievement for males and females. *American Behavioral Scientist, 27*(3), 357–369. https://doi.org/10.1177/000276484027003007.

Dezső, C. L., Ross, D. G., & Uribe, J. (2016). Is there an implicit quota on women in top management? A large-sample statistical analysis. *Strategic Management Journal, 37*(1), 98–115. https://doi.org/10.1002/smj.2461.

Dipboye, R. L., & Colella, A. (2013). *Discrimination at work: The psychological and organizational bases.* Psychology Press.

Dovidio, J. F., Gaertner, S. L., & Saguy, T. (2008). Another view of "we": Majority and minority group perspectives on a common ingroup identity. *European Review of Social Psychology, 18*(1), 296–330. https://doi.org/10.1080/10463280701726132.

Duffy, M. K., Scott, K. L., Shaw, J. D., Tepper, B. J., & Aquino, K. (2012). A social context model of envy and social undermining. *Academy of Management Journal, 55*(3), 643–666. https://doi.org/10.5465/amj.2009.0804.

Duguid, M. (2011). Female tokens in high-prestige work groups: Catalysts or inhibitors of group diversification? *Organizational Behavior and Human Decision Processes, 116*(1), 104–115. https://doi.org/10.1016/j.obhdp.2011.05.009.

Ely, R. J. (1994). The effects of organizational demographics and social identity on relationships among professional women. *Administrative Science Quarterly, 39*(2), 203–238. https://doi.org/10.2307/2393234.

Floge, L., College, B., & Merrill, D. M. (1986). Tokenism reconsidered: Male nurses and female physicians in a hospital setting. *Social Forces, 64*, 925.

Flory, J. A., Leibbrandt, A., & List, J. A. (2015). Do competitive workplaces deter female workers? A large-scale natural field experiment on job entry decisions. *The Review of Economic Studies, 82*(1), 122–155. https://doi.org/10.1093/restud/rdu030.

Halevy, N., Cohen, T. R., Chou, E. Y., Katz, J. J., & Panter, A. T. (2014). Mental models at work: Cognitive causes and consequences of conflict in organizations. *Personality and Social Psychology Bulletin, 40*(1), 92–110. https://doi.org/10.1177/0146167213506468.

Hinds, P. J., Carley, K. M., Krackhardt, D., & Wholey, D. (2000). Choosing Work Group Members: Balancing Similarity, Competence, and Familiarity. *Organizational Behavior and Human Decision Processes, 81*(2), 226–251. https://doi.org/10.1006/obhd.1999.2875.

Hoffman, P. J., Festinger, L., & Lawrence, D. H. (1954). Tendencies toward group comparability in competitive bargaining. *Human Relations, 7*(2), 141–159. https://doi.org/10.1177/001872675400700203.

Kanter, R. M. (1977). Some effects of proportions on group life: Skewed sex ratios and responses to token women. *American Journal of Sociology, 82*(5), 965–990. https://doi.org/10.1086/226425.

Keller, J., & Sekaquaptewa, D. (2008). Solo status and women's spatial test performance: The role of individuation tendencies. *European Journal of Social Psychology, 38*(6), 1044–1053. https://doi.org/10.1002/ejsp.490.

Kilduff, G. J. (2014). Driven to win: Rivalry, motivation, and performance. *Social Psychological and Personality Science, 5*(8), 944–952. https://doi.org/10.1177/1948550614539770.

Kilduff, G. J., Elfenbein, H. A., & Staw, B. M. (2010). The psychology of rivalry: A relationally dependent analysis of competition. *Academy of Management Journal, 53*(5), 943–969. https://doi.org/10.5465/amj.2010.54533171.

Lee, S. Y., Kesebir, S., & Pillutla, M. M. (2016). Gender differences in response to competition with same-gender coworkers: A relational perspective. *Journal of Personality and Social Psychology, 110*(6), 869–886. https://doi.org/10.1037/pspi0000051.

Leslie, L. M., Manchester, C. F., & Dahm, P. C. (2017). Why and when does the gender gap reverse? Diversity goals and the pay premium for high potential women. *Academy of Management Journal, 60*(2), 402–432. https://doi.org/10.5465/amj.2015.0195.

Lievens, F., Decaesteker, C., Coetsier, P., & Geirnaert, J. (2001). Organizational attractiveness for prospective applicants: A person-organisation fit perspective. *Applied Psychology, 50*(1), 30–51. https://doi.org/10.1111/1464-0597.00047.

Ma, D. S., Correll, J., & Wittenbrink, B. (2015). The Chicago face database: A free stimulus set of faces and norming data. *Behavior Research Methods, 47*(4), 1122–1135. https://doi.org/10.3758/s13428-014-0532-5.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology, 58*(1), 593–614. https://doi.org/10.1146/annurev.psych.58.110405.085542.

Martins, L. L., & Parsons, C. K. (2007). Effects of gender diversity management on perceptions of organizational attractiveness: The role of individual differences in attitudes and beliefs. *Journal of Applied Psychology, 92*(3), 865. https://doi.org/10.1037/0021-9010.92.3.865.

Maslach, C. (1974). Social and personal bases of individuation. *Journal of Personality and Social Psychology, 29*(3), 411–425. https://doi.org/10.1037/h0036031.

Maslach, C., Stapp, J., & Santee, R. T. (1985). Individuation: Conceptual analysis and assessment. *Journal of Personality and Social Psychology, 49*(3), 729–738. https://doi.org/10.1037/0022-3514.49.3.729.

McGuire, W. J., McGuire, C. V., Child, P., & Fujioka, T. (1978). Salience of ethnicity in the spontaneous self-concept as a function of one's ethnic distinctiveness in the social environment. *Journal of Personality and Social Psychology, 36*(5), 511–520. https://doi.org/10.1037/0022-3514.36.5.511.

McGuire, W. J., & Padawer-Singer, A. (1976). Trait salience in the spontaneous self-concept. *Journal of Personality and Social Psychology, 33*(6), 743–754. https://doi.org/10.1037/0022-3514.33.6.743.

McKay, P. F., Avery, D. R., Tonidandel, S., Morris, M. A., Hernandez, M., & Hebl, M. R. (2007). Racial differences in employee retention: Are diversity climate perceptions the key? *Personnel Psychology, 60*(1), 35–62. https://doi.org/10.1111/j.1744-6570.2007.00064.x.

McPherson, M., & Smith-Lovin, L. (1987). Sex segregation in voluntary associations. *American Sociological Review, 51*(1), 61–79. https://doi.org/10.2307/2095478.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology, 27*(1), 415–444. https://doi.org/10.1146/annurev.soc.27.1.415.

Mehra, A., Kilduff, M., & Brass, D. J. (1998). At the margins: A distinctiveness approach to the social identity and social networks of underrepresented groups. *Academy of Management Journal, 41*(4), 441–452. https://doi.org/10.5465/257083.

Montoya, R. M., Horton, R. S., & Kirchner, J. (2008). Is actual similarity necessary for attraction? A meta-analysis of actual and perceived similarity. *Journal of Social and Personal Relationships, 25*(6), 889–922. https://doi.org/10.1177/0265407508096700.

Nelson, L. J., & Miller, D. T. (1995). The distinctiveness effect in social categorization: You are what makes you unusual. *Psychological Science, 6*(4), 246–249. https://doi.org/10.1111/j.1467-9280.1995.tb00600.x.

Niederle, M., & Vesterlund, L. (2007). Do women shy away from competition? Do men compete too much? *Quarterly Journal of Economics, 35*.

Niemann, Y. F., & Dovidio, J. F. (1998). Relationship of solo status, academic rank, and perceived distinctiveness to job satisfaction of racial/ethnic minorities. *The Journal of Applied Psychology, 83*(1), 55–71.

Plass, J. L., O'Keefe, P. A., Homer, B. D., Case, J., Hayward, E. O., Stein, M., & Perlin, K. (2013). The impact of individual, competitive, and collaborative mathematics game play on learning, performance, and motivation. *Journal of Educational Psychology, 105*(4), 1050–1066. https://doi.org/10.1037/a0032688.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*(4), 717–731. https://doi.org/10.3758/BF03206553.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879–891. https://doi.org/10.3758/BRM.40.3.879.

Ray, D., King-Casas, B., Montague, P. R., & Dayan, P. (2009). Bayesian model of behaviour in economic games. In D. Koller, D. Schuurmans, Y. Bengio, & L. Bottou (Eds.), Advances in Neural Information Processing Systems 21 (pp. 1345–1352). Retrieved from http://papers.nips.cc/paper/3589-bayesian-model-of-behaviour-in-economic-games.pdf.

Riordan, C. M., & Shore, L. M. (1997). Demographic diversity and employee attitudes: An empirical examination of relational demography within work units. *Journal of Applied Psychology, 82*(3), 342. https://doi.org/10.1037/0021-9010.82.3.342.

Roulin, N., Bangerter, A., & Yerly, E. (2011). The uniqueness effect in selection interviews. *Journal of Personnel Psychology, 10*(1), 43–47. https://doi.org/10.1027/1866-5888/a000024.

Scheiber, N. (2015). Work Policies May Be Kinder, but Brutal Competition Isn't. Retrieved June 26, 2019, from The New York Times website: https://www.nytimes.com/2015/08/18/business/work-policies-may-be-kinder-but-brutal-competition-isnt.html.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and non-experimental studies: New procedures and recommendations. *Psychological Methods,* 422–445.

Singleton, R. A., & Vacca, J. (2007). Interpersonal competition in friendships. *Sex Roles, 57*(9–10), 617–627. https://doi.org/10.1007/s11199-007-9298-x.

Snyder, C. R., & Lopez, S. J. (2001). *Handbook of positive psychology.* Oxford University Press.

Stangor, C., Lynch, L., Duan, C., & Glas, B. (1992). Categorization of individuals on the basis of multiple social features. *Journal of Personality and Social Psychology, 62*(2), 207. https://doi.org/10.1037/0022-3514.62.2.207.

Steinhage, A., Cable, D., & Wardley, D. (2017). The pros and cons of competition among employees. *Harvard Business Review,* 2–5.

Tajfel, H., & Turner, J. (1979). An integrative theory of intergroup conflict.

Thompson, M., & Sekaquaptewa, D. (2002). When being different is detrimental: Solo status and the performance of women and racial minorities. *Analyses of Social Issues and Public Policy, 2*(1), 183–203. https://doi.org/10.1111/j.1530-2415.2002.00037.x.

Turban, D. B., Dougherty, T. W., & Lee, F. K. (2002). Gender, race, and perceived similarity effects in developmental relationships: The moderating role of relationship duration. *Journal of Vocational Behavior, 61*(2), 240–262. https://doi.org/10.1006/jvbe.2001.1855.

Turban, D. B., & Greening, D. W. (1997). Corporate social performance and organizational attractiveness to prospective employees. *Academy of Management Journal, 40*(3), 658–672. https://doi.org/10.5465/257057.

Turban, D. B., & Keon, T. L. (1993). Organizational attractiveness: An interactionist perspective. *Journal of Applied Psychology, 78*(2), 184. https://doi.org/10.1037/0021-9010.78.2.184.

Umphress, E. E., Smith-Crowe, K., Brief, A. P., Dietz, J., & Watkins, M. B. (2007). When birds of a feather flock together and when they do not: Status composition, social dominance orientation, and organizational attractiveness. *Journal of Applied Psychology, 92*(2), 396–409. https://doi.org/10.1037/0021-9010.92.2.396.

Watkins, M. B., Simmons, A., & Umphress, E. (2019). It's not black and white: Toward a contingency perspective on the consequences of being a token. *Academy of Management Perspectives, 33*(3), 334–365. https://doi.org/10.5465/amp.2015.0154.

Yoder, J. D. (1991). Rethinking tokenism: Looking beyond numbers. *Gender and Society, 5*(2), 178–192.

Yoder, J. D., & Sinnett, L. M. (1985). Is it all in the numbers? A case study of tokenism. *Psychology of Women Quarterly, 9*(3), 413–418. https://doi.org/10.1111/j.1471-6402.1985.tb00890.x.