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Abstract

We investigated the effects of gender and group size on perceptions of group variability, using groups of students taking different majors that varied in the proportion of men and women (female-majority, parity, and male-majority). We found that both group size and gender had consistent effects on perceived out-group variability, even when potentially confounded alternative explanations were assessed. Men showed a stronger out-group homogeneity effect than women, except when women were in the majority (Studies One and Two), and women showed no in-group homogeneity effect. There was an association between out-group homogeneity and the tendency to generate more subgroups for the in-group than out-group (Study Two), but perceived variability was not associated with familiarity, distinctiveness, perceived group size, or perceived group status. These consistent effects qualify the conclusions of prior research in important ways, and cannot be explained in terms of differences in stereotype accuracy (Study Three), or a confound between the gender majority of a major and its perceived status (Study Four). We discuss our findings in terms of theoretical explanations for gender and size effects on out-group homogeneity, and methodological considerations.

Sociologists and social psychologists have long been intrigued by the effects of group proportions on social life. Notably, Kanter (1977a, b) drew attention to phenomena associated with being a small minority of women among a large majority of men. In this paper, we explore such effects in relation to variability within social groups, which constitute a core component of social stereotyping. We consider the full range of majority, minority, and parity numerical relations involving gender groups, studied as natural phenomena in the form of college majors.

The *out-group homogeneity effect*, defined as the tendency to perceive an out-group as being less variable, or more homogeneous, than an in-group (Jones, Wood, and Quattrone 1981) is sometimes referred to as if it were an “undisputed truism” (Ostrom and Sedikides 1992:550). Yet, although the effect is well-established, it is modest in size, and by no means ubiquitous (Devos, Comby, and Deschamps 1996; Ostrom and Sedikides 1992; Voci 2000). The effect could just as well have been named the *in-group heterogeneity effect* (Brewer 1993; Voci 2000), because it is still unclear whether it is driven mainly by perceptions of the out-group (Mullen and Hu 1989) or by the motivation to see the in-group as variable, and to differentiate one’s self from others.

The out-group homogeneity effect has widespread consequences for stereotyping and intergroup relations (Park, Judd, and Ryan 1991). Perceiving an out-group as relatively homogeneous can increase the impact of categorical versus individuating information (Krueger and Rothbart 1988), the likelihood that perceivers judge specific individuals in a stereotypic manner (Ryan, Judd, and Park 1996), and the recall advantage of stereotype-congruent information (Pendry and Macrae 1999). By affecting these and other processes, perceived homogeneity tends to enhance stereotype maintenance (Hewstone and Hamberger 2000) and may promote intergroup bias (Wilder 1978).

In view of these consequences of the out-group homogeneity effect, it is important to identify the extent to which it is moderated by other variables. In this article we investigate three such variables -- gender, group size and, indirectly, status -- which sometimes covary or, in natural settings, may be confounded and whose effects on perceived variability are still incompletely understood. We are especially interested in perceived variability in gender groups, precisely because gender groups are not typical of intergroup relations (e.g., there are relatively high levels of familiarity, and intergroup contact) and because gender group relations often occur in a context of variations in group size and status.

Gender and Perceived Variability

Lorenzi-Cioldi and colleagues (1993, 1998; Lorenzi-Cioldi, Eagly, and Stewart 1995; see also Young et al. 1999) have argued that out-group homogeneity appears to be a relatively strong effect among men, but weaker and even reversed among women (see also Linville, Fischer, and Salovey 1989), although it is not always found even among men (Linville et al. 1989 Stewart et al. 2000). It is also moderated by whether perceivers hold progressive versus traditional attitudes towards women’s rights and roles; Stewart et al. (2000) found that both women and men tend to better individuate women than men if they hold a progressive attitude towards women’s societal roles. Interestingly, this moderating effect of attitudes was not found in the Netherlands (where men were more likely to perceive outgroup homogeneity and women to individuate both gender groups equivalently; Stewart et al. 2004).

Lorenzi-Cioldi and colleagues (1995) proposed that this gender effect may be best understood in terms of status. Gender is typically confounded with status and power (e.g., Eagly 1987; Ridgeway and Diekema 1992; Stewart et al. 2006), and members of low-status groups may be perceived as more homogeneous than members of high-status groups, regardless of which group the perceivers belong to, and independent of power (Boldry and

Gaertner 2006). A number of other researchers have also acknowledged that social status can moderate out-group homogeneity effects (e.g., Brewer 1993; Linville, Salovey, and Fischer 1986; Park, Ryan, and Judd 1992; see Brauer 2001).

Lorenzi-Cioldi (1993, 1998) and Stewart and colleagues (Stewart and Vassar 2000; Stewart et al. 2000) argued that there are stable differences in the mental representation of groups that differ in status and dominance, with high-status groups being perceived as collections of distinct individuals. In contrast, subordinate, low-status groups are perceived as aggregates of interchangeable individuals. Consequently, high-status groups are, in general, perceived as more variable than low-status groups. According to this view, if the in-group has high status, an out-group homogeneity effect is found, but if the in-group has low status, then an in-group homogeneity effect may be found. Relatedly, researchers have analyzed the effects of power on perceived group variability (Guinote 2004). Positions of power are often occupied by majority, rather than minority, members, giving them direct control of important outcomes for minorities. People are more attentive to those who have power in an effort to predict and control their outcomes (Fiske 1993), and thus it would make sense for less powerful minority members to perceive greater variability in a more powerful majority out-group than in their in-group. This is exactly what Guinote, Judd, and Brauer (2002) found; they showed that powerful groups were more variable than powerless groups, a fact detected by uninvolved observers (see Keltner, Gruenfeld, and Anderson 2003 for a similar argument relating to status).

Lorenzi-Cioldi (1998) argued that gender is a more salient category for women than men, because of their lower status; women perceive themselves as more of a group, whereas men perceive themselves as a collection of individuals. Cross and Madson (1997) made a similar distinction between men and women in terms of self-construals (see Markus and Kitayama 1991). They argued that, at least for people in the United States, men and women construct and maintain independent and interdependent self-construals, respectively. Independent self-construal focuses on separating the self from others and demonstrating one's uniqueness, whereas interdependent self-construal seeks to connect the self to others. These different self-construals would, like the status account, lead us to predict an out-group homogeneity effect for men, but an in-group homogeneity effect for women. Other research, however, has suggested that women habitually rely less on categories than do men, because they are more oriented towards interpersonal relations (e.g., Horwitz and Rabbie 1982). If this orientation leads women to individuate both men and women, whereas men's higher status leads them to individuate other men but categorize women (Young et al. 1999), then we would predict out-group homogeneity for men, but no difference in the perceived variability of the in- and out-group for women (who might be expected to view both groups as more variable than men do).

A final contributor to relative out-group homogeneity for men is that members of high-status groups may also actively resist depersonalization (being treated as equivalent to other members of their gender group), and engage in a 'personalizing strategy', in order to claim personal credit for and legitimize their higher social status (Lorenzi-Cioldi 1998). For the same reason, men may find it harder, or be more reluctant, to identify with their gender category than women do (Branscombe 1998; Fajak and Haslam 1998). The major weakness of the status account, however, is that Lorenzi-Cioldi (1998) has consistently reported null effects in his own research using a direct measure of status (a result he attributes to social desirability concerns). Stewart and colleagues (2000, 2004, 2006; Stewart and Vassar 2000), have been more successful in demonstrating a perceived status difference between men and women using a different measure of status. However, their name-matching measure of

perceived group variability (based on Taylor et al. 1978) has consistently failed to identify significant gender-based out-group homogeneity or in-group homogeneity effects.

Group Size and Perceived Variability

Group size is a salient attribute of many natural intergroup contexts, often covarying with differences in status and power. Kanter (1977a, b) provided a pioneering sociological analysis of the consequences of group proportions such as skewed sex ratios. She was especially concerned with the plight of very small minorities of women (which she termed *tokens*) faced with a large majority (*dominants*) in male-dominated organizations. Indeed, subsequent research has found that women who are the minority in a male domain tend to experience the greatest prejudice and discrimination (Nieva and Gutek 1981; see also Eagly, Makhijani, and Klonsky 1992; Eagly and Mladinic 1994). Moreover, if their self-esteem is invested in performance in a male-dominated domain they may be simultaneously both more adversely affected by poor performance and less able to derive a positive self-esteem boost from good performance in this domain (Crocker et al. 2003).

Kanter proposed that token women's proportional rarity was associated with three "perceptual phenomena": visibility, polarization, and assimilation. *Visibility* refers to the fact that tokens are highly visible, receive more attention than dominants, and feel different (cf. Milliken and Martins 1996; Taylor et al. 1978). This notion is consistent with social-psychological data showing that the perceptual distinctiveness, or visibility, of a given characteristic renders it more salient (e.g., McGuire and McGuire 1981; McGuire, McGuire, and Winton 1977), and that members of numerical minority groups are more cognitively preoccupied with their group membership than are members of majority groups (Lücken and Simon 2005). *Polarization* refers to the contrast drawn between tokens and dominants; the presence of the tokens can lead to dominants' exaggerating both the tokens' within-group commonalities and differences between the two groups (cf. Tajfel and Wilkes 1963). *Assimilation* refers to the fact that tokens' personal characteristics tend to be distorted to fit the generalization, or stereotype (cf. Taylor et al. 1978). Although empirical support for Kanter's propositions is only mixed (Allmendinger and Hackman 1995; Niemann and Dovidio 1998), and negative effects of gender proportions tend not to affect men (e.g., Sackett, DuBois, and Noe 1991), Social-psychological research on perceived variability has not yet been linked to Kanter's work on group proportions.

The link is, however, implicit from the way Kanter described visibility, polarization, and, especially, assimilation (Hewstone et al. 2006). Kanter uses dominants' mistaking one token for another as an example of assimilation; this is the kind of within-group confusion reported by Taylor et al. (1978). Indeed, several researchers (e.g., Lorenzi-Cioldi 1998; Lorenzi-Cioldi et al. 1995; Stewart et al. 2000) have used Taylor et al.'s memory-confusion measure as a measure of perceived variability. Kanter also stated that when proportions become less extreme (i.e., from skewed to tilted) the 'minority', as opposed to 'tokens', "begin to become individuals differentiated from each other" (1977b:966). From Kanter's work, we expect an out-group homogeneity effect for majorities, because their members are more likely to polarize small minority members and assimilate them to the stereotype. We also expect an in-group homogeneity effect for members of small minorities, since feelings of distinctiveness, discomfort, and dissatisfaction could promote a sense of threat to which they respond by seeing their own group as united and cohesive. There is evidence consistent with these predictions from several studies on group size and perceived variability. Simon (1992, 1998; Simon and Brown 1987) concluded that members of non-minority groups show a relative out-group homogeneity effect, but members of minority groups show a relative in-group homogeneity effect (e.g., Simon and Brown 1987; Simon and Pettigrew 1990; see also Mullen and Hu 1989, for meta-analytic support).

There are three main explanations for group size effects on perceived variability. First, on statistical grounds, there is greater variability in large samples than in small samples, even when the two samples are drawn from the same population (e.g., Bartsch and Judd 1993). Minorities then should be perceived as more homogeneous than majorities (Linville, Fischer, and Salovey 1989). Yet Simon and Mummendey (1990) found only a weak or nonsignificant correlation between perceived group size and out-group homogeneity, and Simon and Brown (1987) reported that participants in control conditions (who were not assigned to groups) did not perceive the minority group as more homogeneous than the majority group.

Second, there have been motivational accounts of group-size effects, in terms of social identity (Tajfel and Turner 1986) and optimal distinctiveness (Brewer 1993). Simon (e.g., Simon and Brown 1987; Simon and Pettigrew 1990) argued that being in a minority, which anyway tends to make group membership more salient (Brewer 1993; Mullen, Brown, and Smith 1992), may pose a threat to group members' self-esteem. Minority members may respond by perceiving their in-group as more homogeneous; they stereotype themselves more in terms of their minority group membership, promoting in-group solidarity and accentuating social identity (Tajfel and Turner 1986; see Ellemers and van Rijswijk 1997).

However, self-categorization theory also proposes that in-group membership is more salient for women and minorities, who tend to define more situations as *intergroup* (i.e., in terms of category memberships) than do members of majorities (Haslam et al. 1992; see also Brewer 1993; Haslam et al. 1996). When perceivers view situations in intergroup terms, the in-group and the out-group should be perceived as equally homogeneous (due to accentuation of within-group similarities and between-group differences; Tajfel and Wilkes 1963), but when the groups are numerical majorities and minorities and the comparative context is clear, an in-group homogeneity effect for the minority group should be predicted. Brewer's (1993) optimal distinctiveness theory proposes that perceived group variability is moderated by two needs, assimilation to the group and differentiation from others. From this perspective, we can predict out-group homogeneity effects in large, highly inclusive in-groups where there is a need to differentiate oneself (e.g., numerical majorities), and either no effect, or even an in-group homogeneity effect, in small, distinctive or exclusive in-groups where members strongly identify with the in-group (e.g., numerical minorities).

Third, Simon (1992) explained the effects of in-group size on perceived variability of status. Group size tends to be correlated with status (Farley 1982); members of majority groups who have relatively high in-group status show an out-group homogeneity effect, whereas the low status of minority groups increases category salience and leads to an in-group homogeneity effect (Simon and Hamilton 1994). Consistent with this view, making women aware of their stigmatized status and/or gender group has increased their perceived similarity to women as a group (Foster and Matheson 1998; Hogg and Turner 1987). This in-group homogeneity effect is especially likely when group boundaries are impermeable, which tends to lead members to identify more strongly with their in-group (Ellemers et al. 1988).

Gender, Group Size, and Status

Gender, group size, and status (status apparently relating to both gender and size) can have an impact on perceptions of group variability, and outside the laboratory, of course, these characteristics often covary. For (high status) men, Lorenzi-Cioldi (1998) predicts an out-group homogeneity effect, which should be exaggerated when they are the numerical majority (Brewer 1993; Simon 1992). There is much less consensus in predicting the impact of group size and status on women, despite the general agreement that category membership is more salient for women and numerical minorities (e.g., Lorenzi-Cioldi 1998; Oakes, Haslam, and Turner 1994; Simon 1992). If Horwitz and Rabbie (1982) are correct, women rely less on categories and may tend to perceive both target groups as more variable than men do.

According to Lorenzi-Cioldi (1998) and Simon (1992), minority women might be expected to show an especially strong in-group homogeneity effect. Yet according to Oakes et al. (1994), women in a minority might be more likely to see the situation in intergroup terms, and thus see the in- and out-group as equally homogeneous. A fourth prediction draws on a study by Swan and Wyer (1997), even though it did not measure perceived variability. They found that making women conscious of their gender, via numerical distinctiveness, made women more aware of their low social status; however, it led them to differentiate themselves from other members of this low-status category, which suggests in-group heterogeneity rather than homogeneity (Doosje, Spears, and Koomen 1995; Rubin, Hewstone, and Voci 2001). Taking into account that the in-group homogeneity effect is weaker than the out-group homogeneity effect (Voci 2000), we predict that men in the majority will show the strongest out-group homogeneity effect. Given the theoretical dissensus and empirical inconsistency, it is much harder to make predictions for women in the minority.

There is some prior evidence that group size and status variables can have interactive effects when natural groups are used (Brown and Smith 1989; Hewstone, Islam and Judd 1993; Voci and Capozza 1998), with the strongest out-group homogeneity effect for participants from larger groups with high status. Hewstone et al. (1993) found an out-group homogeneity effect among religious groups in Bangladesh only when the religious in-group was the numerical and higher-status majority group in its country. Similarly, Voci and Capozza (1998) compared two Italian regional groups of comparable size and found some evidence for an out-group homogeneity effect for the high-status Northerners, but no effect for the low-status Southerners.

Most relevant for us, however, is a frequently cited study by Brown and Smith (1989), because it involves gender, group size, and status. They studied male and female academics' perceptions of their gender in-group and out-group in their university, where women were in a very small numerical minority and had low status compared with men. They reported that both participant groups rated the female minority as more homogeneous than the male majority (i.e., the women rated their in-group as more homogeneous than the out-group, whereas the men rated their in-group as more heterogeneous than the out-group). Unfortunately, it is impossible to attribute the results of this field study to a gender effect for female academics, their minority group size, or their lower status in this setting, because the natural setting confounded gender and group size (the authors were only able to study a female minority and a male majority).

In the present set of studies, we extend prior research by exploring what effects gender, group size, and status have on perceived variability and how they might do so. Our research also stays true to the important goal of studying these issues in natural groups and real settings, by capitalizing on existing variation in the size of gender groups found in academic majors. Studies One and Two investigated whether gender and group size moderate perceived group variability and whether perceived variability is mediated by familiarity, distinctiveness, perceived group size, status, and differentiation of in- and out-groups into subgroups. Study Three investigated whether differences in perceived variability could reflect differences in stereotype accuracy as a function of gender and group size, and Study Four addressed a possible confound between status and the gender composition of majors in these field settings.

Study One

The main purpose of our first study was to investigate the impact of gender and group size on perceived variability. To study the effects of gender proportions, we used students from university departments (college majors) with varying proportions of male and female

students.¹ We included three types of departments: those in which women were in the majority, those in which men were in the majority, and those with almost equal proportions of women and men.

As well as measuring perceived variability, we included several measures based on Kanter's (1977a, b) work, to test whether members of the minority, especially women, would feel more distinctive and less comfortable or satisfied than members of the majority. These items were intended to tap *visibility*, the extent to which tokens are highly visible, receive more attention than dominants, and feel different. To the extent that members of a minority feel aversive distinctiveness, discomfort, and dissatisfaction, this might promote a sense of threat to which they respond by seeing their own group as united and cohesive, yielding an in-group homogeneity effect for members of small minorities.

Finally, we investigated several potential mediators of perceived variability, with a special focus on familiarity in the first study. Although Linville and colleagues have argued that greater familiarity with the in-group (compared with the out-group) will lead to out-group homogeneity (Linville and Fischer 1993; Linville et al. 1986, 1989), there is little evidence that familiarity mediates the out-group homogeneity effect (Park et al. 1992; Stewart et al. 2006; but see also Linville and Fischer 1993). Nonetheless, it seems highly plausible that familiarity could mediate the effects of either or both of the two moderators of perceived variability on which we focus, gender and group size.

Regarding gender, Linville et al. (1989, Experiment 3) originally predicted that gender groups would not yield an out-group homogeneity effect, because the two groups were equally familiar, a result which they indeed reported. However, several other studies have found gender-based out-group homogeneity effects (Rubin et al. 2004). Regarding group size, members of a minority are more likely to be familiar with members of a majority than the reverse because they have a higher probability of meeting them. Familiarity could therefore, potentially, explain the effect of group size on perceived variability (i.e., a stronger out-group homogeneity effect for majorities than minorities).

Finally, we emphasize three methodological points based on the need to replicate details of the study that our research extends (Brown and Smith 1989). First, we assessed perceived variability using the range measure (Jones et al. 1981), which assesses the perceived dispersion component of variability (and not stereotypicality, Park and Judd 1990). The range measure is simple to administer and has been identified as one of the most valid and robust measures of perceived variability (Park and Judd 1990; Ostrom and Sedikides 1992). It is also

¹. The use of the term group, as opposed to category, has produced some confusion in the area of intergroup relations (e.g., Horwitz and Rabbie 1982; Tajfel 1982). Following the social identity tradition (e.g., Turner and Reynolds 2001:137), we use the term *group* to denote situations in which people subjectively identify with their social categories, as opposed to simply sharing one or more attributes, but not subjectively acknowledging this commonality. Given the nature of British universities, we have no hesitation in describing single-honors students of the same major as members of a common group. They go through a three-year university course as a cohort, they spend a great deal of time with one another, many if not most friends are doing the same subject, and numerous studies have shown that students do identify with their 'major' group (Crisp 2006).

particularly sensitive to the moderating effects of group status (Boldry, Gaertner, and Quinn 2007), generally revealing an out-group homogeneity effect for members of high-status groups, but no significant effect for members of low-status groups. Finally, the range measure perhaps best corresponds to what we traditionally think of as *perceived group variability* (Ryan 1996) -- the extent to which group members are perceived to be dispersed about the group central tendency.

Second, because Brown and Smith (1989) asked their academic participants to mark the range of both gender target groups on three items that were relevant to their professional group rather than to gender stereotypes, we did the same with our student participants.²

Third, because gender groups are natural groups, their use in such research requires that certain methodological precautions be taken. These include the use of participants from both groups, and the inclusion of similar numbers of participants from each group (Ostrom and Sedikides 1992).

Thus, our first study investigated the impact of gender and group size on perceived group variability, and whether familiarity mediated the effects of gender and/or group size on perceived variability; we also explored some new measures of visibility, as conceived by Kanter (1977a, b). In particular, we tested whether the out-group homogeneity effect was strongest for male majorities and whether women in a minority showed an out-group homogeneity effect, an in-group homogeneity effect, or no significant difference in perceived group variability.

Method

Participants and design. The participants were 211 first-year undergraduates at a British university. The design of the study was a 2 x 3 x 2 – participant gender (female/male) x group size (female-majority/parity/male-majority) x target (in-group/out-group) – mixed quasi-experimental design, with repeated measures on the last factor. The departments selected, the proportion of the dominant group, and the absolute numbers of female and male students were as follows: *female-majority* (education 77%: 86 females, 26 males; psychology 85%: 131 females, 24 males); *parity* (biochemistry 56%: 44 females, 34 males; mathematics 54%: 64 females, 74 males); *male-majority* (earth sciences 74%: 25 females, 71 males, engineering 84%: 45 females, 243 males). The number of female and male participants from each type of department was as follows: female-majority (43 females, 32 males); parity (34 females, 35 males); male-majority (39 females, 38 males).³

² Although Ostrom and Sedikides (1992) argue against stereotype-irrelevant dimensions, Quattrone (1986) pointed out that stereotype-relevant dimensions yield more polarized ratings, with little room on the scale in one direction from the rating of the group average; in this case, ranges would be insensitive indices of perceived variability. The traits we used in Studies One and Two are relevant to the superordinate category of students, but not to gender groups (following Brown & Smith 1989).

³ Kanter (1977a, b) distinguished four group types based on the proportions of majority and minority groups, varying from uniform (e.g., all group members are men), through skewed (e.g., a huge majority of men are the dominants, and a tiny minority of women are tokens), to tilted (e.g., a large majority of men and a minority of women), and balanced (even representation of both groups). Her criteria for skewed and tilted groups are, in fact, rather vague; those of Allmendinger and Hackman (1995) are much clearer (skewed: 1-11% minority members; tilted: 24-47% minority members). By these criteria, all of the majority departments used in our research are gender-tilted. Relatedly, Gross and Miller (1997) have argued that the “Golden Section” (61.8% majority; 38.2% minority) may reflect

Procedure. To provide a strong test of the hypothesis that perceived group variability varies relative to group size, we obtained data on numbers of female and male undergraduates in all university departments from the university's central administration. We then selected departments according to two criteria: (1) they should represent either a large female- or male-majority, or parity; and (2) for the two majority conditions, the absolute size of the minority group should be large enough to provide a reliable sample.

Ten female student-interviewers approached respondents individually in the coffee rooms or study areas of their departments and asked them to complete a short survey on "perceptions of student groups".⁴ The questionnaire made explicit that ratings of both gender groups in the respondent's department were required, on separate pages. Owing to a procedural error, we did not counterbalance rating order of in- and out-groups in this study.⁵ The survey took approximately ten minutes to complete. The following dependent measures appeared in order on the questionnaire.

Perceived dispersion. The dimensions selected for rating female and male students in each group-size condition were general dimensions relevant to being a successful student: intelligent, creative, and motivated. Pretesting ensured that the dimensions used were neutral (neither stereotypical nor counter-stereotypical) with regard to gender and academic major (using a one-sample *t*-test, means were not significantly different from the midpoint of the scale when participants rated how characteristic the three dimensions were for males, females, and majors). Respondents marked an 'X' on each of three 100mm scales (anchored *not at all* and *extremely*) where on average they thought target group students in their department fell, and then marked where the most extreme target group members fell by making two vertical slashes on each line. The difference between the rated extremes (full range) was the measure of perceived variability for the target group. The three scales were anchored with the endpoints *not at all* and *very*.⁶

the point at which, subjectively, majority size is recognized. The range of majority sizes in our studies (66%-88%) clearly satisfies this criterion.

⁴Throughout our research, when multiple interviewers were used, each interviewer was assigned to collect data from every department used, so that interviewer was not confounded with department. We also excluded data from five participants (in both Studies One and Two), because they had completed the questionnaire incorrectly or their first language was not English.

⁵Although unintentional, this oversight is unlikely to have affected the data. Several authors argue that when participants know that they will judge both in-group and out-group, and it is clear that the study is about intergroup relations, the order of target groups has no effect (Brewer 1993; Haslam et al. 1995; Oakes et al. 1994). We show this to be the case in Study Two.

⁶The mean ratings on these scales can be used as measures of group evaluation. In all studies we found a tendency for women to be liked more than men; this effect is quite common (see Eagly and Mladinic 1994; Lorenzi-Cioldi 1998), and we will not discuss it further, since our focus is on perceived group variability. Because all three dimensions were positive, we also analyzed the variability data using analysis of covariance (using the mean as covariate) to ensure that our effects were not driven by the tendency to use one end of the scale (Brown and Smith 1989). However, results were unchanged. For all studies reported, there were no significant differences between individual departments (i.e., majors) nested within the same level of the in-group size factor (e.g., between engineering and physics, both of which are male-majority majors). One reviewer suggested that, even if not reflected in actual enrollment numbers, some specific majors might have had an impact on perceived

Familiarity. Respondents rated how familiar they were with other women and men students in their department, on seven-point scales (1 = *not at all*; 7 = *very*).

Visibility. Respondents rated how comfortable, distinctive, and satisfied they felt as a student in their department on seven-point scales (1 = *not at all*; 7 = *very*).

Background questions. Respondents were then asked to write the name of their department, whether they were single or joint honors students, what proportions (as percentages summing to 100) of first year students in their department were female and male, their own gender, and their year of study. These questions were mainly aimed at ensuring the purity of our samples, which should not contain students visiting from another department, joint honors students, or confound differences between departments with year of study.

Results and Discussion

Unless reported otherwise, we analyzed the data using a 2 x 3 x 2 – participant gender x group size (female majority/parity/male majority) x target group (in-group/out-group) – mixed-model analysis of variance (ANOVA), with repeated measures on the last factor. We were primarily interested in *gender x target group* and *gender x target group x group size* interactions. To improve readability of this article, we have focused our reporting of simple main effects on the in-group vs. out-group comparisons in each condition for all measures that included a target group repeated measure. The means for the main dependent measures are shown in Table 1.

Insert Table 1 Here

Perceived group size. To test whether perceivers were aware of the proportions of the two gender groups in their department, we computed a 2 (gender) x 3 (group size) ANOVA on the perceived percentage of male students minus the perceived percentage of female students. Positive scores indicate a perceived male majority and negative scores a perceived female majority. This analysis yielded a main effect of group size, $F(2, 205) = 599.37, p < .0001$, revealing positive scores for male-majority departments ($M = 59.45, SD = 25.57$), scores close to zero for parity departments ($M = -0.64, SD = 15.04$), and negative scores for female-majority departments ($M = -57.38, SD = 17.96$); the mean in each group-size condition was reliably different from the means in the other two departments (Newman-Keuls, $p < .05$). There was also a significant *gender x group size* interaction, $F(2, 205) = 3.12, p < .05$; simple main effects tests revealed that in male-majority departments men perceived a larger proportion of men ($M = 65.47, SD = 25.07$) than did women ($M = 53.59, SD = 24.97$), $F(1, 205) = 6.74, p = .001$. Hence, this interaction did not qualify the overall conclusion that our participants were aware that men outnumbered women in male-majority departments, and *vice versa* in female-majority departments.

Perceived dispersion. We computed indices of in-group and out-group variability from the three separate ratings of in-group and out-group variability on the range measure (Cronbach's alphas = .66 and .763, respectively). The ANOVA yielded a significant *gender x target group* interaction, $F(1, 205) = 13.14, p < .001$, which was qualified by a significant

variability, because they were felt to be a male or female domain. For example, mathematics is an example of a field in which women may face stereotype threat (i.e., perception that one is at risk of confirming a negative stereotype of one's group as being characteristic of oneself; Steele and Aronson 1995). This is especially likely when the domain is important for self-definition (see Spencer, Steele, and Quinn 1999). The absence of any significant differences between majors within type of department, however, argues against any such major-specific effect, and the results for distinctiveness in Study One argue against the possible stereotype-threat account, because females did not report feeling more distinctive than males in male-majority departments.

gender x target group x group size interaction, $F(2, 205) = 3.84, p < .025$ (Table 1). We used simple main effects analyses to test differences in the perception of in-group and out-group variability. In female-majority departments, neither women nor men gave different ratings for the two target groups and the *gender x target* interaction was non-significant, $F(1, 63) = .03, p = .871$. In parity departments, the *gender x target* interaction was significant, $F(1, 67) = 12.03, p = .001$. There was a reliable out-group homogeneity effect for men, $F(1, 67) = 12.85, p < .001$; however, women viewed women as more homogeneous than men, but the difference was not statistically significant. In male-majority departments, the *gender x target* interaction was also significant, $F(1, 75) = 8.50, p = .005$. There was again a reliable out-group homogeneity effect for men, $F(1, 75) = 9.78, p < .004$, but no difference in perceived variability for women.

These results are consistent with the claim that the out-group homogeneity effect is stronger for men than women (Lorenzi-Cioldi 1993; Lorenzi-Cioldi et al. 1995). As Brauer and Judd (2000) have pointed out, one has to be careful that such results do not simply reflect a main effect of target group when this factor is defined as men versus women, rather than in-group versus out-group (i.e., both female and male participants perceive men to be more variable than women). However, this interpretation is not supported by the pattern of means in Table 1, which reflect an out-group homogeneity effect for men, but not an in-group homogeneity effect for women. What the results do show is that the tendency of men to show an out-group homogeneity effect is moderated by group size, occurring when men are in the majority or numerically equal to women, but not when women are in the majority. Contrary to our prediction, however, men's out-group homogeneity effect was not more pronounced when they were in the majority than when groups were equal in size. What seems to matter is only that men do not find themselves in the minority; if men are in the minority (the condition that Brown and Smith 1989 could not study), they no longer show an out-group homogeneity effect.

The results for women do not yield strong support for any of the theoretical predictions considered. Even when they are in the minority, there is no evidence that women see the in-group as either more homogeneous (cf. Brown and Simon 1989; Simon 1992) or as more heterogeneous (cf. Swan and Wyer 1997). Overall, and in every setting, women see the in-group and out-group as equally variable. Although this result seems consistent with Oakes et al.'s (1994) prediction that women are more likely to see the situation in intergroup terms, women showed no general tendency to homogenize target groups more than men ($M_{\text{women}} = 52.83, SD = 12.74$ vs $M_{\text{men}} = 53.91, SD = 15.22$). Nor do these data give strong support to the idea that women rely less on categories than men (cf. Horwitz and Rabbie 1982), since women do not perceive target groups in general as more heterogeneous than men do.

Familiarity. The ANOVA revealed significant main effects of group size, $F(2, 205) = 8.31, p < .001$, and target group, $F(1, 205) = 42.34, p < .001$, which were qualified by a significant *gender x group size x target group* interaction, $F(2, 205) = 13.35, p < .001$. In female-majority departments the *gender x target* interaction was significant, $F(1, 63) = 10.51, p = .002$. Simple main effects analyses revealed that only women rated themselves as being more familiar with the in-group than the out-group, $F(1, 63) = 19.26, p < .001$. The *gender x target* interaction was insignificant in parity departments, $F(1, 67) = .17, p = .683$. In male-majority departments, the *gender x target* interaction was significant, $F(1, 75) = 13.69, p < .0005$. Only men rated themselves as being more familiar with the in-group than the out-group, $F(1, 75) = 34.72, p < .001$. Thus, rated familiarity of in-group and out-group was moderated by group size; both women and men only rated the in-group as being more familiar than the out-group when the gender in-group was in the majority. This makes good sense,

because one would expect an attenuation of the in-group familiarity effect when the out-group was proportionally much larger than the in-group.

Feelings of comfort, distinctiveness, and satisfaction. These three ratings did not form a reliable scale, and so we computed three separate two-factor ANOVAs that crossed participant gender with group size. There were no reliable effects on ratings of how comfortable or satisfied students felt in their department. There was, however, a reliable interaction for the measure of distinctiveness, $F(2, 205) = 3.80, p < .025$. Simple main effects tests revealed that only in the female-majority departments did the minority group (men) rate themselves as being more distinctive than the majority group, $F(1, 205) = 8.96, p < .005$. Women did, however, report feeling less distinctive when they were in the majority than they did in either parity or male-majority departments (Newman-Keuls, $p < .05$). Both these findings give some support to theoretical positions that argue that members of minorities feel more distinctive than members of majorities (Kanter 1977a, b; Simon 1992).

Analysis of covariance. We computed an Analysis of Covariance (ANCOVA), with the aim of analyzing the antecedents of variability perceptions (Yzerbyt, Muller, and Judd 2004). The design was $2 \times 3 \times 2$ – participant gender $\times$ group size (female majority/parity/male majority) $\times$ target group (in-group/out-group) – with repeated measures on the last factor. The dependent variable was perceived variability, while distinctiveness, group familiarity, and perceived group size were treated as covariates. The results showed that the covariates did not alter the effects of the independent variables on the dependent variable previously obtained with the ANOVA. The *gender $\times$ target* interaction remained significant, $F(1, 203) = 13.34, p < .001$, as did the three-way interaction, $F(2, 203) = 3.08, p < .05$. Moreover, none of the covariates had a reliable effect on the dependent variable ($F_s < 1$). Thus, none of the considered variables was an antecedent of variability perceptions.

To summarize, this first study found an out-group homogeneity effect for men as long as they were not outnumbered by women. Thus, the stronger out-group homogeneity effect for men reported by Lorenzi-Cioldi (1993) was moderated by group size. Women showed no instance of perceived out-group homogeneity. Nor did they show any reliable tendency, even when in the minority, to view the in-group as either more homogeneous (cf. Brown and Smith 1989; Simon 1992) or more heterogeneous (cf. Swan and Wyer 1997). In all three group-size conditions, women rated in-group and out-group equally variable, but they showed no tendency to perceive target groups as either more homogeneous (Oakes et al. 1994) or more heterogeneous (Horwitz and Rabbie 1982) than did men. Both gender groups rated the in-group as being more familiar than the out-group only when the in-group was in a majority. However, there was no evidence that differences in in-group/out-group familiarity were antecedents of perceived group variability (see also Stewart et al. 2006). There was also no evidence that women felt more distinctive than men, either generally or as a minority, giving no indication that women's gender group membership was especially salient.

Study Two

Thus far, we have reported consistent effects of both gender and group size on perceived variability, yet have been unable to identify what mediates these effects. In Study Two, we considered perceived status and subgrouping as potential mediators of perceived variability. As we noted above, researchers have argued that both gender (Lorenzi-Cioldi 1998) and group size (Simon 1992) effects reflect underlying differences in status. Unlike group size, we had no objective data that our natural groups actually varied in status. We therefore added a measure of the perceived status of gender in-group and out-group (thus also of majority and minority) in the major, and included this as a potential mediator in a model of the impact of gender and group size on perceived variability.

Fiske's work (e.g., Fiske and Berdahl 2007; Fiske, Morling, and Stevens 1996) has emphasized the importance of differentiating status from power, which are often correlated. She defined status as societal position, but power as control over resources. Given the complexity of our multilayered situation, we can readily imagine that our respondents might interpret status in a variety of ways (e.g., income earned, ability to influence others, role model in society, etc). Given this diversity, we opted for a single-item direct measure of status, generally conceived. While this is a deliberate simplification at this stage of the research program, we return to this issue later in the discussion.

We also measured the extent to which participants thought about their gender in- and out-groups in terms of subgroups. A number of studies have found that knowledge about the in-group is stored in a richer, more differentiated structure of subgroups than is the case for out-groups (e.g., Maurer, Park and Rothbart 1995; Park et al. 1992; Richards and Hewstone 2001). If these subgroups are retrieved when judging group variability, and perceivers have been shown to be more likely to talk about subgroups when judging the in-group (Park and Judd 1990, Study Two), then this would emphasize the relative heterogeneity of the in-group (Park et al. 1991). Park and colleagues (1992, Study One) found that group members generated more subgroups for the in-group than the out-group, and that perceivers who were asked to sort individual members of a (fictional) group into as many subgroups as they wished later judged the group to be more variable compared with participants who were asked to think about what the group was like as a whole (see also Hewstone and Hamberger 2000; Maurer et al. 1995). Of several potential mediators considered, Park and colleagues found that only controlling statistically for the number of subgroups reduced the out-group homogeneity effect, suggesting that subgrouping mediated perceived variability. However, later studies by both Maurer et al. and Hewstone and Hamberger reported a bidirectional association.⁷ Of direct relevance to the present research, Stewart et al. (2006) demonstrated the mediating role of gender subgroups (and not of familiarity) in driving the effect of male and female attitudes on the relative individuation of women and men.

These studies suggest that perceivers' relatively greater differentiation of the in-group into specific subgroups plays a key role in perceptions of group variability, and thus perhaps it could also help to explain gender and group size effects. Regarding gender, the findings of two quite different literatures lead us to expect that women and men might vary in the extent to which they generate subgroups in the in-group compared with the out-group -- status and self-construal. Findings in both domains lead to the prediction that men should show a stronger tendency than women to generate relatively more in-group than out-group subgroups. If women have lower status than men then they may (feel the) need to make differentiations among higher status, powerful men who control their outcomes (e.g., Fiske et al. 1996; Lorenzi-Cioldi 1998). Conversely, men could be less motivated to differentiate between women and view them as interchangeable. In addition, if women tend to construct interdependent self-construals but men tend to construct independent self-construals (Cross and Madson 1997), and they both focus on intragender group comparisons, we would expect women to show a weaker tendency than men to differentiate the in-group into subgroups. Men could help themselves to construct an independent self-construal precisely by perceiving subgroups within their own group, and perhaps by seeing themselves as part of a particularly valued subgroup (Cross and Madson 1997). Finally, by declining to distinguish subgroups

⁷ At the time when Park et al. (1992) published their data and concluded that subgrouping mediated perceived variability, researchers did not routinely test for reverse mediation. It is possible, therefore, that in this study too the effect was bidirectional.

within their own gender category, women could help to maintain coherence and solidarity within their gender category, which Simon (1992) sees as the basis for an in-group homogeneity effect.

Beyond their strategic role in differentiating the in-group, or the out-group, subgroups could also help to explain group size effects on perceived variability. Dunbar (1993) has argued from an evolutionary perspective that, beyond a certain group size, it is not possible to secure first-hand knowledge of all the members of a group, so we may treat them in terms of types or categories (Baron 1997). If we assume that acquiring first-hand knowledge of all group members is also more difficult in the case of a majority than a minority (even though, as we pointed out earlier, there is a higher probability of meeting exemplars of the majority), then more subgroups should be perceived within majorities than minorities both for in-group and out-group members. Taken together, these two effects lead us to predict that the relatively superior differentiation of the in-group than the out-group into subgroups would be greatest for high-status men in the majority and lowest for low-status women in the minority. On these bases, we hypothesized that the relative differentiation of the in-group and out-group into subgroups might plausibly mediate the effects of both gender and group size on perceived variability.

In summary, the main aim of this study was to advance our search for mediators of the effects of gender and group size on perceived variability. We tested whether these effects were mediated by perceptions of group status and the number of subgroups perceived within the in-group relative to the out-group.

Method

Participants and Design. The participants were 102 first-year undergraduates at a British university. The design of the study was a $2 \times 2 \times 2$ – participant gender $\times$ group size (female-majority/male-majority) $\times$ target (in-group/out-group) – mixed quasi-experimental design, with repeated measures on the last factor. The departments selected, the proportion of the dominant group, and the absolute numbers of female and male students were as follows: *female-majority* (education 88%: 105 women, 14 males; social studies, 77%: 108 females, 32 males); *male-majority* (engineering 82%: 60 females, 277 males; physics 72%: 25 females, 63 males). The number of female and male participants per type of department was: female-majority (26 females, 18 males); male-majority (23 females, 35 males).

Procedure. As in Study One, student interviewers (nine females) approached respondents individually. We made three changes to the questionnaire used in Study One. First, at the very beginning of the questionnaire, respondents were asked to generate subgroups for male and female students in their department. They had to imagine that they were describing the subgroups to a friend, give a name to each subgroup, and write a few sentences describing what it was like and how it was different from other subgroups (instructions based on Park et al. 1992). Ten spaces were provided for each group, and the order of target group was counterbalanced. All participants then rated the perceived variability of women and men students in their department and completed the same background measures in exactly the same way as in Study One. We omitted the measures of familiarity and distinctiveness. A new measure asked respondents to rate the perceived status of in-group and out-group students in their department on 7-point scales (1 = *low status*; 7 = *high status*). Completion of the questionnaire took about 20 minutes.

Results and Discussion

Unless reported otherwise, we analyzed the data using a $2 \times 2 \times 2$ – participant gender $\times$ group size (female majority/male majority) $\times$ target group (in-group/out-group) – mixed-model ANOVA, with repeated measures on the last factor. The means for the main dependent measures are shown in Table 2.

Insert Table 2 Here

Perceived Group Size. A 2 (gender) x 2 (group size) ANOVA on the perceived percentage of male students minus the perceived percentage of female students revealed only a main effect of group size, $F(1, 98) = 77.68, p < .0001$. Participants were aware that men outnumbered women in male-majority departments ($M = 61.10, SD = 20.33$) and the reverse in female-majority departments ($M = -50.45, SD = 22.09$).

Perceived Dispersion. We computed indices of in-group and out-group variability from the three separate ratings of in-group and out-group variability on the range measure (Cronbach's alphas = .66 and .58, respectively). The ANOVA yielded a marginally significant *gender x target group* interaction, $F(1, 98) = 3.35, p < .08$, which was qualified by a significant *gender x group size x target group* interaction, $F(1, 98) = 11.78, p = .001$. When women were in the majority, neither men nor women rated the target groups differently, $F(1, 42) = 1.14, p = .292$. When men were in the majority, however, there was a significant *gender x target* interaction, $F(1, 56) = 15.92, p < .0005$. Simple main effect tests revealed a reliable out-group homogeneity effect for men, $F(1, 56) = 21.09, p < .0001$, who rated the in-group more variable than the out-group; women perceived the in-group and out-group as equally variable. The finding of an out-group homogeneity effect only for men when they were in the majority replicates Study One.

Number of Subgroups. The ANOVA yielded a significant *gender x target group* interaction, $F(1, 98) = 4.77, p = .031$, which was qualified by a significant *gender x group size x target group* interaction, $F(1, 98) = 8.41, p = .005$. For male majority departments, there was a *gender x target* interaction, $F(1, 56) = 15.42, p < .0005$, but not for female majority departments, $F(1, 42) = .216, p = .644$. Simple main effects tests showed that only men in the majority listed significantly more subgroups for the in-group than the out-group, $F(1, 56) = 17.45, p < .001$. This pattern of results is very similar to that for perceived variability.

Status. An ANOVA revealed a significant main effect of gender, $F(1, 98) = 10.80, p < .0025$, which was qualified by a significant *gender x group size x target group* interaction, $F(1, 98) = 14.36, p < .0005$. For male majority departments there was a *gender x target* interaction, $F(1, 56) = 8.07, p = .006$, as there was for female majority departments, $F(1, 42) = 6.99, p = .012$. Simple main effects analysis revealed that both women and men rated in-group status higher than out-group status only when the gender in-group was in the majority; for women in the majority, $F(1, 42) = 9.52, p = .003$; for men in the majority, $F(1, 56) = 19.93, p < .001$. Thus there was no systematic tendency, in our data, for women to see men's status as higher than women's in their department. Interestingly, this is exactly what Lorenzi-Cioldi (1998) reported from his own research. We also found no tendency for majorities to be accorded higher status than minorities. Hence, there is little evidence that perceived variability can be explained in terms of perceived differences in status.

Analysis of Covariance. We again computed an ANCOVA in which the design was 2 x 2 x 2 – participant gender x group size (female majority/ male majority) x target group (in-group/out-group) – with repeated measures on the last factor. The dependent variable was perceived variability, while the covariates were perceived group status, subgroups, and perceived group size. Neither the *gender x target* nor the *gender x group size x target* interactions were reliable, $F_s < 1$; however, the effect of subgroups was significant, $F(1, 95) = 8.68, p < .001$, while the effects of status and perceived group size were nonsignificant, $F(1, 95) = 1.56, ns$, and $F(1, 95) = 0.30, ns$, respectively. Thus, the number of subgroups perceived among male and female students seems responsible for the perceptions of group variability. To analyze whether an inverse process was possible, meaning whether the perception of subgroups was affected by perceived variability, we computed another ANCOVA, in which subgroups were considered the dependent variable and perceived

variability was included among the covariates. The results were symmetrical to those obtained before: neither the *gender x target* nor the *gender x group size x target* interactions were significant, however, perceived variability affected subgroups, $F(1, 95) = 8.68, p < .005$. Thus, these results are consistent with a bidirectional association between subgrouping and out-group homogeneity.⁸

To summarize, this study replicated the finding from Study One that men show a significant out-group homogeneity effect, but not when they are in the minority. There was again no evidence of an out-group homogeneity effect for women. This study also reported very similar patterns of data for perceived variability, subgroups, and status. However, only the relative number of subgroups generated for the in-group versus the out-group was reliably associated with out-group homogeneity, although the association was bidirectional (cf. Park et al. 1992). The general findings of our first two studies are consistent, in that gender and group size interacted to have an impact on perceived group variability. However, these findings are still subject to several interpretations, and in our final two studies we consider whether our results might be explained by differences in stereotype accuracy, and whether there is a confound between the proportion of women in a major and the status of that major.

Study Three

A possible explanation for our findings is that perceivers in different conditions might vary in stereotype accuracy as a function of gender and/or group size (for a detailed discussion of stereotype accuracy, see Judd and Park 1993; Ryan 1996; Ryan, Park, and Judd 1996). Ryan (1996) compared the stereotype accuracy of an ethnic minority (blacks) and an ethnic majority (whites). Among other measures, she assessed *dispersion accuracy* (Judd and Park 1993), the tendency to under- or overestimate the actual dispersion of group members around the group mean. Judd, Ryan, and Park (1991) reported that group members tended, in fact, to underestimate the range of distributions (i.e. they see group members as less varied than they actually are), but that they also underestimate the dispersion of the out-group more than the in-group (i.e., perceivers underestimate the dispersion of outgroup members more than they do for ingroup members). It is easy to see how such a tendency could underlie, or reinforce, the out-group homogeneity effect. Of relevance to our research, Ryan found that the minority underestimated the dispersion of group members more than the majority did, and they were less accurate. To our knowledge, there has been no previous research on differences in dispersion accuracy as a function of either gender or group size. However, if we extrapolate theoretically from Ryan's work on ethnic groups to both gender and numerosity, we would

⁸. In this second study, due to the characteristics of the experimental design, it was also possible to run regression analyses to test mediation effects. First, we computed a differential score, ingroup minus outgroup, for perceived variability, subgroups, perceived group status, and perceived group size. Then, we regressed variability and subgroups on gender (coded as 1 = Females and -1 = Males), group size (coded as 1 = Male Majority and -1 = Female Majority) and their product. The effect of the product was significant, mirroring the significant three-way interaction in the ANOVA: for perceived variability, $\beta = -.32, p = .001$, for subgroups, $\beta = -.28, p = .005$. Then, we repeated the regression analysis considering as criterion variable perceived variability and adding, among predictors, the differential scores of subgroups, perceived status and perceived size. The effect of the *gender x group size* product was no longer significant, $\beta = -.07, ns$, while the effect of subgroups was significant, $\beta = .30, p < .005$, mirroring the result of the ANCOVA. The Sobel test further demonstrated the mediational role of subgroups, $z = 2.07, p < .05$. In the reverse mediation, the effect of variability on subgroups was $\beta = .28, p < .005$ and the Sobel test was $z = 2.24, p < .05$.

predict that women and minorities would be less accurate (i.e., show greater underestimation of dispersion) than men and majorities.

At first glance, this prediction seems at odds with our knowledge from related areas. Given Fiske's (1993) work that the less powerful may be more motivated to attend to the more powerful, one might predict that the less powerful would be more accurate. However, Fiske argued only that this motivation may lead to greater effort to attend (see also Guinote 2004); it does not necessarily lead to greater accuracy. It is also well-established that women are more accurate than men at judging other's cues, especially nonverbal cues (Hall 1978) and these differences cannot be explained in terms of differences in status or dominance (Hall and Carter 1999). However, Hall and Carter found evidence of sex differences in stereotype accuracy only in the case of nonverbal behavior. These data suggest that women's stereotype accuracy is not, in general, higher than men's, but this hypothesis has never been tested with dispersion accuracy as the criterion.

Study Four investigated differences in dispersion accuracy as a function of gender and group size. To do this, we used a full design in which women and men in the majority and the minority rated themselves and both gender target groups on dimensions that were typical of either women or men and that were either positively or negatively valenced (cf. Park and Judd 1990). We followed previous research in deriving accuracy criteria from self-ratings that were provided by members of both gender groups. As suggested by Judd and Park (1993) and Ryan (1996), we operationalized dispersion accuracy as the discrepancy between the perceived and actual dispersion of a group's members about the group mean.

Method

Participants and Design. The participants were 139 first-year undergraduates at a British university. The experimental design was a 2 x 2 x 2 x 2 – participant gender x group size (female-majority/male-majority) x target group (in-group/out-group) x trait typicality (female/male) x trait valence (positive/negative) – mixed quasi-experimental design, with repeated measures on the last three factors. The departments selected, the proportion of the dominant group, and the absolute numbers of female and male students were as follows: *female-majority* (pharmacy 70%: 73 females, 31 males; english 72%: 113 females, 43 males); *male-majority* (engineering 82%: 60 females, 277 males; earth sciences, 70%: 34 females, 78 males). The number of female and male participants in each group-size condition was as follows: female-majority (37 females, 36 males); male-majority (28 females, 38 males).

Procedure. Student-interviewers, seven female and four male, approached respondents individually in the coffee rooms or study areas of their departments and asked them to complete a questionnaire. The full questionnaire took approximately 20 minutes to complete; we report here only the results for perceived group size and the ratings required for calculation of dispersion accuracy.

Perceived Dispersion. Participants rated the central tendency and range for male and female students in their department on eight 100-mm trait dimensions anchored with the endpoints *not at all* and *very*.⁹ These traits included two traits from each of four categories:

⁹ It will be noted that the measures of in-group and out-group variability in this study could be used to calculate out-group or in-group homogeneity, as in Studies One and Two. We do not report these results here, since they are reported elsewhere (Rubin, Hewstone, and Voci 2001, Experiment Three), unlike the accuracy data, which are only reported here. The results for perceived variability were comparable to those reported in Studies One and Two, with men showing a significant out-group homogeneity effect only when they were in the majority ($M_{\text{in-group}} = 56.57$, $SD = 15.86$; $M_{\text{out-group}} = 51.98$, $SD = 16.81$; $t(37) = 3.36$, $p < .003$); male students in the minority condition, and female students in general, perceived in-group

male positive (decisive and adventurous); male negative (boastful and egotistical); female positive (devoted and gentle); female negative (nagging and fussy). These traits were based on several prior studies (Eagly and Mladinic 1994; Park and Rothbart 1982; Spence, Helmreich, and Holahan 1979) and pretested on a British sample. We presented the traits in a single random order for self- and group-ratings.

Self-Ratings. Participants were asked to rate themselves on each of the eight traits on which they had previously rated in- and out-groups. The same background questions asked in Studies One and Two were used.

Results and Discussion

Perceived Group Size. A 2 (participant gender) x 2 (group size: female-majority/male-majority) ANOVA on the perceived percentage of male students minus the perceived percentage of female students revealed a main effect of group size, $F(1, 135) = 531.07, p < .0001$. Participants were aware that men outnumbered women in male-majority departments ($M = 52.79, SD = 24.63$) and *vice versa* in female-majority departments ($M = -37.50, SD = 16.42$).

Perceived-Actual Discrepancies in Dispersion. To assess dispersion accuracy, we first calculated for each attribute dimension the difference between the highest and the lowest self-ratings provided by the sample of members of that group (i.e., the actual range). We then computed perceived-actual discrepancies, reflecting the extent to which participants' judgments over- or underestimated the target groups' aggregate self-judgments. For each participant, we subtracted the actual range from the perceived range for each dimension (for means see Table 3). Thus, positive discrepancies reflected overestimation and negative discrepancies reflected underestimation of the actual range computed from target group members' self-ratings.

Insert Table 3 Here

First we performed a one-sample *t*-test on the index of perceived-actual discrepancy, using zero as the test value. Participants systematically underestimated the dispersion of group members ($M = -30.86, SD = 15.70; t(138) = 23.18, p < .001$). This finding is consistent with previous research indicating that people tend to underestimate the range of distributions (Judd et al. 1991; Ryan 1996) and are quite inaccurate (although to use simpler language we will still talk in terms of relative accuracy).

We then computed a 2 x 2 x 2 x 2 x 2 – participant gender x group size (female majority/male majority) x target group (in-group/out-group) x trait valence (positive/negative) x trait stereotypicality (stereotypical/counterstereotypical) – mixed-model ANOVA, with repeated measures on the last three factors. There was a significant main effect of gender, $F(1, 135) = 10.81, p < .002$, showing that women ($M = -35.66, SD = 15.35$) were less accurate than men ($M = -26.63, SD = 14.85$), consistent with Ryan's (1996) finding that members of social minorities (here women) perceive stereotype dispersion less accurately than members of social majorities. However, this effect was qualified by a significant *gender x target-group* interaction, $F(1, 135) = 152.12, p < .0001$. Women were more accurate when judging the in-group ($M = -29.36, SD = 16.82$) than the out-group ($M = -41.97, SD = 15.26$), whereas men were less accurate for the in-group ($M = -31.53, SD = 14.93$) than for the out-group ($M = -21.73, SD = 16.86$). This can also be interpreted as a target-group effect (judgments concerning women were more accurate than judgments concerning men, or participants underestimated the dispersion of men more than women).

Two four-way interactions were significant (*gender x group size x target-group x stereotypicality*, $F(1, 135) = 24.80, p < .0001$; *gender x group size x target-group x valence*

and out-group as equally variable ($ts \leq 1.09, ns$).

interaction, $F(1, 135) = 45.58, p < .0001$). However, the in-group accuracy effect for women and the out-group accuracy effect for men were still reliable in almost all conditions. Importantly, women showed the in-group accuracy effect unless they were in the majority rating target groups on stereotypical dimensions, and men showed the out-group accuracy effect unless they were in the minority rating on either stereotypical or positive dimensions. Both effects were more prominent on counterstereotypical dimensions.¹⁰

Can these findings help to explain our reported effects of gender and group size on perceived variability? In this study we found that dispersion accuracy, like perceived variability, was moderated by gender and group size, but the pattern of results indicates that the accuracy data cannot explain the consistent results for variability data reported in Studies One and Two. We found that women underestimated the dispersion of the out-group compared with the in-group. If dispersion accuracy were related to perceived variability, then we might have expected women to see their gender out-group as less variable than the in-group (i.e., an out-group homogeneity effect). Men, in contrast, underestimated the dispersion of the in-group compared with the out-group. On this basis we might have expected men to see their in-group as less variable than the out-group (i.e., no out-group homogeneity effect or even an in-group homogeneity effect).

Our consistent pattern of results for perceived variability was, of course, exactly the opposite of these extrapolations from accuracy to variability. We found an out-group homogeneity effect for men, unless they were outnumbered by women, but no effect for women. Thus, these results are inconsistent with an explanation for our out-group homogeneity effects in terms of parallel effects of gender and group size on dispersion accuracy. We should, however, note two limitations of this study. First, the self-ratings (with which perceptions were compared) should ideally be collected from *all* members of the group (e.g., all female pharmacy majors). Since we were only able to collect data from a sample, it is possible that these data were provided by individuals who may not have been representative of the gender groups that were judged. Second, we could not test directly the relationship between dispersion accuracy and perceived variability, because both measures share some common component. This limitation could be overcome in a future study using a different measure of either accuracy or perceived variability.

¹⁰ The in-group accuracy effect for women was significant on counterstereotypical dimensions, whether the in-group was in the majority, $F(1, 36) = 157.59, p < .001$, or the minority, $F(1, 27) = 76.65, p < .001$. They also showed the effect on stereotypical dimensions when they were in the minority, $F(1, 27) = 6.28, p < .05$, but not the majority, $F(1, 36) = 0.61, ns$. The effect was significant in all four group size by valence conditions: in-group minority, positive traits: $F(1, 27) = 56.22, p < .001$; in-group minority, negative traits: $F(1, 27) = 16.69, p < .001$; in-group majority, positive traits, $F(1, 36) = 19.19, p < .001$; and in-group majority, negative traits, $F(1, 36) = 61.11, p < .001$. The out-group accuracy effect for men was significant on counter-stereotypical dimensions, whether the in-group was in the majority, $F(1, 38) = 43.47, p < .001$, or the minority, $F(1, 34) = 60.65, p < .001$. Men also showed the effect on stereotypical dimensions when they were in the majority, $F(1, 38) = 8.18, p < .01$, but not when they were in the minority, $F(1, 34) = 0.48, ns$. The effect was especially evident on negative dimensions, whether the in-group was in the majority, $F(1, 38) = 17.46, p < .001$, or the minority, $F(1, 34) = 67.29, p < .001$; it was still found on positive dimensions, when men were in the majority, $F(1, 38) = 24.62, p < .001$, but not when they were in the minority, $F(1, 34) = .05, ns$.

Study Four

A potential problem involved in studying gender and group size in academic majors is that the perceived status of a major can vary with the numbers of women in that department. If this were the case, then our manipulation of group size would be confounded with the perceived status of the major in the university as a whole. Male-majority departments (which tend to be stereotypical male majors, e.g., engineering) might be accorded higher status than female-majority departments (which tend to be stereotypical female majors, e.g., education). This is a different conception of status than the one that we assessed in Study Two, which referred to the perceived status of women and men students in each department, but an important one to address, given prior research on gender proportions and occupational prestige.

There is evidence that jobs dominated by men are accorded higher prestige (Jacobs and Powell 1985; but cf. Glick 1991) and pay better wages (Glick 1991) than those dominated by women. In addition, increases in the number of women who enter male-dominated occupations reduce the prestige of that occupation (Shaffer et al. 1986). Touhey (1974) found that telling students (both male and female) that more women would soon be entering several high-status occupations decreased their ratings of the jobs' prestige, although there have been several failures to replicate this latter effect (Glick 1991). If students' perceptions follow a similar pattern, then male-majority departments might enjoy consistently higher status than female-majority departments. To address this potential problem, and to provide an additional experimental test of how gender proportions might affect status, we both measured and manipulated the effect of group proportions in this study. We asked female and male students from across the university to rate the status of all the majors used in our research and to estimate the proportion of women students in each. Half the participants rated status first, then the proportions of women; the remaining participants rated the proportions of women first, then status, which we reasoned might prime any negative societal association between proportion of women and status.

Method

Participants and Design. The participants were 60 undergraduates drawn from across a British university (31 females and 29 males). The design of the study was a 2 x 2 x 3 – participant gender x order of tasks (estimate of proportion of females/rated status of department) x type of major (female-majority/parity/male-majority) – mixed quasi-experimental design, with repeated measures on the last factor.

Procedure. Students completed the ratings in individual sessions held in the laboratory. On separate questionnaires, students estimated the proportion of female students in, and rated the status of, each of the majors from which participants were drawn for Studies One through Three. Approximately half of the participants estimated the proportion of females first, and then rated each major's status second. The remaining participants completed these two tasks in the reverse order. Two random orders of the majors were used for each set of ratings. We assessed proportions by asking participants "to consider a list of majors at the University, and circle what you think the percentage (%) of women students in each major is, to the nearest 10%" on an eleven-point scale ranging from 0% to 100%. We assessed status by asking participants to mark on a seven-point scale what status they thought each major had in the university as a whole (1 = *very low status*; 7 = *very high status*). The same background questions asked in the previous studies were used. Completion of the questionnaire took about five minutes.

Results and Discussion

Estimated Proportion of Female Students. The ANOVA showed, as expected, a significant main effect for type of major, $F(2, 112) = 276.18, p < .0001$, revealing that

participants were aware of the differing proportions of women students in female-majority ($M = 69.37$, $SD = 7.58$), parity ($M = 46.59$, $SD = 11.14$) and male-majority ($M = 34.60$, $SD = 9.17$) majors. All pairwise comparisons were significant (Newman-Keuls, $p < .05$). There was also a significant interaction between type of major and gender, $F(2, 112) = 8.84$, $p < .001$, which did not qualify the main effect and occurred only because men perceived a greater proportion of women in parity majors ($M = 51.21$, $SD = 9.51$) than did women ($M = 42.26$, $SD = 10.94$), $F(1, 56) = 11.36$, $p = .001$.

Status. The ANOVA showed only a significant main effect for type of major, $F(2, 112) = 23.37$, $p < .0005$. This was due to participants rating parity majors ($M = 5.20$, $SD = 0.87$) higher than both female-majority majors ($M = 4.66$, $SD = 0.75$) and male-majority major ($M = 4.50$, $SD = 0.83$; Newman-Keuls, $p < .05$). No other effects even approached significance. There was no evidence that participants rated majors with a higher proportion of women lower in status nor were participants' status ratings affected by completing prior estimates of the proportion of women.

Correlations. Finally, we analyzed the possible presence of an association between the estimated number of women and the rated status of the different majors. First, we computed within-participants correlations across the departments. Then, we transformed them to Fisher's z' scores. Finally, we averaged these values across participants. These final mean correlations were not different from zero, either for women, $z' = -.03$, or for men, $z' = .06$.

Overall, these results indicate that students were aware of how proportions of female students varied across majors. There was, however, no evidence that students accorded female-majority majors lower status than male-majority departments, that priming the proportions of women students in a major affected its rated status, or that ratings of the proportion of women and status were associated.

General Discussion

The results across our first two studies yielded a remarkably consistent picture of how gender and group size moderate perceived group variability and the occurrence of out-group homogeneity effects. Using a conventional, direct measure of perceived dispersion, we replicated previous research that the out-group homogeneity is a relatively strong effect among men, but weaker among women (e.g., Brown and Smith 1989; Lorenzi-Cioldi 1998; Young et al. 1999). We qualified and extended these findings in important ways. We found that men showed the out-group homogeneity effect only as long as their gender in-group was not in the minority. We found no evidence at all of an out-group homogeneity effect for women, but rather women viewed in- and out-groups as equally variable. These results provide some support for each of the main theoretical perspectives considered (Kanter 1977a, b; Lorenzi-Cioldi 1998; Simon 1992), but together our studies go beyond previous research in demonstrating the limits of, and providing explanations for, effects of both gender and group size.

In the case of gender, our findings for perceived dispersion qualify Lorenzi-Cioldi's (1998; Lorenzi-Cioldi et al. 1995) conclusion. Whereas he argues for a main effect of gender, which he explains in terms of status, we found an interaction with group size and little evidence of a key role for status. Lorenzi-Cioldi explained gender effects on perceived variability in terms of an association between both gender and status, and status and variability. He noted that women tend to have lower status than men (cf. Ridgeway and Smith-Lovin 1999) and low-status groups tend to be perceived as less variable than high-status groups (e.g., Brewer 1993). Further, women's status makes their gender category more salient, leading them to perceive themselves as more of a group, whereas high-status men resist depersonalization and assert their uniqueness (Lorenzi-Cioldi 1998). Our data deviate from this theoretical account in three ways. First, women did not report feeling more distinctive in

general than men (Study One), which we might expect them to do if their gender category were especially salient. Second, we demonstrated that status differences could not mediate perceived variability, because there was no systematic tendency in this context for women to judge men as having higher status than women in their major (Study Two), as Lorenzi-Cioldi (1998) has found. Third, there was no evidence for an indirect status effect, whereby majors with a higher proportion of women students were accorded lower status (Study Four).

Notwithstanding these findings, we acknowledge some limitations of our work. Our single-item measure of group status had the advantage of being simple, direct, and less likely to compound social desirability biases (for a similar argument, see Robins, Hendin, and Trzesniewski 2001). However, it may also have been less sensitive and reliable than multi-item measures of status. Although Lorenzi-Cioldi (1998) also found scant evidence of a gender-based status difference using a three-item measure of status, Stewart and colleagues (2004, 2006; Stewart and Vassar 2000) found a significant difference using a nine- or ten-item measure. Unfortunately, however, Stewart and colleagues did not find significant gender out-group homogeneity effects using their name-matching measure. Future researchers may wish to use Stewart et al.'s multi-item measure of status in combination with the range measure of perceived group variability in order to provide the most accurate test of our hypotheses.

We also limited our measure of status specifically to each department. Future research might unpack the concept in a more refined manner than we have done, looking at different types of status and assessing whether specific dimensions moderate or mediate perceived group variability. There is plentiful evidence that both men and women perceive men to hold higher status than women (e.g., Stewart and Vassar 2000; Stewart et al. 2000; Stewart et al. 2007), and future research should include measures of perceived status both within departments/specific work group settings (as here) and of men and women in general. It might, for example, be that the general pattern of data that we report stems, ultimately, from an interaction between group size and societal status. Thus, status is a kind of implicit, assumed variable in these studies. We observed that when men are in the majority they reap the benefits of higher numerical and general societal status, leading both men and women to individuate, and thus to perceive greater variability among men than women (Lorenzi-Cioldi 1998). Women, in contrast, do not reap the benefits of being in the higher status numerical majority group, because of the lower status assigned to women in society. Thus, for women, numerical majority status is not sufficient to overcome lower perceived social status (for a comparable effect, whereby male professors are individuated more than male graduate students, female professors are not individuated more than female graduate students, see Stewart and Vassar 2000). In this sense, the overall pattern of results suggests that status is not a predictor of perceived variability, as group size must also be taken into account. What we have is a baseline (an out-group homogeneity effect for men, symmetry for women) that is moderated by group size, although this moderation is greater for men than women.

Although some perspectives predict an in-group homogeneity effect for women (Brown and Smith 1989; Simon 1992), we noted that from Swan and Wyer's (1997) research one could also predict the opposite, namely greater in-group heterogeneity (i.e., an out-group homogeneity effect). We found no out-group homogeneity effect for women. In fact, women consistently perceived gender in- and out-groups as equally variable. Although this outcome could be predicted by both Oakes et al. (1994) and Horwitz and Rabbie (1982), women showed no tendency to perceive target groups as either more homogeneous or more heterogeneous than men, as these two perspectives imply respectively.

Thus, although we concur with Lorenzi-Cioldi that there are gender differences in perceived variability, we do not agree that they are general and pervasive, deriving from stable differences in the mental representation of groups differing in status (Lorenzi-Cioldi 1993,

1998). Rather, we see gender effects as tendencies that, quite reasonably, vary as a function of the social context, including factors such as whether the in-group is a numerical majority or minority. Thus, we can only attempt to explain the present set of results by considering how gender and group size interact to determine perceived variability.

With regard to the impact of group size, several studies have found that the out-group homogeneity effect is smaller in minorities than majorities (Brewer 1993; Lorenzi-Cioldi 1998; Simon 1992, 1998). Again, this effect is explained in terms of status. Both Simon (1992) and Lorenzi-Cioldi (1998) argued that in-group majority and minority size imply high and low status, respectively, which increases category salience for members of the minority (e.g., Simon and Hamilton 1994) and leads to perceived in-group homogeneity. Although we found no main effect of group size on variability, it did of course interact with gender. This was also the pattern with the other measures that are central to the status account. First, we found some evidence that both women and men as members of the minority felt more distinctive than as members of a majority (Studies One and Two), although there was no main effect of group size. These minority members did not, however, report feeling less satisfied or comfortable, as we had predicted from Kanter's (1977a, b) work. Second, there was no main effect of group size on status, although we did find that both men and women rated the status of in- and out-groups differently (higher for the in-group) only when the in-group was in the majority (Study Two). Overall, then, size did affect perceived variability, distinctiveness, and status, but primarily in interaction with gender. We predicted that the out-group homogeneity effect for men would be greatest when they were in the majority; this was not the case. Rather, the effect was equivalent in parity and in-group majority settings, but disappeared when the in-group was in the minority. This is powerful testimony to the impact of group size and shows that group proportions can affect men and not just women (cf. Sackett et al. 1991).

Our research also investigated a number of potential mediators, alternative explanations, and confounds of gender and group size effects on out-group homogeneity. With regard to mediators, we could find no support for familiarity (Study One; see also, Park et al. 1992; Stewart et al. 2006) and no association with status (Study Two). Relative in-group *subgrouping* (the tendency to think more about the in-group than the out-group in terms of subgroups) was, however, associated with perceived variability. In Study Two, we revealed that gender and group size interacted to affect relative in-group subgrouping, which in turn was associated with out-group homogeneity (Study Two). However, we could not conclude that out-group homogeneity was mediated by relative in-group subgrouping in a unidirectional relation (thus qualifying Park et al.'s 1992 conclusion that subgrouping mediates out-group homogeneity). The association between out-group homogeneity and subgrouping was, in fact, bidirectional, which makes intuitive sense. To illustrate, we might expect a man who perceived women as relatively heterogeneous to have multiple subgroups of them, but we might equally well expect a man who has multiple subgroups of women to view them as relatively heterogeneous. The problem here, however, is whether subgrouping can be considered to have the status of a correlate or even mediator of perceived variability or whether it is, in fact, itself a measure (albeit a more indirect one) of perceived variability (for more detailed discussion of subgrouping and perceived variability, see Richards and Hewstone 2001; for a detailed analysis of measures of out-group homogeneity, and the view that the subgrouping task is, in fact, one such measure, see Boldry et al. 2007). To answer this question, future research should extend Park and Judd's (1990) analysis of the relationship between different measures of perceived group variability by including both conventional rating measures and more indirect measures such as subgrouping, confusions in memory (e.g., Lorenzi-Cioldi et al. 1995), and item clustering in memory (e.g., Sedikides 1997).

Future research should also follow up the intriguing possibility of a link between the gender difference in both self-construals (measured as an individual difference; see Singelis 1994) and susceptibility to the out-group homogeneity effect in conjunction with group size. If men and women tend to adopt independent and interdependent self-construals respectively (Cross and Madson 1997), and this is linked to both subgrouping and perceived out-group homogeneity, then it should be possible to demonstrate reliable correlations between these measures. Further, if some men have interdependent, and some women independent, self-construals, then we would expect these atypical individuals to show atypical patterns of subgrouping and perceived homogeneity (i.e., some men would show an in-group homogeneity effect, and some women an out-group homogeneity effect). It would be interesting to manipulate some of these variables experimentally. It may then be possible to show that changes in self-construal, or being in an in-group majority or minority, can cause changes in subgrouping and/or perceived homogeneity. To our knowledge, no one has related self-construals to perceived variability.

We should also not lose sight of the important insight from Stewart et al. (2000) that social attitudes moderate perceived variability effects for gender groups. It is now well-replicated that progressive men and women individuate women to a greater extent than men, and that traditional men and women individuate men more than women. This might help to explain why the out-group homogeneity effect is sometimes found for women, and sometimes not. The divergent attitudes of women in our sample might, for example, cancel one another out.

Because we studied natural groups in a field setting, we also had to consider alternative explanations for, and possible confounds underlying, our findings. We considered, and ruled out, two alternative interpretations. First, we tested whether there were differences in stereotype accuracy across conditions. We found that women were, in fact, less accurate than men at perceiving dispersion, but in addition women were more accurate when judging the in- than the out-group, while the reverse was true for men (Study Three). Since perceivers underestimated the dispersion of group members about the mean (as found by Judd et al. 1991; Ryan 1996), relative in-group accuracy for women meant that they especially underestimated out-group dispersion, while men especially underestimated in-group dispersion. Far from explaining our pattern of findings, if dispersion accuracy were related to the out-group homogeneity effect, then the effect should have been more evident for women than men, which is exactly the opposite of what we found. Second, we showed that our findings could not be explained in terms of a confound between the proportion of women students taking a major and its status. Students did not rate female-majority majors as having lower status than male-majority majors, nor did priming the proportion of women in a major affect ratings of its status (Study Four).

Although we believe that we have made a strong case for the reliability of our findings, we reiterate Brauer and Judd's (2000) note of caution. In designs like those used in our research, and almost all studies on perceived variability that have participant and target group factors, the target group (men/women) main effect is identical to the interaction between target group and participant group (see also Ryan and Bogart 1997). Brauer and Judd discuss a number of methodological strategies to address this problem, including the use of more than two participant groups and target groups. With gender groups, however, this is, of course, impossible. Theoretically, however, the two possible effects (a stronger out-group homogeneity effect for men versus a target group effect) are quite different (Rubin et al. 2004). On the one hand, perhaps men and women do differ in their tendency to differentiate gender in- and out-groups, an effect that we have shown varies with the majority/minority context. On the other hand, perhaps men tend to be seen as more heterogeneous than women,

except when they are in the minority, and women tend to be seen as more homogeneous, except what they are in the majority.

To conclude, the reported studies confirm Kanter's (1977a, b) influential ideas concerning the impact of group proportions on social life. More specifically, our findings show that group size and gender interact to exert systematic effects on perceived group variability. We found a significant out-group homogeneity effect for men, but not for women. This is consistent with Lorenzi-Cioldi's (1993; Lorenzi-Cioldi et al. 1995) findings, but we found this effect to be moderated by group size. Men demonstrated the effect except when they were in the minority; women demonstrated no out-group homogeneity effect, but rather perceived in-group and out-group as equally variable. These differences in perceived variability were associated with a tendency to make more subgroup differentiations within the in- than the out-group, but not consistently with familiarity, distinctiveness, perceived group size, or status. Finally, although we studied natural groups in a field setting, we were able to rule out alternative explanations in terms of stereotype accuracy and status. Overall, these findings indicate that women are likely to be stereotyped (in the sense of being perceived as homogenous) except when they outnumber men; this suggests the need for vigilance and awareness concerning stereotyping, even when gender groups are of comparable size in a given setting. Without such vigilance, specific individuals are likely to be judged in a stereotyping manner, stereotype-disconfirming information is likely to be overlooked, and stereotypes are likely to be maintained. We suggest that these findings have implications for gender inequalities, and where they will be most persistent, especially in the workplace and educational settings where the relative proportions of the two groups are evident.

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