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Perceptions of gender group variability in majority and minority contexts:

Two field studies with nurses and police officers

Miles Hewstone

University of Oxford

Richard J. Crisp

University of Kent

Rhiannon N. Turner

University of Leeds

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INGROUP HOMOGENEITY

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Abstract

Two field studies demonstrated that majority and minority size moderate perceived group variability. In Study 1 we found an outgroup homogeneity (OH) effect for female nurses in the majority, but an ingroup homogeneity (IH) effect for a ‘token’ minority of male nurses. In Study 2 we found similar effects in a different setting, an OH effect for policemen in the majority and an IH effect for policewomen in the minority. Although measures of visibility, status and, especially, familiarity tended to show the same pattern as perceived variability, there was no evidence that they mediated perceived dispersion. We discuss results in terms of group size, rather than gender, as moderators of perceived variability, and Kanter’s (1977a, b) theory of group proportions.

Perceptions of gender group variability in majority and minority contexts:

Two field studies with nurses and police officers

The reliable tendency to perceive outgroups as less variable, or more homogeneous, than ingroups (the ‘outgroup homogeneity effect’; Jones, Wood & Quattrone, 1981) has widespread consequences for stereotyping and intergroup relations (see Park, Judd & Ryan, 1991).

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

Despite the profusion of laboratory studies of perceived variability (for reviews, see Devos, Comby & Deschamps, 1996; Linville, 1998; Ostrom & Sedikides, 1992; Voci, 2000), there have been relatively few field studies using natural groups. It is, however, important that we continue to study such phenomena outside the laboratory, because natural groups pose fascinating questions, the answers to which ultimately enrich our theories. Yet, the use of natural groups frequently brings with it unavoidable confounds (as between group size, status and power; see Farley, 1982), which limit our ability to draw precise conclusions from them. Brown and Smith (1989) investigated men and women academics’ perceptions of their gender ingroup and outgroup in their university, where women were in a very small numerical minority, and had low status compared with men. They found that both participant groups rated the female minority more homogeneous than the male majority (i.e., the women rated their ingroup more homogeneous than the outgroup, whereas the men rated their ingroup more heterogeneous than the outgroup). Brown and Smith concluded that academic men, the majority, showed an outgroup homogeneity, or OH, effect, whereas academic women, the minority, showed an opposite, ingroup homogeneity, or IH, effect (Smith & Brown, 1987).

Brown and Smith's (1989) findings suggested that being in a distinct minority may heighten women's consciousness of their stigmatized status and/or gender group. Some other research outside the literature on perceived variability has also reported that this awareness increases women's perceived similarity to women as a group (Foster & Matheson, 1998; Hogg & Turner, 1987), which is consistent with an IH effect. However, Swan and Wyer (1997) found the opposite effect, that making women conscious of their gender, via numerical distinctiveness, made them more aware of their low social status, but that this led them to distinguish themselves from other members of this low-status category, which suggests ingroup *heterogeneity*, rather than homogeneity.

Because Brown and Smith (1989) were only able to study a female minority and a male majority, it is impossible to attribute their results to a gender effect for female academics, their minority group size, or their lower status in this setting. In the reported research, we addressed this problem by conducting two field studies, each using a different professional group (nurses and police officers, respectively) which provided the opportunity to study both women and men in the majority *and* the minority. These complementary settings are important, because there is evidence, first, that both gender and group size moderate perceived variability and, second, that the effects of group proportions vary as a function of gender. We will review each of these literatures briefly, and then state our hypotheses.

Gender and group size as moderators of perceived variability

There is evidence that both gender and group size can moderate perceived variability, although how reliable the effects are, and what drives them, is still debated (see Hewstone, Crisp, Richards, Voci, & Rubin, 2007). With regard to gender, Lorenzi-Cioldi (1993, 1998; Lorenzi-Cioldi, Eagly & Stewart, 1995) has argued that the OH effect appears to be relatively strong among men, but weaker, even becoming an IH effect, among women (see also Linville, Fischer, & Salovey, 1989), although it is not always found even among men (Stewart, Vassar, Sanchez, & David, 2000). Lorenzi-Cioldi (1998) contended that this gender effect may be best understood in

terms of status (see also Stewart & Vassar, 2000). Gender is typically confounded with status (Eagly, 1987; Geis, 1993; Ridgeway & Diekema, 1992; Ridgeway & Smith-Lovin, 1999), and status can affect category differentiation (Brewer, 1993; Fiske, 1993; but see Brauer, 2000).

High-status groups tend to be perceived as collections of distinct individuals (i.e., heterogeneous), whereas low-status groups tend to be perceived as aggregates of interchangeable individuals (i.e., homogeneous), independent of differences in power (Boldry & Gaertner, 2006; for effects of power, see Guinote, 2004). Lorenzi-Cioldi (1998) also argued that gender is a more salient category for women than men, because of their lower status; moreover, men may find it harder, or be more reluctant, to identify with their gender category than is the case for women (see Branscombe, 1998; Fajak & Haslam, 1998). Hence women are more likely to both perceive themselves and be perceived as more of a group, whereas men are more likely to perceive themselves and be perceived as a collection of individuals (as reported by Young, van Knippenberg, Ellemers, & de Vries, 1999; see also Cross & Madson, 1997). The major weakness of the status account, however, is that where studies have included a direct measure of perceived status, they have consistently reported null effects (see Hewstone et al., 2007, Studies 3 & 4; Lorenzi-Cioldi, 1998), a result Lorenzi-Cioldi (1998) attributes to social desirability concerns or political correctness.

Group size can also affect perceived variability. Simon (1992; Simon & Brown, 1987) argued that members of non-minority groups show a relative OH effect, but members of minority groups show a relative IH effect (e.g., Simon & Brown, 1987; Simon & Pettigrew, 1990; see also Mullen & Hu, 1989, for meta-analytic support). Although, on statistical grounds, larger samples are more variable than smaller ones (see Bartsch & Judd, 1993), this cannot be the whole explanation. There is only a weak or non-significant correlation between perceived group size and outgroup homogeneity (Simon & Mummendey, 1990), and participants who are not assigned to groups do not perceive the minority as more homogeneous than the majority (Simon & Brown, 1987).

Simon (1992) proposed an explanation of group-size effects in terms of category salience, threat to self-esteem, and status. Being in a minority, which anyway tends to make group membership more salient (see Brewer, 1993; Mullen, Brown & Smith, 1992), may pose a threat to group members' self-esteem. Minority members may respond by perceiving their ingroup as more homogeneous; thus they stereotype themselves more in terms of their minority group membership, promoting ingroup solidarity and accentuating social identity (Tajfel & Turner, 1986; see Ellemers & van Rijswijk, 1997). Because group size tends to be correlated with status (see Farley, 1982), members of majority groups who have relatively high ingroup status show an OH effect, whereas the typically low status of minority groups increases category salience and leads to an IH effect (see Lorenzi-Cioldi, 1998; Simon & Hamilton, 1994).

As we noted above, one prominent explanation for both gender and group-size effects on perceived variability is based on status (Lorenzi-Cioldi, 1998; Simon, 1992), although evidence for this account is still limited. Another potential explanation for both effects could be framed in terms of familiarity. Linville and colleagues have argued that greater familiarity with the ingroup (compared with the outgroup) will lead to storage and retrieval of relatively more exemplars from the ingroup and is, thus, a “natural mechanism” leading to outgroup homogeneity (Linville, 1998). Although Linville and colleagues have reported data consistent with their model (e.g., Linville & Fischer, 1993; Linville, Fischer & Salovey, 1989; Linville, Salovey, & Fischer, 1986), familiarity cannot be the only explanation for OH effects: these effects arise even in minimal groups studies where the participant is familiar with neither ingroup or outgroup members (Judd & Park, 1988). But despite this, familiarity could still be especially important in natural groups, and could help to explain why both gender and group size moderate the OH effect.

Regarding gender, Linville and colleagues (1989, Expt. 3) originally predicted, and found, that gender groups would not yield an OH effect, because the two groups were equally familiar. However, several other studies have found OH effects for gender groups (Mackie, Sherman, &

Worth, 1993; Park & Judd, 1990; Lorenzi-Cioldi, 1993; Lorenzi-Cioldi et al., 1995; Park & Rothbart, 1982; Young et al., 1999). Park and Rothbart (1982) proposed that a general functional explanation for relative ingroup familiarity, whereby we pay more attention to the ingroup because we have a greater need to distinguish its members from one other than we do for the outgroup, applies just as well to gender groups as to other groups. However, to explain that gender moderated perceived variability, this account would have to be extended to argue that men showed a relative ingroup familiarity effect, but that women did not (or even showed a relative outgroup familiarity effect). This, however, only seems likely when men are the majority and women the minority. Regarding group size, it is reasonable to propose that familiarity could explain a stronger OH effect for majorities than minorities: members of a minority *are* more likely to be familiar with members of a majority than *vice versa* (they have a higher probability of meeting them). We therefore included measures of familiarity in our research to test whether it could account for group-size and/or gender effects.

Effects of group proportions as a function of gender

Kanter (1977a, b) provided a pioneering sociological analysis of the effects of group size in her work on the consequences of 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. The existence of such skewed groups is immediately obvious in cases where women are referred to as hyphenated group members (e.g., ‘woman-police officer’).

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 hence feel ‘different’ (cf. Milliken & Martins, 1996; Taylor, Fiske, Etcoff, & Ruderman, 1978). 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 subgroups (cf. Tajfel & Wilkes, 1963). Assimilation refers to the fact that tokens' personal characteristics tend to be distorted to fit the generalization, or stereotype. There is extensive evidence that token women suffer from stereotyping and discrimination, and that they are likely to be perceived as physically weak and lacking in leadership qualities (for reviews see Niemann & Dovidio, 1998; Yoder, 1994). Critics have, however, identified a number of key limitations to Kanter's theory, of which the most damaging refer to her confounding numerical proportions with three other factors -- (gender) status, occupational inappropriateness and intrusiveness (see Yoder, 1991, 1994).

As we noted earlier, status is typically confounded with gender (see Ridgeway & Smith-Lovin, 1999), and several studies have found that token men (e.g., male nurses, Fløge & Merrill, 1986; Fottler, 1976; Ott, 1989) avoid the negative consequences of numerical imbalance (see also Fairhurst & Snavely, 1983a, b). In fact, visibility may have no effect on men (Sackett, DuBois, & Noe, 1991) or even confer advantages such as enhanced promotional opportunities (e.g., Heikes, 1991). Thus Kanter may have identified consequences of membership in numerically small groups with low status (see Alexander & Thoits, 1985; Frable, 1993) or cultural stigma (Crocker & Major, 1989; Frable, Blackstone, & Scherbaum, 1990; Major & Crocker, 1993), rather than specific effects associated with gender and group proportions (see Niemann & Dovidio, 1998).

The occupational inappropriateness of a profession refers to its stereotyping. As Yoder (1991) noted, Kanter (1977a, b) focused on the sex ratio in the work group, but two other sex ratios (for the occupation as a whole, and for the organization as a whole) should also be considered. Yoder pointed out that all of the studies on female and male tokens involved gender-inappropriate occupations (e.g., women police officers, Martin, 1980; and male nurses, Ott, 1989), and these showed that distinctive women in gender-inappropriate occupations do suffer in the ways outlined by Kanter, but men do not.

Intrusiveness refers to those pioneer members of the minority group who are the first, or the first significant cohort, to break into a new occupation or organization (Laws, 1975; Yoder,

1991, 1994). In such cases, while women may benefit from decreased distinctiveness as their numbers increase, as Kanter envisaged, the majority may perceive their increasing proportions as a threat to their own status, and react with increased discrimination (see Blalock, 1967; South, Bonjean, Markham, & Corder, 1982), which does not level off until the minority proportion of the whole group reaches about 30-40% (see Allmendinger & Hackman, 1995). Men in male-dominated occupations may react especially strongly to women's intruding, because jobs dominated by men are accorded higher prestige (e.g., Jacobs & Powell, 1985; but cf. Glick, 1991) and pay better wages (Glick, 1991), benefits which are likely to be eroded with the intrusion of women in significant numbers (see Allmendinger & Hackman, 1995). In contrast, women may believe, or at least hope, that the intrusion of men into their less prestigious, female-dominated occupations will increase their pay and prestige.

Based on this review of the literature, we can conclude that token group proportions can be associated with the negative consequences Kanter (1977a, b) outlined, but that these effects will occur primarily, and be strongest, when the token group has low status and/or is stigmatized, and is attempting to pass into a traditionally inappropriate occupation for the first time.

Perceived variability and group proportions

We sought to integrate research on perceived group variability with Kanter's theory by proposing that perceived group variability assesses exactly what she had in mind when writing of assimilation, the least-studied process in tests of Kanter's theory (see Hewstone et al., 2007). This link is implicit in Kanter's (1977a, b) own writings. She gives as an example of assimilation, dominants' mistaking one token for another; several researchers have used just such a measure of within-group confusion (see Taylor et al., 1978) *as* a measure of perceived group variability (e.g., Lorenzi-Cioldi, 1998; Lorenzi-Cioldi et al., 1995; Stewart, Vassar, Sanchez, & David, 2000; Young et al., 1999). 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” (1977 b, p. 966). From Kanter’s work we would expect an OH effect for majorities, because their members would be more likely to polarize members of small minorities and assimilate their members to the stereotype. We might also expect an IH effect for members of small minorities, if their feelings of distinctiveness, discomfort and dissatisfaction promote a sense of threat to which they respond by seeing their own group as united and cohesive (Brown & Smith, 1989; Simon, 1992).

The present research sought to integrate primarily social-psychological findings on perceived group variability with primarily sociological work on the effects of relative group proportions. We did this by extending Brown and Smith's (1989) study of perceived variability among social groups in majority and minority settings and, like them, we studied these issues in natural groups and real settings, capitalizing on existing variation in the gender ratios of occupational groups. In both studies we conducted, the minority was occupationally distinct (Niemann & Dovidio, 1998), occupationally inappropriate (Laws, 1975) and intrusive (Laws, 1975; Yoder, 1991, 1994), but by conducting the two studies, we were able to investigate both men and women in the majority and in the minority. We compared perceptions of ingroup and outgroup variability under each sex ratio, as well as ratings of personal distinctiveness and perceived group status. We investigated whether gender and group size moderate perceived group variability, and whether perceived variability is mediated by distinctiveness, familiarity, status, and perceived group size. Because the proportions of the gender groups reversed across the two studies, we outline our hypotheses separately for each study.

Study 1

The research context for our first study was the nursing profession in the U.K. where men are distinctly under-represented, accounting for only nine per cent of nurses nationally, despite the first male nurse being registered in 1923, and male nurses being admitted to the

Royal College of Nursing in 1960 (see Abel-Smith, 1960). Although previous studies have found that token male nurses avoid the negative consequences of numerical imbalance (e.g., Floge & Merrill, 1986; Fottler, 1976; Ott, 1989; see Fairhurst & Snively, 1983a, b), we still expected them to feel more distinctive, as a ‘token’ minority, than majority female nurses.

Based on previous research, effects of gender and group size should conflict in this study, rendering it difficult to make precise predictions for perceived variability. On the one hand, the OH effect is stronger for (higher status) men (Lorenzi-Cioldi, 1998), but this effect would be opposed in the present context because men were in a small minority (see Brewer, 1993; Simon, 1992). Indeed, men might even show an IH effect, although the IH effect is generally weaker than the OH effect (see Voci, 2000), and men may be less affected by group proportions than are women (Sackett et al., 1991). On the other hand, the OH effect is weaker for (lower status) women (Lorenzi-Cioldi, 1998), but this effect would be opposed here because women were in a large (‘dominant’) majority. Our own research with student participants has, however, found no evidence of an OH effect for female students, even when they comprise a very large majority (i.e., female students taking a college major dominated by female students; Hewstone et al., 2007). In the light of these considerations, we did not advance directional hypotheses for our first study.

Method

Participants and design

Participants were 103 nursing students (median age = 22 yrs.); the majority comprised 93 females and the minority 10 males¹. The design was a 2 (participant gender: females/males) x 2 (target group: ingroup/outgroup) mixed quasi-experimental design with repeated measures on the second factor.

Procedure

We sent questionnaires to a university department of nursing, where instructors asked students to complete a short ‘Departmental Survey’ at the end of a lecture. Participants were

assured that their responses were confidential and anonymous, which the instructor reinforced by asking them to place their questionnaire in an envelope and leave it at a specified collection point. The survey took approximately 10 minutes to complete. The measures were ordered as below.

Perceived dispersion. We assessed perceived variability using the range measure (Jones et al., 1981), which assessed the ‘perceived dispersion’ component of variability (and not ‘stereotypicality’, see Park & Judd, 1990). It is simple to administer, and has been identified as one of the most robust measures of perceived variability (Park & Judd, 1990; Ostrom & Sedikides, 1992). Participants rated the variability of gender in- and outgroups on six dimensions relevant to the general stereotype of nurses -- *caring, communication skills, confident, responsible, physically strong, and thoughtful* (see Brown & Wooton-Millward, 1993; Floge & Merrill, 1986; van Knippenberg & van Oers, 1984). We averaged ratings of ingroup and outgroup across the six dimensions to yield indices of ingroup and outgroup variability (Cronbach’s alphas = .819 and .857, respectively). To anchor their judgments, participants first marked with a ‘X’ on each of six 100-mm scales where on average they thought members of the target group in their department fell. We then asked participants to go back to each scale and mark where the most extreme target group members would fall, by making two vertical slashes on each line; the difference between the rated extremes (full range) was the measure of perceived dispersion for the target group. The next page of the questionnaire asked respondents to make similar ratings for the other target group².

Visibility. Three items assessed visibility (how ‘noticeable’, ‘distinctive’, and ‘self-conscious’ respondents felt in their department; 1, ‘not at all’; 7, ‘very’). We averaged ratings across the first three items to form a scale (alpha = .630).

Familiarity. Respondents indicated how familiar they were with other women and men students, separately, in their year of the course by answering the following questions (based on Linville et al., 1989, 1996): ‘Approximately how many [female/male] students would you

consider *acquaintances* of yours?'; 'Approximately how many [female/male] students do you *know well*?'; 'How familiar are you with other [female/male] students?' (1, 'not at all', 7, 'very'). We averaged standardized responses for ingroup and outgroup targets across the three questions to yield indices of ingroup and outgroup familiarity (alphas = .520 and .681, respectively).

Perceived status. Respondents rated the perceived *status* of female and male nurses on their course, on 7-point scales (1, 'low status'; 7, 'high status').

Perceived group size. Finally, respondents indicated what proportions (as percentages summing to 100) of nursing students in their year were women and men.

Results and Discussion

Overview

Unless reported otherwise, we analyzed the data using a 2 (gender: females vs. males) x 2 (target group: ingroup vs. outgroup) mixed model Analysis of Variance (ANOVA) with repeated measures on the second factor. Evidence of perceived outgroup or ingroup homogeneity effects is found in a significant participant gender by target group interaction. To improve readability of this article, when reporting simple main effects for the measure of perceived dispersion, and all measures that included a target-group repeated measure, we focus on the ingroup vs. outgroup comparisons for each participant gender group. The means for the main dependent measures are shown in Table 1.

Perceived group size

We computed a 2 (participant gender) x 2 (target group gender) ANOVA with repeated measures on the second factor on the perceived percentage of female and male nurses. The only effect was a main effect of target gender, $F(1, 101) = 1945.96, p < .0005$; all participants were aware that women ($M = 88.84$) heavily outnumbered men ($M = 11.18$).

Perceived dispersion

The ANOVA yielded only a significant gender by target group interaction, $F(1, 101) = 13.96, p < .0005$. Simple main effects revealed that the majority females rated the ingroup ($M = 55.53$) more variable than the outgroup ($M = 46.14$), $F(1, 101) = 45.47, p < .0005$, whereas the minority males rated the outgroup more variable ($M = 60.29$) than the ingroup ($M = 52.98$), $F(1, 101) = 2.96, p = .088$. Thus, women in the majority demonstrated an OH effect, whereas men in the minority displayed an IH effect. These findings suggest that group size (majority vs. minority) rather than gender is responsible for these effects.

Visibility

A t-test revealed that minority male nurses felt more distinct ($M = 4.63$) than majority female nurses ($M = 3.79$), $t(101) = -2.12, p = .036$. This result is consistent with theoretical positions which argue that members of minorities feel more distinctive than members of majorities (Kanter, 1977a, b; Simon, 1992), and inconsistent with the claim that group proportions do not affect men (Sackett et al., 1991).

Familiarity

The ANOVA yielded a significant gender main effect $F(1, 101) = 10.62, p = .002$, and a significant target effect, $F(1, 101) = 51.07, p < .0005$, which were both qualified by a significant gender by target group interaction, $F(1, 101) = 78.64, p < .0005$. Since this is a composite score made up of three standardized responses, we report these standardized mean scores here but reference to the unstandardized means in Table 1 provides a clearer picture of how participants' responses varied over conditions. Analysis of simple main effects revealed that majority female nurses rated the ingroup ($M = .03$) more familiar than the outgroup ($M = -.15$), $F(1, 101) = 11.06, p = .001$, whereas the minority male nurses rated the outgroup more familiar ($M = 1.44$) than the ingroup ($M = -.29$), $F(1, 101) = 17.06, p = .004$. These findings make good sense, as one would expect an attenuation of the relative ingroup familiarity effect when the outgroup was proportionally much larger than the ingroup. Overall, the pattern of these results is very similar to that found for perceived group variability.

Perceived status

The ANOVA yielded no significant effects. Thus there was no evidence that either gender or group size moderated status.

Mediation analysis

We used the multiple regression mediation approach (e.g., Baron & Kenny, 1986) to test whether the effect of the predictor (effects coding, female majority +1 vs. male minority -1) on outgroup homogeneity reduces when we control for potential mediators. For this analysis, we created difference scores (ingroup minus outgroup) for the dependent variable (outgroup homogeneity) and three of the potential mediators (familiarity, status, and perceived group size); the third mediator was visibility, and scores for all variables were standardized. The predictor affected both familiarity ($\beta = .66, p < .0005$) and visibility ($\beta = -.21, p = .036$), but neither status ($\beta = .02, p = .84$), nor perceived group size ($\beta = .04, p = .68$). The predictor also affected the dependent variable ($\beta = .35, p < .0005$). However, neither familiarity ($\beta = -.16, p = .20$), status ($\beta = .14, p = .14$), perceived group size ($\beta = .07, p = .45$), nor visibility ($\beta = -.06, p = .54$), predicted outgroup homogeneity whilst controlling for the predictor.

To summarize, there was an OH effect for the majority, female nurses, but an IH effect for the token minority, male nurses. Interestingly, our measures of relative group familiarity revealed the same pattern of results as we found for variability. Female nurses in the majority showed a relative ingroup familiarity effect, whereas minority male nurses showed a relative outgroup familiarity effect. As expected, the minority male nurses also felt more distinctive than the majority group (Kanter, 1977a, b; Simon, 1992), but there were no differences in the perceived status of the majority and minority groups. Despite the parallel findings for perceived variability and familiarity, there was no evidence that either familiarity or any of the other potential mediators could account for the effect of group size on perceived group variability. To address the confound between group size and gender (in both Study 1 and Brown & Smith,

1989), we conducted a conceptual replication and extension of this study in a setting where majority-minority relations for the gender groups were reversed.

Study 2

In our second study we sought an occupational context in which men would be in a large majority and women in a small minority, in order to identify whether our effects were due to gender or to majority/minority status. We chose the police force in the U.K., where women are distinctly underrepresented, accounting for only 12 per cent of police officers nationally. We were able to survey police officers on a training course, on which policewomen typically accounted for approximately one third of the places, and policemen two thirds. These group proportions exemplify a male-tilted setting (see Allmendinger & Hackman's, 1995, criteria), so that the policewomen in this context do not constitute 'tokens', but rather a 'minority', and find themselves in a less extreme sex ratio than the male nurses in Study 1.

Previous research on Kanter's (1977a, b) theory has reported that policewomen do suffer in some of the ways Kanter predicted, especially in male-skewed settings. They report being the target of stereotyping and discrimination, being perceived as physically weak, and being seen to lack leadership qualities (Martin, 1980; Ott, 1989). These findings suggest that minority policewomen, despite being in a less extreme sex ratio than the male nurses in Study 1, would be likely to feel more distinctive than majority policemen (Kanter, 1977a, b).

We made separate predictions regarding perceived variability for majority policemen and minority policewomen. For higher-status policemen, we predicted an OH effect (Lorenzi-Cioldi, 1998), which should be exaggerated because they are in a majority (Brewer, 1993; Brown & Smith, 1989; Simon, 1992). For policemen, the effects of gender, status and group size all 'pull' in the same direction, towards an OH effect. For lower-status policewomen, however, we predicted an IH effect. Although the IH effect is weaker than the OH effect (Voci, 2000), for policewomen gender, status and group size all 'pull' in the direction of perceived ingroup homogeneity (Lorenzi-Cioldi, 1998; Simon, 1992). These hypotheses are consistent with Kanter's

theorizing. According to Kanter, majority policemen should see the minority group as distinct, polarize the subgroups of policewomen and policemen, and assimilate minority women to the stereotype. Minority policewomen, on the other hand, should feel more distinctive as a subgroup and, because they are likely to be stigmatized and feel more discomfort and dissatisfaction, are likely to emphasize ingroup cohesiveness and intra-group similarity (Simon, 1992).

Method

Participants and design

Participants were 62 ‘probationer’ police officers attending a regional training course (median age = 26 yrs); the majority comprised 50 policemen and the minority 12 policewomen. The design was a 2 (participant gender: females vs. males) x 2 (target group: ingroup vs. outgroup) mixed quasi-experimental design with repeated measures on the second factor. For each participant, we paid £2 to a charity fund chosen by the police officers.

Procedure

We sent questionnaires to a police training centre, where instructors asked participants to complete a short ‘Survey of Professional Groups’, following the same procedure, and including the same measures, as for Study 1, with the following minor alterations to dependent measures.

Perceived dispersion. Participants completed the range measure separately for policemen and policewomen on the course, and made ratings on six trait dimensions relevant to the police stereotype (see Hopkins, Hewstone & Hantzi, 1992; Tuouhy & Wrennall, 1995). The dimensions were: *Helpful*, *Trustworthy*, *Friendly*, *Aggressive*, *Rude*, and *Strict*. We averaged ratings of ingroup and outgroup across the six dimensions to yield indices of ingroup and outgroup variability (Cronbach’s alphas = .806 and .828, respectively).

Other dependent measures. We used the same measures of visibility, familiarity, status, and perceived group size as in Study 1. We averaged ratings across the three items to yield an index for visibility (alpha = .548), and we averaged standardized responses for ingroup and outgroup

targets across the three familiarity questions to yield indices of ingroup and outgroup familiarity (alphas = .387 and .637, respectively)³.

Results and discussion

Overview

Unless reported otherwise, we analyzed the data using a 2 (gender: females vs. males) x 2 (target group: ingroup vs. outgroup) mixed model ANOVA with repeated measures on the second factor. In reporting the results for perceived dispersion and all measures that included a target-group repeated measure, we focus on the ingroup vs. outgroup comparisons for each participant gender group. The means for the main dependent measures are shown in Table 2.

Perceived group size

We computed a 2 (participant gender) x 2 (target group gender) ANOVA with repeated measures on the second factor on the perceived percentage of policemen and policewomen on the training course. The only effect was a main effect of target gender, $F(1, 60) = 716.18, p < .0005$. All participants were aware that policemen ($M = 76.44$) outnumbered policewomen ($M = 23.55$).

Perceived dispersion

The ANOVA yielded only a significant gender by target group interaction, $F(1, 60) = 10.12, p = .0023$. Analysis of simple main effects revealed that the majority policemen rated the ingroup ($M = 46.65$) more variable than the outgroup ($M = 41.45$), $F(1, 60) = 6.49, p = .013$, whereas the minority policewomen rated the outgroup more variable ($M = 48.71$) than the ingroup ($M = 39.51$), $F(1, 60) = 5.26, p = .025$. These results replicate the OH effect for the majority and the IH effect for the minority found in Study 1.

Visibility

There were no significant effects: minority policewomen did not feel more visible than majority policemen.

Familiarity

The ANOVA on the composite measure of familiarity yielded a main effect only for target, $F(1, 60) = 64.80, p < .0005$, which was qualified by a significant gender by target group interaction, $F(1, 60) = 67.90, p < .0005$. Analysis of simple main effects revealed that majority policemen were more familiar with the ingroup ($M = .13$) than the outgroup ($M = -.19$), $F(1, 60) = 13.16, p = .001$, whereas minority policewomen were more familiar with the outgroup ($M = .77$) than the ingroup ($M = -.54$), $F(1, 60) = 54.92, p < .0005$.

Perceived status

The ANOVA yielded only a significant gender by target group interaction, $F(1, 60) = 7.31, p = .0089$. Analysis of simple main effects revealed only that policemen felt the ingroup had higher status ($M = 5.24$) than the outgroup ($M = 4.36$), $F(1, 60) = 6.98, p = .011$.

Mediation analysis

We computed the same mediational analysis as for Study 1 to test whether the effect of the predictor (effects coding: male majority +1 vs. female minority -1) on outgroup homogeneity reduces when we control for potential mediators (ingroup minus outgroup differences for familiarity, status and perceived group size; and ratings of visibility). The predictor affected two potential mediators, familiarity ($\beta = .73, p < .0005$) and status ($\beta = .33, p = .009$), but not visibility ($\beta = .01, p = .94$) or perceived group size ($\beta = .006, p = .97$). The predictor also affected the dependent variable ($\beta = .38, p = .002$). However, neither familiarity ($\beta = .00042, p = .99$), status ($\beta = -.01, p = .93$), visibility ($\beta = .21, p = .10$), nor perceived group size ($\beta = .09, p = .50$), predicted outgroup homogeneity whilst controlling for the predictor.

Overall, the findings from Study 2 replicate and build on those from Study 1. With an alternative occupational group, where majority and minority status is reversed in comparison to the groups used in Study 1, we again found outgroup and ingroup homogeneity effects for majority and minority groups respectively. We also replicated the parallel pattern of results for both perceived variability and familiarity, but again found no evidence that either familiarity or any of the other potential mediators could account for the differences in perceived variability.

General discussion

The results across our two studies show that group size moderates perceived group variability for these occupational groups with different sex ratios, giving some support to each of the main theoretical perspectives considered (Kanter, 1977a, b; Simon, 1992). The occurrence of an OH effect for the majorities and an IH effect for the minorities replicated demonstrates that it is group size, specifically being in a majority or a minority, that moderates perceived dispersion here, rather than either gender or status accounting for these effects.

Our finding of an OH effect for majorities is consistent with several theorists (Brewer, 1993; Lorenzi-Cioldi, 1998; Simon, 1992, 1998; Simon & Brown, 1987), but the fact that this effect reversed, to an IH effect, for both minorities -- male nurses and policewomen -- is powerful testimony to the impact of group size, and shows that group proportions can affect men and not just women (see Sackett et al., 1991). But we did not find evidence that status underlay these effects of group size. Both Simon (1992) and Lorenzi-Cioldi (1998) argue that ingroup majority and minority size imply high and low status, respectively, which increases category salience for members of the minority (e.g., Simon & Hamilton, 1994), and leads to perceived ingroup homogeneity. In Study 1 there were no effects on perceived status, and in Study 2 although majority policemen did rate ingroup status higher than outgroup status, there was no evidence that minority policewomen saw status relations in the same way.

Rather than status, it appears to be group proportions that have a direct impact on perceived dispersion. This argument is strengthened by evidence from related research. Studying majority male and minority female academics in different group proportions, we found an OH effect for majority group members and an IH effect for minority group members. We also found that men's OH effect was accentuated when they were a 'skewed' rather merely a 'tilted' majority, whereas women's IH effect was accentuated when they were 'tokens' rather than simply a minority (Hewstone et al., 2006, Study 1). Moreover, we found that relative ingroup dispersion varied as a linear function of group proportions (Hewstone et al., 2006, Study 2).

Perceived outgroup homogeneity for men decreased steeply from male-skewed departments, and was minimal in balanced and female-tilted departments; whereas perceived ingroup homogeneity for women decreased steeply from male-skewed departments, and the means were in the direction of outgroup homogeneity in female-tilted departments. Thus perceived dispersion (which we have argued provides an index of assimilation) is a measure that is quite sensitive to differences in group proportions and should, therefore, be included in future studies testing Kanter's (1977a, b) theory.

In the present research, because we found an OH effect for men and women when they were in the majority, and an IH effect for each gender group in the minority, our results emphasize group size rather than gender as a moderator of perceived variability. Lorenzi-Cioldi and others (1993, 1998; Lorenzi-Cioldi et al., 1995; Young et al., 1999) may still be right that, in general, men tend to show a stronger OH effect than women (indeed, results of our own research with student groups in different numerical settings tend to support this position; see Hewstone et al., 2007). However, we are not convinced that gender differences in perceived variability are general and pervasive, nor that they can be explained in terms of status. Rather, we see gender effects as tendencies that, quite reasonably, vary as a function of the social context, including factors such as whether the ingroup is a numerical majority or minority.

Contrary to Kanter's (1977a, b) theory, we found no evidence that minority women felt especially 'visible'. However, consistent with Kanter's emphasis on group proportions, what evidence there was for visibility occurred in Study 1 where the small minority of token male nurses in Study 1 reported being more visible than did members of the skewed majority of female nurses. In Study 2 where policewomen were in a larger minority, they did not report feeling more visible. The relative weakness of effects on visibility, in comparison with effects on perceived dispersion, and the results of mediational analyses, rule out an explanation of homogeneity effects in terms of visibility. Kanter's (1977a, b) theory, in fact, should not lead us to expect any such effect. She merely proposes that visibility and assimilation (of which, we have

suggested, perceived variability is an index) are both important ‘perceptual phenomena’ in settings of unequal group proportions, and she does not claim that the former drives the latter.

Our research also investigated familiarity as a potential mediator of outgroup homogeneity effects, and we noted that a good case could be made for both group size and gender effects on perceived variability being mediated by relative ingroup familiarity. Consistent with this argument, in both studies we found that only members of the numerical majority showed a relative ingroup familiarity effect, but members of the minority showed a relative *outgroup* familiarity effect. This pattern of responses makes sense in the light of the group proportions. However, we could find no evidence that familiarity mediated perceived dispersion.

One advantage of conducting two studies of gender groups in different group proportions, as we have done, is that it helps to rule out an alternative explanation for OH and IH effects. As we noted earlier, Brown and Smith (1989) were limited by the fact that they could only study women (academics) as a numerical minority, one with lower status than men in the same setting. In the present research, by studying two majorities (female nurses and policemen) and two minorities (male nurses and policewomen), we can conclude that within these occupational groups members of the majority gender group show an OH effect, but members of the minority gender group show an IH effect. Thus the effect appears due to majority status or group size. It still remains true, of course, as noted earlier, that 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 & Judd, 1993). Moreover, Brauer (2001) pointed out that differences in perceived variability can, in principle, reflect a main effect of target group (e.g., female nurses and policemen are, actually, more variable groups). But in the present case, at least, we have shown that effects are not simply due to perceived group size, because that is not correlated with perceived group variability. Furthermore, because the members of both occupational groups tested were all trainees, there were no real differences between men and women within each

group, which would have been the likely source of any actual differences in variability (see Fiske, 1993; Guinote, 2004).

The reported studies show that perceived group variability varies systematically as a function of group size. We can conclude that the results are due to group size rather than gender, and they appear to be direct effects of group proportions rather than mediated by visibility, status or familiarity.

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Table 1
Mean Ratings as a Function of Gender (Group Size) (Study 1)

Measure	Participant Gender			
	Female nurses (majority)		Male nurses (minority)	
	Ingroup	Outgroup	Ingroup	Outgroup
Perceived dispersion	55.53	46.14	52.98	60.29
Familiarity				
Acquaintances	28.70	5.83	17.25	32.29
Know well	10.30	2.36	8.60	11.50
Global	5.12	3.80	5.00	4.90
Composite ^a	.031	-.154	-.286	1.44
Perceived status	5.07	4.89	4.80	4.70
Visibility	3.79		4.63	

^a Standardized score

Table 2
Mean Ratings as a Function of Gender (Group Size) (Study 2)

Measure	Participant Gender			
	Policemen (majority)		Policewomen (minority)	
	Ingroup	Outgroup	Ingroup	Outgroup
Perceived dispersion	46.65	41.45	39.51	48.71
Familiarity				
Acquaintances	21.92	9.74	7.42	20.58
Know well	10.73	3.75	5.04	13.79
Global	5.07	.36	4.83	4.92
Composite ^a	.129	-.186	-.536	.774
Perceived status	5.24	4.80	4.42	5.00
Visibility		3.91		3.89

^a Standardized score

Footnotes

¹ The relative proportions of students in our survey (90.3% females, 9.7% males) are close to the figures for the training course as a whole (227 females, 88%; 31 males, 12%), and the nursing profession nationally (91% females, 9% males). Kanter's (1977a, b) criteria for skewed and tilted groups are, in fact, rather vague, but according to Allmendinger and Hackman's (1995) criteria (skewed: 1-11% minority members; tilted: 24-47% minority members), this represents a female-skewed setting, in which men are a token minority. Relatedly, Gross and Miller (1997) have argued that the 'Golden Section' (61.8% majority; 38.2% minority) may reflect the point at which, subjectively, majority size is recognized. The range of majority sizes in our studies clearly satisfies this criterion.

² The mean ratings on these scales can be used as measures of group evaluation, which we will not discuss in detail, since our focus is on perceived group variability. In Study 1 we were unable to form a reliable index from these scales; in Study 2, we found that only women evaluated the ingroup more positively than the outgroup, an effect that has been reported previously (e.g., Brown & Smith, 1989; Lorenzi-Cioldi, 1998), and may reflect social desirability concerns on the part of men.

³ Because the alpha for ingroup familiarity was quite low, we also computed three separate analyses; since these analyses showed exactly the same pattern of results, we proceeded to collapse them, as for outgroup familiarity.