Running Head: MULTIPLE CATEGORIZATION

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Abstract

Two experiments explored whether crossing social category memberships can reduce intergroup bias. Experiment 1 provided a precise comparison between discrimination against single out-groups, 'partial' out-groups, and double out-groups. Intergroup bias and perceived intergroup similarity followed an additive pattern such that partial out-groups were discriminated against as much as single out-groups, whilst both were discriminated against to a lesser extent than double out-groups. In Experiment 2 a more realistic form of crossing was employed whereby five additional dimensions of categorization were considered by participants instead of the traditional two. In line with a decategorization perspective, intergroup bias was reduced in both multiple group conditions relative to the single categorization (baseline) condition. Participants perceived a weakened intergroup structure and displayed a greater tendency to see out-group members as individuals in multiple group conditions, however, only perceived intergroup structure mediated the pattern of intergroup bias. The implications of these findings for conceptualizations of crossed categorization are discussed.

Does multiple categorization reduce intergroup bias?

Recently there has been a discernible increase in social psychologists' interest in multiple categorization phenomena. Rather than studying ingroup versus outgroup relations in simple (two group) contexts, there is an increasing awareness that we can all be categorized in terms of a number of different intergroup criteria. Furthermore, these multiple identities may become salient at the same time. Previous work has established that in such situations we may expect unique effects of these category combinations on intergroup phenomena such as stereotyping and prejudice (e.g., Brewer, Ho, Lee, & Miller, 1987; Crisp & Hewstone, 1999a; Ensari & Miller, 1998; Miller, Urban, & Vanman, 1998; Smith, Fazio, & Cejka, 1996; Urban & Miller, 1998; Vanbeselaere, 1991).

Much of the recent research utilizes the crossed categorization paradigm (Deschamps & Doise, 1978). In this situation two orthogonal dimensions of categorization are crossed to form four new 'crossed category' groups. Take, for example, gender and age; instead of considering only females vs. males or young vs. elderly, in crossed categorization situations perceivers attend to both of these dimensions and respond to composite groups such as young-females, young-males, elderly-females, and elderly-males. In terms of in-group/out-group relations we have four groups that are similar and different from the perceiver in distinct ways. If our perceiver is a young-female then other young-females are double in-group members (sharing group membership with the perceiver on both dimensions of categorization), young-males and elderly-females are partial group members (being partially in-group and partially out-group), and elderly-males are double out-group members (being different from the perceiver on both dimensions of categorization).

There is now an increasing body of psychological literature concerning the effects associated with crossing categorizations. Research ranging from the distinctly non-social (Crisp & Hewstone, 1999b; Deschamps, 1977), through the quasi-social minimal group paradigm (Brown & Turner, 1979; Diehl, 1990; Eurich-Fulcher & Schofield, 1995; Marcus-Newhall, Miller, Holtz, & Brewer, 1993; Vanbeselaere, 1987, 1991, 1996), to work with real social groups (Brewer et al., 1987; Hagendoorn & Henke, 1991; Hewstone, Islam, & Judd, 1993; Rehm, Lilli, & Van Eimeren, 1988; Singh, Yeoh, Lim, & Lim, 1997) has attempted to delineate the effects of multiple group membership. Such multiple systems of categorization are important to social psychologists not just because they constitute a realistic reflection of intergroup relations, but also because of the potential they offer for reducing prejudice and discrimination.

The idea that crossing social categories may work to reduce intergroup conflict arose initially from observations made by anthropologists studying tribal societies (Evans-Pritchard, 1940; Murphy, 1957; see also LeVine & Campbell, 1972) who found reduced conflict in cultures with a crossed societal structure (i.e., where group memberships were shared as well as non-shared) compared with those without. However, previous research exploring the bias-reducing effects of crossed categorization has provided a far from conclusive answer to the question of whether crossed categorization, at a psychological level, can reduce intergroup bias.

In a recent review, Crisp and Hewstone (1999a) compiled evidence of studies that have addressed the issue of whether intergroup bias is lower against multiply categorized targets than against targets characterized by just one out-group categorization. They found as much evidence for a reduction in discrimination as for no difference, or even an increase in discrimination (studies supporting the former: Deschamps & Doise, 1978; Vanbeselaere, 1987, 1991, 1996; studies supporting the latter: Brown & Turner, 1979; Singh et al., 1997; Vanbeselaere, 1996). Crisp and Hewstone pointed out that the lack of clarity on this issue may well be due to the fact that most of the relevant studies were open to serious criticism in

some way or another. Both Deschamps and Doise (1978) and Vanbeselaere (1987) pooled partial and double out-group conditions into one overall 'crossed' condition. Vanbeselaere (1996) included no double out-group condition. Brown & Turner (1978) and Singh et al. (1997; study 1) were unable to establish baseline discrimination in the simple categorization condition. Finally, Vanbeselaere (1991) did not compare statistically between simple and partial groups. All of the above problems preclude a precise test of the hypothesis that crossed categorization can reduce intergroup bias. The aim of the present research was to address these problems and offer alternatives to the traditional model for testing crossed category effects.

The idea that crossing categories can reduce intergroup bias has been tested almost exclusively using the minimal group paradigm (for an exception see Singh et al., 1997). This experimental paradigm is valuable because it creates categorizations of equal salience and avoids confounding real world influences (Tajfel, Flament, Billig, & Bundy, 1971). Thus, our refined test of the discrimination-reducing qualities of crossed categorization will utilize the minimal group paradigm. Two additional conditions must be satisfied. The first condition is the need to include a simple categorization condition and to replicate the base-line minimal group paradigm finding of in-group favouritism. The key to assessing whether intergroup bias is reduced under conditions of crossed, relative to simple, categorization lies in comparing the difference between discrimination displayed against the partial group relative to the simple group. Brown and Turner (1979) did include a simple condition but did not obtain intergroup bias in this baseline condition. The same problem was encountered by Singh et al. (1997; Study 1). Diehl (1990) obtained no discrimination against the partial group but this was only relative to the double out-group; a simple categorization condition was not included.

The second condition is that a statistical distinction between partial and double out-groups must be made; it is not adequate to pool all of the crossed groups into one condition (otherwise important differences between crossed groups might be missed; Deschamps & Doise, 1978; Vanbeselaere, 1987). Other tests have included no double out-group condition (Vanbeselaere, 1996). Since partial and double out-groups are conceptually distinct, both should be compared with the simple categorization.

Finally, if crossed categorization can have important effects on the level of intergroup bias observed, it becomes important to be able to specify the psychological processes that drive the effects. Previous work has specified both cognitive (Deschamps & Doise, 1978) as well as motivational (Brown & Turner, 1979) explanations of the effect. Since a purely cognitive category differentiation process (Doise's, 1976; Tajfel, 1959; Tajfel & Wilkes, 1963) cannot explain the in-group favouring direction of bias, and the more motivational social identity theory postulates a prerequisite cognitive differentiation process (Tajfel & Turner, 1979), it is not prudent to treat such theoretical stances as mutually exclusive (for a recent discussion of these issues as they relate to crossed categorization see Crisp & Hewstone, 1999a; in press-a). Thus, in Experiment 1 we explored both potential cognitive and motivational mediators of the effects of crossed categorization on intergroup bias.

Experiment 1

The aim of Experiment 1 was to satisfy the above conditions necessary for a complete test of the bias-reduction hypothesis (i.e., including all necessary comparison groups: simple, partial, and double out-group; and attaining baseline discrimination in the simple condition). This first experiment also explored the possible 'carry-over' effects of crossed categorization. None of the previous research in this area has addressed whether crossing social categories leads to any subsequent effects on evaluations of groups when the crossed categorizations are devolved into their simple group constituents (e.g., whether prior partial group membership -

a young male perceiving a young female - has effects on intergroup bias when only one of the dimensions are salient - male vs. female).

Several studies have found that category differentiation has a role to play in explaining crossed category effects (e.g., Crisp & Hewstone, 1999b; Deschamps, 1977; Marcus-Newhall et al., 1993; Vanbeselaere, 1991). Thus, a measure of participants' cognitive representation of the intergroup context was included in the form of an item measuring intergroup similarity. In addition to this cognitive prerequisite for intergroup bias, social identity theory (Tajfel & Turner, 1979) also postulates that intergroup discrimination is motivated by the desire for a positive social identity and Brown and Turner (1979) suggest that such motivational processes can also explain crossed categorization effects. To explore this possibility, a scale measuring participants' feelings of social identification was also included. For both measures we would predict a pattern across the three conditions that corresponds to the pattern found for intergroup bias, and that, furthermore, participants' responses on these measures would mediate intergroup bias.

Method

Participants and design. Fifty school pupils (36 males, 14 females, aged between 16 and 18 years) were randomly assigned to the three cells of a 3 (categorization condition: simple/partial/double out-group) x 2 (target group: in-group/out-group) mixed design with repeated measures on the second factor. The school was paid £1 per pupil for its participation.

Procedure. Participants were told that they were going to take part in an experiment concerned with how people make decisions when they have only a limited amount of information available to them. Group memberships were allocated in an explicitly random fashion using the method devised by Locksley, Ortiz, and Hepburn (1980). In the simple condition the experimenter had one bag from which each participant was required to select one counter. The counters all had the letter 'A' on them in red ink, but participants were led to believe that there were an equal number of 'A' and 'B' counters in the bag. In order to confirm this illusion, the experimenters took pains to ostensibly check the participants' group label before giving them 'their group's' questionnaire throughout the experiment. In the simple condition, since all participants were in group 'A', this was the in-group and group 'B' was the out-group. In the partial and double out-group conditions participants were presented with two bags and required to select a counter from each. They were told that one bag contained equal numbers of 'A' and 'B' counters and the other bag contained equal numbers of 'X' and 'Y' counters. In reality there were only 'A' counters in one bag and 'X' counters in the other. From this point on the experimental procedures for the three conditions were identical except that different target groups were used in each condition. Thus, in both the partial and double out-group conditions the double in-group was group 'AX' since all participants were in this group. In the partial condition the targets were 'BX' group members, and for the double out-group condition the targets were 'BY' group members.

Following Vanbeselaere (1987, 1991), a number of procedures were followed to ensure that the categorizations remained salient to the participant and that they would not become confused by the complexity of the situation. Firstly, the group labels on the questionnaires were always written in different coloured inks (e.g., 'A' was written in red ink, 'B' was written in blue ink, 'X' was written in black ink, and 'Y' was written in green ink). Secondly, in order to increase the salience of the participants' own group they were required to write their group label at the top of every questionnaire. In addition, overhead projectors clearly showed the group situation, with the different group labels in different colours in order to clarify the intergroup situation for participants. For additional clarity, directly after being categorized, the participants were also required to write down the two (simple condition) or

four (partial and double out-group conditions) groups participating and to place a tick beside their own group.

Dependent measures. A intergroup similarity questionnaire was distributed which required participants to circle on a seven-point scale, "How similar or different you feel your group is to the other group?" (e.g., simple out-group condition: "A and B are very different from one other", 1; "A and B are very similar to one another", 7; partial group condition: "AX and BX are very different from one other", 1; "AX and BX are very similar to one another", 7; and double out-group condition: "AX and BY are very different from one other", 1; "AX and BY are very similar to one another", 7).

Standard Tajfel intergroup matrices were then distributed. The matrices used were similar to those used by Allen and Wilder (1975) but were doubled such that participants completed a booklet of 16 (2 x 8) matrices (i.e., four different types of matrix, each presented twice, varying whether the in-group or out-group was in the upper/lower row of the matrix)[1]. Participants were instructed to distribute the symbolic points on the matrices to each person and to think of the task as a 'game'.

After the matrices were completed, a social identity scale was distributed. These items were intended to measure how positive or negative participants' social identity felt with regard to the ad hoc groups created in the experiment (Gagnon & Bourhis; 1996; Perreault & Bourhis, 1999) and therefore constituted a test of social identity theory's explanation of crossed categorization effects. The scale was loosely based on the scale used by Heatherton and Polivy (1991) and consisted of ten items that were designed to tap participants' immediate evaluations of their in-group ("I feel good about my group at the moment", "I feel concerned about how my group did on the last questionnaire", "I feel that my group is as good as the other groups taking part in this experiment", "I feel confident that my group will perform well during the experiment", "I feel displeased with my group at the moment", "I feel worried about what other people think of my group", "I feel that my group deserved a lot of points on the last questionnaire", "I feel bad about being in my group at the moment", "I feel that my group is inferior to the other groups in this experiment", and "I feel that my group is doing well at the moment"). Participants were asked to indicate how much each statement described their current feelings on a five-point scale ("not at all", 1; "extremely", 5). The scale had fair internal reliability with a Cronbach's alpha of .60.

Finally, participants in all conditions completed simple group evaluations to test carry over effects of crossed categorization. This involved the question, "How do you view group ___?" for both groups 'A' and 'B' ("negative", 1; "positive", 7).

Results

Overview. The data from the Tajfel matrices were analyzed as points allocations (to test the hypothesis that discrimination would be reduced in crossed categorization situations, cf. Diehl, 1990). There were no significant effects involving participant gender. Means and standard deviations for all measures are shown in Table 1.

---Insert Table 1 about here---

Intergroup bias. A 3 (categorization: simple/partial/double out-group) x 2 (target: in-group/out-group) Analysis of Variance (ANOVA) with repeated measures on the second factor revealed a main effect of target, F (1, 47) = 36.03, $p < .0005$ (overall the in-group, M = 220.81, received more points than the out-group, M = 160.15). However, this effect was qualified by a categorization x target interaction, F (2, 47) = 3.64, p = .034. Analysis of simple main effects revealed that in all three conditions there was significant intergroup bias (simple, F (1, 47) = 6.38, p = .015; partial, F (1, 47) = 4.99, p = .030; double out-group, F (1, 47) = 31.05, $p < .0005$). Furthermore, there were also differences across the three conditions for in-group allocations, F (2, 47) = 4.37, p = .018; More points were given to members of the

(double) in-group when also rating members of the double out-group (M = 244.31) than when also rating partial group members (M = 207.59), or simple out-group members (M = 210.53), and there was no difference between these two latter conditions (Newman-Keuls, all p's < .05). For out-group allocations simple main effects revealed that the differences across the three conditions only approached significance, F (2, 47) = 2.50, p = .09 (i.e., there was no difference in the allocations of points to simple, partial, or double out-groups; Newman-Keuls, p < .05). In addition, when an index of intergroup bias was formed (in-group minus out-group allocations), members of simple out-groups and partial groups did not differ (M = 43.76 and M = 38.71), however, more bias was displayed towards double out-group members than either of these groups (M = 99.50; Newman-Keuls, p < .05). To summarize there was no significant difference in the discrimination directed against the simple out-group and the partial out-group, and strongest bias was directed against the double out-group[2].

Intergroup similarity. A one-way ANOVA on ratings of perceived intergroup similarity revealed a significant difference between the three conditions, F (2, 47) = 5.39, p = .0078. Post hoc analysis revealed that participants rated the double out-group significantly less similar to the in-group ($M_{double\ out\text{-}group}$ = 2.88) than they did the other two groups (M_{simple} = 4.53; $M_{partial}$ = 4.88; Newman-Keuls, p < .05) which did not differ from each other. These results from the similarity measure indicate that our measure of category differentiation followed the same pattern as intergroup bias.

Social identification. A one-way ANOVA performed on the social identity scale revealed no significant differences between the three category conditions, F (2, 47) = .076, p = .927. Participants' perceived social identification with the ad hoc groups was low (M = 34.9), and not affected by crossing categories.

Simple group evaluations. Finally, we analyzed evaluations of the decomposed simple in-group and out-group (i.e., ratings of the single category in-group and out-group). A 3 (categorization: simple/partial/double out-group) x 2 (target: group A/group B) mixed-design ANOVA with repeated measures on the second factor revealed only a significant main effect for target, with group A (the in-group) evaluated more positively (M = 5.24) than group B (the out-group; M = 3.92), F (1, 47) = 16.04, p < .001. Thus crossed categorization does not appear to influence evaluations after the composite groups are devolved to their initial constituent simple group classifications.

Mediational analysis. To investigate the possibility that perceived intergroup similarity could explain the effects of crossed categorization on discrimination, we computed a mediational analysis (Baron & Kenny, 1986; Judd & Kenny, 1981). The predictor was a contrast code that reflected the pattern of bias across the three categorization conditions (simple, -1; partial, -1; double out-group, +2), intergroup similarity was the mediator and intergroup bias (in-group minus out-group allocations) was the dependent variable. The predictor (categorization) was significantly related to both intergroup bias (β = .365, p = .009) and the similarity measure (β = -.426, p = .002): The pattern of bias (as a function of categorization condition) was reflected in the pattern of perceived intergroup similarity. The third step, where the we test for a direct effect of the mediator on the outcome measure, revealed that intergroup similarity (controlling for categorization condition) did not predict intergroup bias (β = .046, p = .760). Thus the effect of categorization condition on intergroup bias was not mediated by intergroup similarity.

Discussion

The aim of this first experiment was to clarify the effects of crossed categorization by providing a methodologically and conceptually refined test of the hypothesis that crossing categories could reduce intergroup bias. Whilst findings from the social identification scale suggest that participants did not identify with the minimal groups to a great extent, this

stringent test of the bias-reducing qualities of crossed categorization has reliably demonstrated that intergroup bias in multiple group contexts is as great (for partial groups) or greater (for double out-groups) compared to simple group situations. Thus, crossed categorization does not reduce intergroup bias relative to simple categorization. Findings from the intergroup similarity measure support the notion that category differentiation is influenced by crossing categories in the same way as is intergroup bias (supporting a number of previous findings; Crisp & Hewstone, in press-b; Deschamps, 1977; Marcus-Newhall et al., 1993; Vanbeselaere, 1991), although there was no evidence that intergroup similarity mediated the pattern of bias.

Before becoming too disillusioned with crossed categorization as a potential means of reducing intergroup bias, it is worth reconsidering the traditional paradigm in which it has been tested. Theorists interested in crossed categorization have cited the oversimplification of uni-dimensional intergroup contexts as justification for exploring the (more 'realistic') intergroup situation that involves two dimensions of categorization activated simultaneously (Brewer & Campbell, 1976; Hewstone, 1996; Smith et al., 1996). However, focusing on just one additional dimension does not really capture the full complexity of multiple category situations in the real world, especially in an increasingly multicultural society. We are now often confronted with many more than even two dimensions of group membership. In this respect the classic crossed categorization paradigm may itself be a little simplistic. The reality is that multiple categorization is not restricted to just two dimensions of categorization and that perceivers can combine multiple dimensions in many different ways. Alternative conceptualizations of multiple categorization are needed if we are to confirm, and expand, our knowledge concerning how perceivers use multi-dimensional categorization as a guide for intergroup judgements. Such alternative conceptualizations may be more realistic, and useful (in terms of achieving reductions in bias), than the traditional paradigm employed in previous work and in Experiment 1. The purpose of Experiment 2 was to explore such an alternative conceptualization of crossed categorization.

Experiment 2

It may be possible to achieve reductions in intergroup bias via multiple group membership if we adopt an alternative theoretical focus. In contrast to the pattern of equal or increased bias obtained with the traditional paradigm, when more than two dimensions of categorization become salient we may expect a reduction in intergroup bias after all. In intergroup contexts where more than two dimensions require attention, the increased complexity of the intergroup context may mean that perceivers will be unable to use, or combine, social categorizations in meaningful ways. If this is the case, then categorization as a cue for evaluative judgment may be abandoned completely. This 'decategorization' effect (Brown & Turner, 1979) may therefore lead to reductions in intergroup bias, because the cognitive prerequisite for prejudice and discrimination (i.e., categorization; Tajfel & Turner, 1979) has been removed.[3]

That decategorization is an uncommon finding when only two dimensions of categorization are crossed is not necessarily surprising because such a categorical structure is not too complex for perceivers to utilize effectively (Vanbeselaere, 1991). However, an abandonment of categorization as a functional mechanism should be observed when the number of dimensions that need to be processed simultaneously are increased. If category cues are abandoned then instead of a clear mental representation of a dichotomous intergroup context (i.e., 'us' vs. 'them'), a more individuated (and less category based) representation may be apparent. The finding in Experiment 1 that it was the measure of category representation (intergroup similarity), that provided the best indicator of a process underlying crossed categorization is consistent with the notion that to reduce intergroup bias we need to

focus on the cognitive (categorization) basis of intergroup bias. In addition, whether the additional group memberships are in-group or out-group should be incidental (either should lead to reductions in bias) because if categorical guides to judgment are abandoned then in-group or out-group membership will have no meaning.

In this experiment, three categorization conditions were employed to examine the effects of making an additional five in-group versus five out-group memberships salient compared to the simple baseline situation involving just one in-group versus one out-group. Importantly, this paradigm explores the effects of multiple categorization on a single target dimension, rather than examining the effects of forming composite groups as in the traditional crossed categorization paradigm (see Experiment 1).[4] Thus, in contrast to the traditional paradigm where the composite groups become the target groups (e.g., AX vs. BX), here there should be too many dimensions of membership to allow meaningful category conjunctions to form. The subsequent abandonment of categorization per se should therefore have a bias-reducing effect on the initial intergroup dichotomy (e.g., A vs. B).

As well as a measure of bias, the experiment included a number of measures (cf. Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993; Gaertner, Mann, Dovidio, Murrell, & Pomare, 1990) intended to establish how participants represented the intergroup structure in the three different categorization conditions and to explore whether the effects on intergroup bias would be reflected in, and explained by, changes in group representation (as the decategorization perspective suggests). First, an item measuring participants' representation of the situation as a two-group context was included. If decategorization occurs then there should be lower ratings on this measure in the multiple group conditions. Second, a measure of individuation was included. Brewer and Miller (1984) suggested that engendering a more individuated representation can reduce intergroup bias. If multiple categorization can break down the cognitive representation of group boundaries, then perhaps it will be replaced by a more individuated representation of group members. Third, a measure of superordinate representation was included. The common in-group identity model maintains that imposing a one-group representation upon an existing two-group dichotomy can reduce intergroup bias (Gaertner et al., 1993; Gaertner et al., 1990). It is possible that rather than decategorization, multiple group membership may lead to 'recategorization' as a single more inclusive common in-group. We therefore assess this possibility with a question probing for a more inclusive 'common in-group' representation.

To summarize, according to the decategorization perspective, perceivers abandon categorical cues for evaluation when those cues become too complex, and this abandonment of categorization leads to a weakening of the perceived intergroup structure at a cognitive level (i.e., category differentiation). With the representational basis for intergroup bias removed, reductions in prejudicial attitudes and behaviour may be observed.

Method

Overview. Because our prime concern was to evaluate the potential for multiple categorization to reduce prejudice and discrimination in real world settings, we chose to use existing social groups instead of minimal groups. Although minimal groups are useful for removing confounds such as power and status, intergroup discrimination involves real groups that do have confounds such as status differentials (in addition, findings on the social identification scale from Experiment 1 suggest that participants did not identify with minimal groups to the extent that they often do with real groups). Ultimately, to develop interventions to reduce prejudice and discrimination outside of the laboratory it is necessary to use real, as well as minimal, groups. Participants were undergraduates at Cardiff University and the target intergroup dichotomy was Cardiff (in-group) vs. Bristol (out-group) students. In-group vs. out-group multiple group memberships were manipulated by selecting five additional group

memberships that were relevant to the participants. For example, most psychology undergraduates at Cardiff University are female, so this was one of the additional groups chosen to be presented with the 'Cardiff students' group membership. Any participant who was not an in-group member on all criteria used was excluded from the analysis.

Participants and design. The 55 undergraduates were randomly allocated to one of three levels of categorization: simple/multiple in-group/multiple out-group. All participants were female, living in university accommodation, 18-21 years of age, psychologists, and all 'home' students (in contrast to 'overseas' students).

Materials. Page 1 of the questionnaire required participants to indicate some 'basic information for demographic purposes'. This was to identify the group memberships of the participants and to ensure that only those who were in-group members on all categories were included. Page 2 informed participants that the experimenter was interested in perceptions of different universities. To encourage participants to form impressions of undergraduates at Cardiff and Bristol Universities (the target intergroup dichotomy) they were then asked to write a short paragraph describing what they thought the differences might be between Cardiff and Bristol students.

The three categorization conditions then diverged. Participants in the multiple group conditions were presented with a page on which they were informed that a previous survey had identified a number of distinct categories within the Cardiff and Bristol student populations[5]. They were asked to read the information carefully because they would be asked to recall it at the end. In the multiple in-group (shared) categorization condition (analogous to partial group conditions in traditional crossed categorization studies where only one dimension of categorization is shared), the additional categories for both the Cardiff and Bristol students were all in-group memberships: psychologists, females, living university accommodation, 18-21 year olds, and home students. In the multiple out-group (non-shared) categorization condition (analogous to double out-group conditions in previous crossed categorization studies where the second dimension is also non-shared along with the initial out-group categorization) this information was as above for the Cardiff students target group (i.e., all additional in-group memberships), but for Bristol students the multiple categories were all out-group memberships: engineers, males, living in private houses, 25-30 years olds, and overseas students.[6] This information was presented on a single sheet of paper, in bold type, with the labels 'Cardiff students' and 'Bristol students' above their respective five additional group categorizations. Following this manipulation participants were required to write a short description of the characteristics that they thought were associated with each of the multiple groups listed to encourage processing of the information. For Cardiff and Bristol student categories respectively the five additional categories were presented in a table on the left hand side with a box next to each for participants' descriptions. In the simple condition no additional categories were presented.

Inter-category differentiation was operationalized as the number of perceived non-shared traits attributed to the groups (for example, if three out of five traits were attributed to the in-group but not the out-group (or vice-versa) then this would be a differentiation score of '3'). Intra-category differentiation was operationalized as the number of traits attributed to the in-group or out-group as a whole. The questionnaire required participants to circle either 'yes' or 'no' as to whether they believed past research has shown each of 32 traits to be related to Cardiff and Bristol students. The 32 traits were taken from Anderson (1968) and were all neutral in connotation (i.e., likeability ratings between 250 and 350). The traits were: prudent, reserved, persistent, meticulous, unconventional, deliberate, painstaking, bold, suave, cautious, inoffensive, shrewd, methodical, nonchalant, perfectionistic, excitable, outspoken, aggressive, changeable, conservative, impulsive, unpredictable, emotional, authoritative,

restless, choosy, opportunist, impressionable, sceptical, forceful, cunning, and opinionated, presented in random order.

The evaluative measure asked participants how much they think they would/do like Cardiff and Bristol students in general (not at all, 1; very much so, 7). Finally, participants were asked to indicate the degree to which they saw Cardiff and Bristol students 'as two separate groups of people' (not at all, 1; very much so, 7), the degree to which they saw the two groups 'as separate individuals' (1, not at all; very much so, 7), and the degree to which they saw the two groups 'as one overall group' (1, not at all; very much so, 7). These items were adapted from work by Gaertner, Dovidio, and colleagues (Gaertner et al., 1993; Gaertner et al., 1990) as measures of group representation and structure.

Procedure. The experiment was carried out in large groups in the introductory week of term. Participants were informed that the study was a survey concerning perceptions of students at different universities. The three different multiple group conditions were randomly allocated.

Results

Overview. All measures were analysed using a one way between-participants ANOVA with three levels (categorization: simple/multiple in-group/multiple out-group) except evaluations which were analysed using a 3 (categorization: simple/multiple in-group/multiple out-group) x 2 (target group: in-group/out-group) mixed ANOVA with repeated measures on the second factor.

To test the specific hypotheses regarding multiple in-group or out-group membership the analytic strategy chosen was contrast analysis (Judd & McClelland, 1989; Kirk, 1982). Previous multiple category research has advocated the use of contrast analysis to test the subtle, yet complex, patterns that may be observed across multiple category groups (Hewstone et al., 1993). Thus, two sets of orthogonal polynomial contrasts were formulated. The first contrast (1); simple: 0, multiple in-group: -1, multiple out-group: +1, tested whether there was a difference between the multiple in-group and multiple out-group conditions (there should be no difference between the two multiple group conditions if the category cues are abandoned as bases for evaluation and a meaningful categorical structure). The second contrast (2); simple: +2, multiple in-group: -1, multiple out-group: -1, tested whether (given the predicted no difference between multiple in-group and multiple out-group conditions) there was a lower evaluation in multiple group conditions relative to the simple condition. Thus, the predicted weakening of category structure would be supported if contrast 2 was significant, and contrast 1 non-significant. These contrasts (or their inverse, where appropriate)[7] were tested for each measure to evaluate support for the hypothesis that there will be less bias and a weakening of the categorical representation of the target intergroup dimension under conditions of additional multiple convergent or divergent categorization relative to the baseline (no multiple groups) condition. Means for all main dependent measures are shown in Table 2.

--- Insert Table 2 about here ---

Intergroup bias. In-group and out-group evaluations were analyzed according to a 3 (categorization) x 2 (target group) mixed design ANOVA with repeated measures on the second factor. There was no main effect for categorization, F (2, 52) = .40, p = .671, although there was a main effect of target group, F (1, 52) = 53.13, p < .0005; overall participants liked the in-group (M = 5.71) more than the out-group (M = 4.87). However, this effect was qualified by a significant categorization x target group interaction, F (2, 52) = 3.94, p = .025.

To explore whether the interaction between categorization and target group was driven by changes in in-group or out-group evaluations the two contrasts were tested for both measures separately. For in-group evaluations, these analyses revealed no differences

between multiple in-group and multiple out-group conditions; contrast 1 (0, -1, +1), t (52) = -.054, p = .957; contrast 2 (+2, -1, -1), t (52) = .359, p = .721. For out-group evaluations the inverse contrasts were used; contrast 1 (0, +1, -1) was non-significant, t (52) = -.621, p = .537; however, contrast 2 (-2, +1, +1) approached significance; t (52) = 1.81, p = .077. Participants' evaluations of the out-group were higher after multiple group memberships were made salient (whether these were in-group or out-group memberships; $M_{multiple\ in\text{-}group}$ = 4.95; $M_{multiple\ out\text{-}group}$ = 5.17) than if no additional memberships were made salient (M_{simple} = 4.50; see Table 1). This suggests that the effect is driven by changes in out-group perception rather than in-group perception. Importantly, simple main effects revealed that intergroup bias (i.e., relative evaluation of the in-group vs. the out-group) remained in each of the three categorization conditions (simple, F (1, 52) = 40.43, p < .0005; multiple in-group, F (1, 52) = 14.19, p < .0005; multiple out-group, F (1, 52) = 6.19, p = .016). This suggests that although additional multiple in-groups and out-groups had an effect (on out-group evaluations), bias was not eliminated.

As in Experiment 1, it is useful here to examine difference scores (in-group minus out-group evaluations) since these allow a direct comparison between levels of bias in different experimental conditions. As predicted, contrast analysis revealed support for contrast 2 only (+2, -1, -1), t (52) = 2.69, p = .010 (contrast 1; 0, -1, +1; t (52) = -.845, p = .402). Intergroup bias in both multiple in-group (M = .737) and multiple out-group (M = .500) conditions was lower than in the baseline (simple) condition (M = 1.28), while bias in the two multiple group conditions did not differ. Thus, as predicted, the effect of crossing an existing in-group/out-group dichotomy with multiple dimensions of categorization was a reduction in bias whether the multiple groups were in-group or out-group in nature (see Figure 1).

--- Insert Figure 1 about here ---

Category differentiation. For inter-group differentiation there was a trend in line with the intergroup bias (M_{simple} = 11.22; $M_{multiple\ in\text{-}group}$ = 8.00; $M_{multiple\ out\text{-}group}$ = 9.72), however, a one-way ANOVA on the three categorization conditions was non-significant, F (2, 52) = 1.27, p = .290. Contrasts 1 and 2 were also non-significant; contrast 1, t (52) = .850, p = .399; contrast 2, t (52) = 1.33, p = .188.

Intra-category differentiation was operationalized as the number of traits attributed to the in-group and out-group as a whole. If the number of traits attributed to the in-group and out-group was higher in multiple category, compared to simple category, conditions this would indicate a more dispersed and inclusive category representation in line with the decategorization hypothesis. A one-way (categorization: simple/multiple in-group/multiple out-group) between-participants ANOVA carried out on the combined in-group and out-group trait attributions was non-significant, F (2, 52) = 2.38, p = .103. However, there was support for the crucial contrast; contrast 2 (-2, +1, +1), t (52) = 2.07, p = .044 (and in line with predictions contrast 1 (0, -1, +1) was non-significant; t (52) = .730, p = .469). This suggests that, consistent with the hypothesis regarding category structure, multiple categorization did lead to a more inclusive intra-category structure. Greater intra-category variability was observed in both the multiple in-group (M = 16.87) and multiple out-group (M = 18.11) conditions relative to the simple categorization condition (M = 14.42; which, according to category differentiation principles is also in line with reduced inter-category reliance)[8].

Representation as two-groups. A one-way ANOVA revealed significant variation between the three experimental conditions, F (2, 52) =3.93, p = .026. As predicted, there was support for contrast 2 (+2, -1, -1), t (52) = 2.73, p = .009; but not for contrast 1 (0, -1, +1), t (52) = .607, p = .547. This pattern parallels that found for the measure of intergroup bias;

participants perceived the intergroup context as less of a two-group situation in the multiple in-group (M = 2.66) and multiple out-group (M = 3.00) conditions than in the simple categorization baseline condition (M = 4.17), and there was no difference in the perception of group structure in the multiple category conditions. This adds weight to the notion that there is less intergroup bias in the multiple group conditions due to a reduced tendency to view the targets as two distinct group representations.

Representation as individuals. A one-way ANOVA was non-significant, F (2, 52) = 2.27, p = .114. However, contrast 2 was supported (-2, +1, +1), t (52) = 2.01, p = .050; whilst contrast 1 (0, +1, -1) was non-significant, t (52) = .671, p = .505. Again, this pattern parallels that found for the measure of intergroup bias; participants perceived the targets as more like individuals in the multiple in-group (M = 5.59) and multiple out-group (M = 5.23) conditions than in the simple baseline condition (M = 4.45), and there was no difference in the perception of group structure between the multiple category conditions. In line with Brewer and Miller (1984) this suggests that as the two-group representation degraded it was replaced by a more individuated representation[9].

Representation as a superordinate group. A one-way ANOVA was non-significant, F (2, 52) = .991, p = .378. There was no support for either contrast 1 (0, +1, -1), t (52) = -1.09, p = .280, or contrast 2 (-2, +1, +1), t (52) = .907, p = .369, suggesting that a more inclusive, or superordinate, category structure does not replace the initial two-group structure following multiple categorization.

Mediational analysis. If considering the multiple groups that make up broader categories can lead to less of a reliance on categorical structures for guiding evaluative judgments, then we may expect participants' representation of the intergroup context to mediate intergroup bias. To test this possibility, the multiple regression procedure for testing mediation advocated by Baron and Kenny (1986; see also Judd & Kenny, 1981) was used. The predictor (simple vs. multiple categorization) was the contrast code that reflected the pattern across all the reliable measures; simple, +2; multiple in-group, -1; multiple out-group, -1. The outcome was intergroup bias (in-group minus out-group allocations), whilst the mediators were participants' representation of the targets as two-groups and representation of the targets as individuals (see Figure 2). In the first equation the predictor contrast (categorization) significantly predicted the outcome (intergroup bias), β = .346, p = .010. In the second equation the predictor contrast (categorization) was also significantly related to both mediators; two-group representation, β = .354, p = .008; representation as individuals; β = .269, p = .047. To establish partial mediation it is necessary to show that the mediators are related to the outcome measures when controlling for the predictor. First, the participants' two-group representation also predicted intergroup bias when controlling for categorization and representation as individuals, β = .273, p = .056. This demonstrated that participants' two-group representation can explain the pattern of bias obtained (i.e., reductions in bias in multiple group conditions relative to simple group conditions were due to corresponding changes in the extent to which participants' represented the intergroup context as a two-group situation). Second, the participants' representation as individuals was not related to intergroup bias when controlling for categorization and two-group representation, β = -.186, p = .176. Participants' representation of the intergroup context as involving individuals did not explain the pattern of bias. Thus, participants' representation of the extent to which the situation was a two-group context partially mediated the different levels of intergroup bias observed, but representation of the targets as individuals did not. Finally, for full mediation the effect of the predictor on the outcome should become non-significant when controlling for the mediators: When the perception of a two-group context and individuals were controlled, the effect of categorization on intergroup bias did indeed become non-significant, β = .200, p = .133. This

suggested that the weakening of participants' representation of the intergroup context as dichotomous could fully (rather than only partially) explain the reduction in bias.

--- Insert Figure 2 about here ---

Discussion

The purpose of Experiment 2 was to advance an alternative conceptualization of multiple categorization and to further evaluate the potential for reduced bias via multiple categorization utilizing a new paradigm. Previous work has used a crossed categorization paradigm that focused on composite groups formed by the simultaneous activation of two dimensions of group membership. In contrast, the present experiment made an additional five dimensions of categorization salient. Whereas multiple groups formed using the traditional paradigm (Experiment 1) yielded no reduction in intergroup bias relative to simple categorization, making more than two dimensions of categorization salient did reduce intergroup bias compared to the simple categorization baseline. The pattern of bias observed suggests that although making multiple dimensions of categorization salient does not eliminate bias, there is a significant reduction, whether the additional categories are shared (in-group) or non-shared (out-group) with the perceiver. The notion that participants' reduced bias was the result of a decategorizing effect was supported by the findings that participants in these conditions perceived the intergroup situation as less of a clearly dichotomous two-group encounter and that this tendency mediated the pattern of intergroup bias. There was also evidence that participants saw the targets as more like individuals than group members and that inter-category trait differentiation (and intra-category trait differentiation) reflected the effects of multiple categorization on intergroup structure, although these latter effects were weaker and neither were directly related to intergroup bias.

Findings from the mediational analysis suggest an explanatory role for perceivers' group representation with regard to the level of intergroup bias observed. Participants who were encouraged to think about specific shared (in-group), or non-shared (out-group), multiple group memberships in addition to the target group dichotomy seemed also to represent the group structure in a less dichotomous way. They correspondingly displayed lower levels of intergroup bias against the target out-group (although category cues were not abandoned completely as a means of guiding judgments since significant bias persisted even in the multiple group conditions).

These findings suggest that as well as a weakening of the categorical structure, multiple categorization also leads to greater individuation of group members. Participants in multiple category conditions were more inclined to think of the target groups in terms of individuals rather than as group members. This supports Brewer and Miller's (1984) personalization model, although the tendency towards individuation did not mediate the level of bias observed as they would predict. Interestingly, there was also no tendency to think of the target groups in terms of a more inclusive overall category (a common in-group identity). This supports the view that superordinate categorization and subordinate crossing of categorizations are conceptually distinct. Changes in out-group evaluations drive the effect, and this is consistent with the social identity underpinnings of the common in-group identity model (Gaertner et al., 1993; 1990). Along with the other measures of perceived category structure, these findings also add weight to the idea that crossing categories leads to less category-based responding, rather than a more inclusive use of categorization.

Since multiple categorization does seem to lead to a weakening of the perceived intergroup structure, we would therefore expect corresponding changes in the intra-category structure. As the boundaries between an intergroup dichotomy break down, so the intra-group structure of the categorizations should become more inclusive and varied (Doise, 1978). Some support for this was found on the trait measure of intra-category differentiation. This

suggests that further exploration of the effects of multiple group membership on inter- and intra-category structure (such as measures of perceived group variability and stereotyping) would be useful for clarifying the relationship between category representation and intergroup bias.

General Discussion

The purpose of this research was to test the bias-reducing potential of crossed categorization. Experiment 1 was designed to address criticisms of previous studies and to provide a refined test of the bias-reducing properties of multiple group membership using the traditional paradigm. The results of Experiment 1 demonstrated that partial groups were discriminated against as much as simple groups, whereas the double out-groups were discriminated against significantly more than both of the others. In contrast, when five dimensions of categorization were salient in Experiment 2, reductions in bias were obtained, relative to the simple categorization baseline condition, for both multiple in-group and out-group conditions.

The particular pattern of bias found in Experiment 1 may seem to be disappointing with regard to creating a viable intervention to reduce intergroup discrimination via crossed categorization involving just two dimensions of categorization (compounded by the finding that crossing categorizations has no lasting effect once the crossed category groups are devolved into their constituent simple groups). Partial groups were discriminated against as much as simple out-groups, suggesting that crossing with one additional dimension of group memberships salient does not necessarily reduce discrimination. In fact, such a procedure would lead to increased discrimination against double out-groups. Despite this, the possibility remained that reductions in bias may be obtained with the crossing of just one additional dimension of membership. Bias shown towards partial groups is consistently less than that shown towards double out-groups. In many intergroup contexts multiple memberships may be already salient, and ‘two-dimensional’ crossed categorization may be important with regard to reducing discrimination relative to existing double out-groups. This is a situation Brewer and Campbell (1976) termed ‘converging boundaries’, in which multiple intergroup differences coincide. An example is given by anthropologist Clifford Geertz (1973) who notes that the Tamil minority in Sri Lanka is "set off from" the Sinhalese majority by religion, language, race, region and social custom. In these situations it may be possible to shift emphasis from one of the out-group categorizations to a dimension on which the target is in-group with the perceiver, thus reducing discrimination. In effect, a successful intervention can make the existing double out-group member a new partial in-group member. For example, the Black female job applicant may face increased discrimination due to her double out-group status in a White male dominated field. Shifting emphasis from her out-group status on the race (or gender) dimension to one on which she shares membership with the potential employer (e.g., young-old) would effectively give her partial group status (i.e., as a young female in a young male dominated field), and correspondingly we would expect reduced discrimination relative to her previous double out-group status. The practicality of manipulating the salience of multiple group membership is an important issue to address in future work.

Notwithstanding the above possibilities for crossing two dimensions of categorization, the novel paradigm utilized in Experiment 2 may offer a more workable alternative. Whereas the traditional paradigm for testing crossed categorization yields no reduction in intergroup bias (Experiment 1), significant reductions in bias for both multiple in-group and out-group categorization were obtained when five additional dimensions of categorization were made salient (Experiment 2). In addition, although multiple group membership only reduced the level of bias, it is possible that there may be a correlation between the number of dimensions

crossed and the level of bias. Future work may establish such a correlation and find that with more than five crossed dimensions, or under certain antecedent conditions, an elimination of bias can be achieved. There was also support for the theoretical underlying mechanism of decategorization and an abandonment of the categorical structure in multiple category situations.

There are some limitations to the current work. First, we did not compare traditional and alternative crossed category paradigms in the same study. Second, although it was beneficial to use real groups in Experiment 2 to enhance ecological validity, there was no measure of the differential importance or status of these groups. It is likely that crossing categories with dimensions that are more or less important than the target dimension will have a moderating effect on the bias-reducing consequences of multiple categorization. Third, although the measures of category structure employed were useful in determining the initial value of crossing more than just two dimensions of categorization, more process oriented measures of category representation should be used in future work.

Once an intergroup context is salient then category differentiation forms the basis of, but cannot fully explain, intergroup bias. To fully explain the in-group favouring nature of prejudice it remains necessary to appeal to social identity theory's motivational postulates (Tajfel & Turner, 1979). However, the research reported here suggests that multiple categorization may be able to lead to reductions in intergroup bias by affecting the initial cognitive basis for discrimination (the prerequisite for social categories to acquire meaning and motivational implications). That is, whilst explanations of existing discrimination between social groups need to consider the social context (e.g., social conflict, identity threat), the present work suggests that to reduce bias it may be helpful to target the initial cognitive basis that gives psychological meaning to intergroup bias. Notwithstanding the need to consider the social context in explaining bias, multiple categorization seems to offer us a way to attack the causes of prejudice at a fundamental cognitive level.

Does crossed categorization reduce intergroup bias? The answer is that it does, ultimately, depend on your perspective. The traditional paradigm for testing crossed categorization effects employed in Experiment 1 produced 'compound' categories (such as AX, AY, etc.) which were discriminated against as much as simple groups. However, in Experiment 2, where the participants focused on the initial target intergroup dichotomy, multiple categorization did lead to a reduction in bias. In other words, from one perspective where multiple categorization creates compound categories, no reduction in bias is achieved; but from an alternative perspective where multiple group membership influences the category representation of a distinct intergroup dichotomy, reductions in bias are possible. Overall, these findings testify to the need to consider more diverse and varied paradigms for exploring multiple category phenomena. Such triangulation of theorizing and methodology can be advantageous. Indeed, the current findings suggest that studying more flexible conceptualizations of multiple group membership can aid not only in theoretical advances, but also the applied usefulness of multiple categorization.

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Footnotes

1. There was no 'fatigue' effect of completing twice the standard number of matrices since a 'matrix set' factor (i.e., the points allocated in the first compared to the second half of the matrices) had no effects on intergroup bias.

2. As well as using the matrices to measure intergroup bias, we also analyzed the strategies utilized by participants in making their allocations (e.g. Bourhis, Sachdev, & Gagnon, 1994; Tajfel et al., 1971). We tested seven strategies (where FAV denotes in-group favouritism, F denotes fairness, MJP denotes the maximum joint profit, MIP denotes maximum in-group profit, and MD denotes maximal difference in favour of the in-group): (i) the pull of FAV alone, (ii) the pull of F on FAV, (iii) the pull of FAV on F, (iv) the pull of MJP on FAV, (v) the pull of FAV on MJP, (vi) the pull of MJP + MIP on MD and (vii) the pull of MD on MJP + MIP. A positive pull indicates the pursuit of the relevant strategy over the alternative, a negative pull indicates the pursuit of the opposite of the strategy. Thus, for example, a positive pull of FAV on MJP would indicate discriminatory behaviour (in-group favouritism being the chosen strategy compared to maximum joint profit). A one-way ANOVA on the strategy of in-group favouritism alone (FAV) by levels of categorization revealed a significant difference between the three groups, F (2, 47) = 4.67, p = .014. Post hoc analysis revealed that FAV was employed more by participants allocating points to double out-group members (M = 10.27) than participants allocating points to either simple out-group (M = 7.97) or partial group (M = 7.72) members (Newman-Keuls, $p < .05$). One sample t-tests on each of the categorization conditions revealed that all groups varied from 6.50, the point of no bias; simple, t (16) = 2.27, p = .037, partial, t (16) = 2.03, p = .06, double out-group, t (15) = 5.55, $p < 0.001$, although, as expected, the effect of this pull was only marginal in the partial group condition and strongest in the double out-group condition. Only one of the other strategies yielded significant differences between the three categorization conditions, this being the pull of FAV on F, F (2, 47) = 3.85, p = .028. This strategy was utilized more by participants in the double out-group condition (M = 6.47) than either the simple out-group (M = 2.79) or partial group (M = 1.82) conditions, where the extent of the pull was equivalent (Newman-Keuls, p's $< .05$). These findings are in line with previous work that has found little evidence for the differential use of the strategies in crossed categorization settings (Brown & Turner, 1979).

3. Some previous work into crossed categorization has explored this decategorizing effect of crossing categories (Deschamps, 1977) and there is some evidence of an abandonment of the categorical structure when cues for categorization diverge (Brown & Turner, 1979; Crisp & Hewstone, 1999b) as well as under different antecedent conditions such as positive affective states (Crisp & Hewstone, in press-b; Urban & Miller, 1998).

4. One previous study has explored the effects of crossing three dimensions of categorization (Hewstone et al, 1993), although the focus was still consistent with the traditional focus on forming composite groups rather than exploring the effects of additional categorizations on an independent and single target intergroup dichotomy.

5. Although the wording here may suggest that the additional categories were subgroups of the target categories (Cardiff and Bristol students), the nature of the actual additional categories used was such as to preclude the tendency to subgroup (i.e., 'females', '18-21 year olds'), and all other instructions focused participants on the additional categories as important and inclusive in their own right. It is also important to note that what is important here is the attention to additional bases for classification per se, rather than any notion of inclusiveness, that is expected to lead to a general abandonment of categorization as a functional mechanism. If perceivers abandon categorization as a useful guide to evaluation on

encountering multiple dimensions, the specific categorical nature of those dimensions will be incidental.

6. The decategorization effect should emerge from the complexity inherent in attending to multiple dimensions of categorization. Whether those dimensions can be comprised of only two, or many more potential categories, is incidental to the predicted effects.

7. The same two contrasts were used across all dependent measures, however, the inverse of these contrasts (0, -1, +1; and +2, -1, -1) was used for some measures for theoretical reasons. For instance greater in-group evaluation is predicted for the in-group in the simple condition than either of the multiple group conditions (hence the contrast +2, -1, -1). However, bias can also be reflected in lower out-group evaluations, so we may also expect the inverse of this contrast (-2, +1, +1) reflecting lower out-group evaluation in the simple condition compared to the multiple group conditions. Thus, the contrasts (0, -1, +1; and, +2, -1, -1) were used to test in-group evaluations, intergroup bias, inter-category differentiation, and representation as two groups; whilst the inverse of these contrasts (0, +1, -1; and, -2, +1, +1) is used to test out-group evaluations, intra-category differentiation, representation as individuals and representation as a superordinate group.

8. It should be noted that this measure was primarily designed to assess inter-category differentiation, and whilst attribution of a greater number of traits (in multiple category conditions) to in-groups and out-groups is consistent with an accentuation of intra-category differentiation (accompanying attenuation of inter-category differentiation; Doise, 1976), the participants here were not rating individuals, but traits applicable to the group as a whole. As such, the findings may reflect greater complexity in intra-group perception, but the individual group members may still be perceived as homogeneous. For this reason this measure was excluded from any subsequent mediational analysis.

9. As expected, the two-group representation and representation as individuals measures were negatively correlated, r (55) = -.428, p = .001, which is also in line with Brewer and Miller's (1984) idea that as category based responding declines, more personalized responding takes over.

Table 1
Points allocations, intergroup bias, matrix strategies, and intergroup similarity as a function of categorization condition (Experiment 1).

Measure	Categorization condition		
	Simple (n = 17)	Partial (n = 17)	Double out-group (n = 16)
In-group allocations			
M	210.53_a	207.59_a	244.31_b
SD	(42.71)	(33.50)	(42.80)
Out-group allocations			
M	166.76_a	168.88_a	144.81_a
SD	(38.04)	(24.29)	(39.22)
Intergroup bias			
M	43.76_a	38.71_a	99.50_b
SD	(76.89)	(54.21)	(80.90)
Intergroup similarity			
M	4.53_a	4.88_a	2.88_b
SD	(2.15)	(1.58)	(1.82)

Note. Within rows, means with different subscripts are significantly different ($p < .05$, Newman-Keuls)

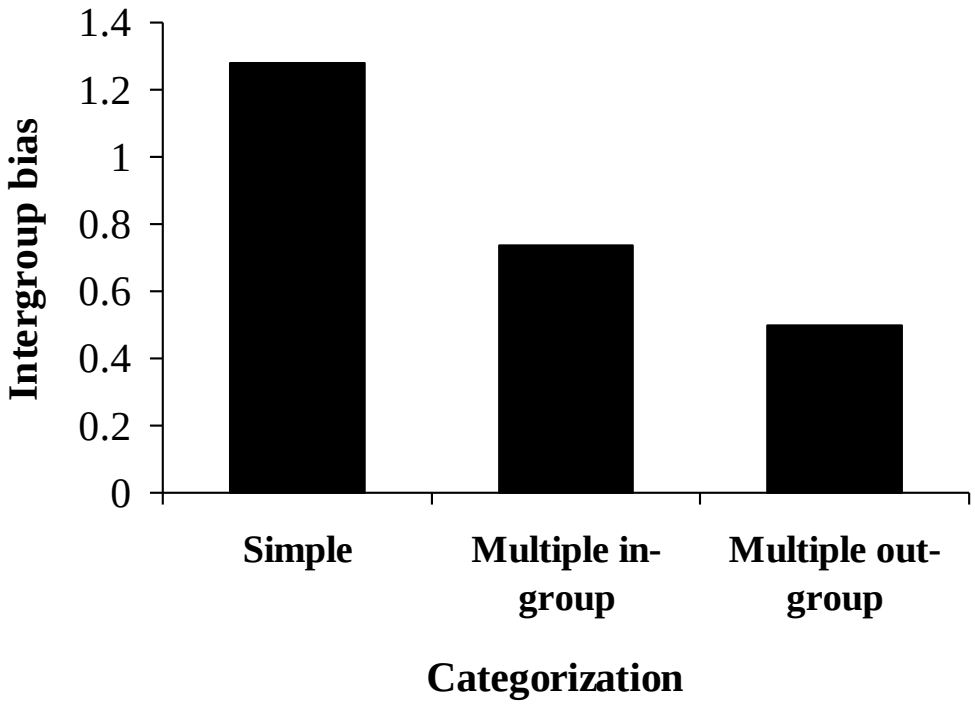
Table 2.
Means and standard deviations of all dependent measures (Experiment 2).

	Categorization condition		
	Simple n = 18	Multiple in-group n = 19	Multiple out-group n = 18
In-group evaluations			
M	5.78_a	5.68_a	5.67_a
SD	(.94)	(1.00)	(1.03)
Out-group evaluations			
M	4.50_a	4.95_b	5.17_b
SD	(1.10)	(.97)	(1.15)
Intergroup bias			
M	1.28_a	$.737_b$	$.500_b$
SD	(.67)	(.99)	(.86)
Inter-category differentiation			
M	11.22_a	8.00_a	9.72_a
SD	(5.84)	(5.66)	(6.94)
Intra-category differentiation			
M	14.42_a	16.87_b	18.11_b
SD	(3.97)	(4.70)	(6.55)

Table continues…

Perception of two groups			
M	4.17_a	2.66_b	3.00_b
SD	(1.76)	(1.27)	(2.03)
Perception of individuals			
M	4.45_a	5.59_b	5.23_b
SD	(1.72)	(1.50)	(1.77)
Perception of a common in-group			
M	4.78_a	4.90_a	5.44_a
SD	(1.48)	(1.20)	(1.82)

Note. Within rows, means with different subscripts are significantly different ($p < .05$ except out-group evaluations where $p < .08$).


Intergroup bias
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Simple
Multiple in-group
Multiple out-group
Categorization

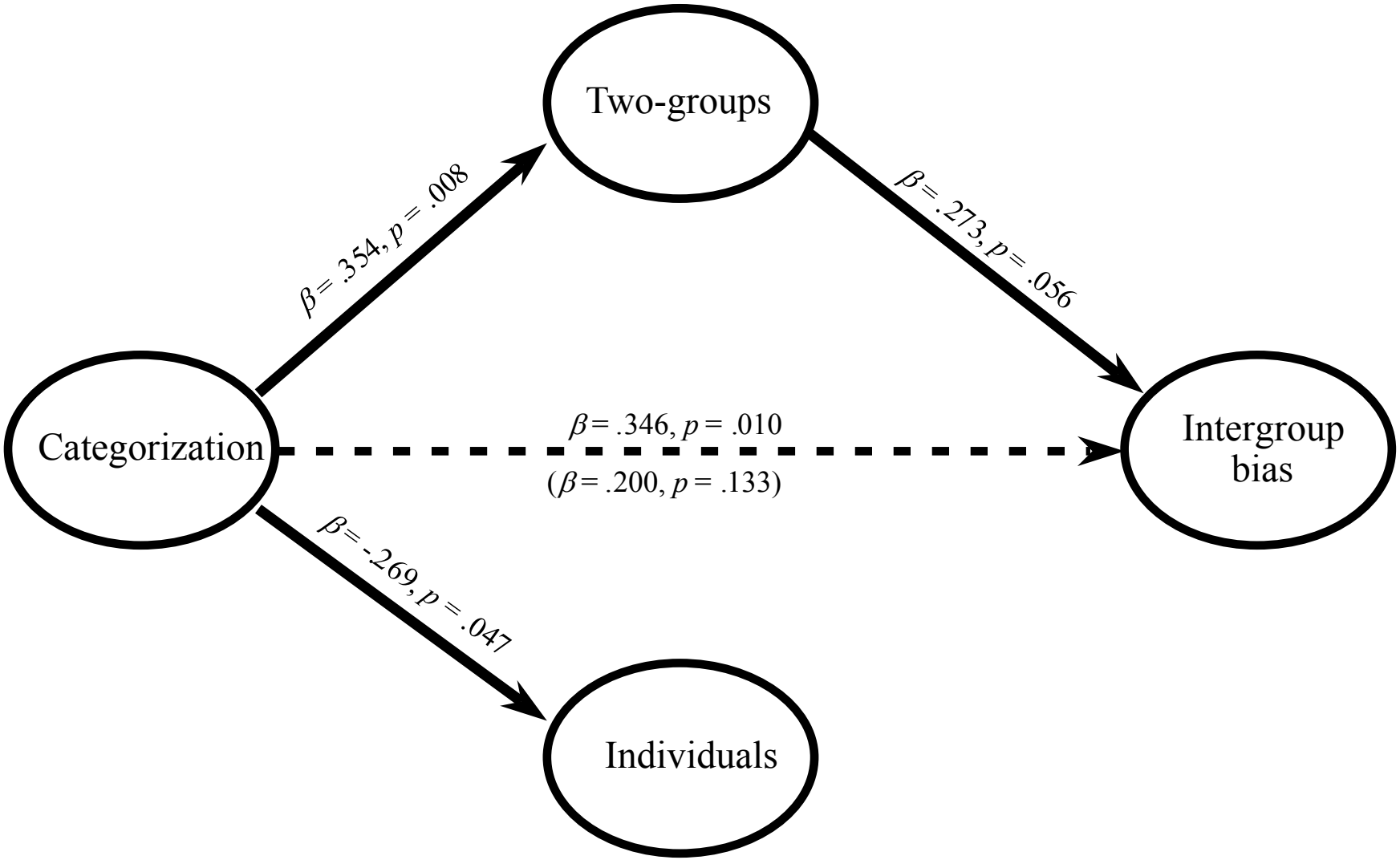

Two-groups
β = .354, p = .008
β = .273, p = .056
Categorization
β = .346, p = .010
(β = .200, p = .133)
Intergroup bias
β = -.269, p = .047
Individuals

Figure captions

Figure 1. Intergroup bias (differential in evaluations of the in-group and out-group) as a function of type of multiple group membership (simple, multiple in-group, and multiple out-group), Experiment 2.

Figure 2. Mediational model showing the relationship between categorization (simple/multiple in-group/multiple out-group), two-group representation, representation as individuals, and the outcome of intergroup bias (Experiment 2). Only significant paths are shown. In the central path the direct effect of group membership on intergroup bias is shown in parentheses.