



## The Group-Member Mind Tradeoff: Attributing Mind to Groups versus Group Members

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RUNNING HEAD: Group and Individual Mind

The Group-Member Mind Tradeoff:  
Attributing Mind to Groups versus Group Members

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## Abstract

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People attribute minds to other individuals and rely on mental state inferences to explain and predict their behavior. Little is known, however, about whether people also attribute minds to groups and consider that collectives, companies, and corporations can think, intend, and plan. Even less is known about the consequences of these attributions for both groups and group members. We investigate the attribution of mind and responsibility to groups and group members and demonstrate a tradeoff: the more people attribute a mind to a group, the less people attribute minds to individual members of that group. Groups that are judged to have more group mind are also judged to be more cohesive and responsible for their collective actions. These findings have important implications for how people perceive the minds of groups and group members, and how attributions of mind influence attributions of responsibility to groups and group members.

Word count: 147

Keywords: groups; theory of mind; mind attribution; morality; responsibility, law.

## The Group-Member Mind Tradeoff:

## Attributing Mind to Groups versus Group Members

People recognize that others around them can think, intend, and plan, and therefore understand and evaluate others' behavior in mental state terms (Frith & Frith, 2003; Heider & Simmel, 1944; Wimmer & Perner, 1983). However, the extent to which people also attribute minds to entire groups of people is less clear. Whether or not people are willing to impute a Republican *agenda*, the *will* of the Russian people, or IBM's *plans* for the next fiscal year is a matter of debate. For example, the United States Supreme Court recently granted corporations the right to contribute to political campaigns (effectively granting them personhood), although Justice Stevens noted in dissent, "corporations have no consciences, no beliefs, no thoughts, no desires" (Citizens United v. Federal Election Commission, U.S., 2010). Psychological research suggests that some cultures are more likely to attribute minds to groups than others (Menon, Morris, Chiu, & Hong, 1999), people are more willing to attribute particular mental states (e.g., intentions) versus others (e.g., feelings) to groups (Knobe & Prinz, 2008), and some groups are more likely to be seen as having a group mind than others (Hamilton & Sherman, 1996; Lickel, Hamilton, Wierzchowska, Lewis, Sherman, & Uhles, 2000).

Beyond the attribution of group mind, even less is known about the *relationship* between attributions of group mind and attributions of mind to the members of the same group. The present research illustrates the conditions under which people attribute minds to groups and reveals a novel tradeoff in people's intuitive attributions of mind to groups versus group members.

Previous research has demonstrated that factors such as joint action and cohesion increase attributions of mind to groups (Bloom & Veres, 1999; O'Laughlin & Malle,

## Group and Individual Mind

2002) and increase the perception of groups as having the same properties as persons (Hamilton & Sherman, 1996). Strong ingroup identification can also increase perceptions of ingroup and outgroup entitativity, increasing the perception of members of both group types as relatively homogeneous and deindividuated (Quattrone & Jones, 1982; Yzerbyt, Castano, Leyens, & Paladino, 2000). Perceived group cohesion, or entitativity (Campbell, 1958), also tends to elicit stereotyping of group members (Abelson, Dasgupta, Park, & Banaji, 1999; Yzerbyt, Corneille, & Estrada, 2001), diminishing the perception of group members as true individuals and reducing the attribution of mind to these members (Morewedge & Schooler, 2011).

Research programs have pursued, largely in parallel, attributions of mind to groups and to group members. The relationship between group mind and member mind has therefore been unexplored, despite the considerable consequences for moral judgment and decision-making. In particular, attributions of mind to a group can crucially influence attributions of responsibility to the group and its members. The charge of conspiracy, for example, requires that an assembly of distinct individuals acted with collective intent. Similarly, the decision to punish an individual employee in a corporation when the corporation defrauds its customers often hinges on determining whether the motivations and plans of the collective match the motivations and plans of the individual (see Malle, 2011; Sherman & Percy, 2011).

Here we test the hypothesis that an inverse relationship exists between attributions of group mind and member mind: the more people attribute minds to a group, the less they attribute minds to the individual members of the group, and vice versa. This hypothesis is based on studies reviewed above showing that the same factor of group cohesion has opposite effects of people's attributions of group mind and member mind.

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3 We present four studies that support the predicted tradeoff between group and member  
4 mind. First, we establish the phenomenon: the more mind people attribute to groups, the  
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6 less mind they attribute to group members. Second, we replicate this phenomenon with a  
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8 novel set of groups and demonstrate the consequences of mind attribution for  
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10 responsibility attribution. Third, we demonstrate that manipulating the entitativity of the  
11  
12 same set of groups produces the tradeoff. Finally, using visual versus verbal stimuli, we  
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14 show that manipulating the cohesiveness of the group can produce this same tradeoff not  
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16 only for mind but also for responsibility attributions: the more responsibility people  
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18 attribute to groups for their collective actions, the less responsibility they attribute to  
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20 group members for their personal actions. Together, these studies demonstrate the group-  
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22 member mind tradeoff and reveal the consequences for attributions of responsibility to  
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24 groups and group members.  
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### 31 Study 1: The Group-Member Mind Tradeoff

#### 32 Method

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36 *Participants.* Twenty-four people (8 male, 15 female, 1 unreported,  $M_{age} = 42.91$ )  
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38 completed the study online for \$0.25 via Amazon Mechanical Turk. Demographic  
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40 factors such as age and gender did not meaningfully affect results in any of the studies in  
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42 the present research and will not be discussed further.  
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46 *Procedure.* Participants evaluated 20 target groups (e.g., McDonald's corporation,  
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48 the New York Yankees, the US Marine Corps, all Facebook users)<sup>i</sup> on the extent to  
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50 which each group has a mind of its own (described as the capacity to plan, intend, and  
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52 think for itself), the extent to which the average member of each group has a mind of  
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54 his/her own, and the extent to which each group is cohesive (described as how similar  
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56 group members are to each other, the extent to which they share a common fate, and how  
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## Group and Individual Mind

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3 tightly knit the group is). Participants rated mind for groups and individuals from 1 (not  
4 at all) to 7 (very much), and cohesion from 1 (low cohesion) to 7 (high cohesion). We  
5 averaged judgments of each variable for each group for the following analyses.  
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## Results and Discussion

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12 Of chief importance, attributions of group mind correlated negatively with  
13 attributions of member mind,  $r(18)=-.60, p<.01$ . The more people attributed mind to a  
14 group, the less people attributed mind to members of that group. In addition, attributions  
15 of group mind correlated positively with judgments of group cohesion,  $r(18)=.87,$   
16  $p<.0001$ , whereas attributions of member mind correlated negatively with judgments of  
17 group cohesion,  $r(18)=-.78, p < .0001$  (Figure 1; see Table 1 for summarized results of all  
18 studies). These results provide initial evidence for an inverse relation between people's  
19 judgments of group versus member mind. Given that mind attribution has critical  
20 implications for responsibility judgments (Gray, Gray, & Wegner, 2007), the next study  
21 was designed to test the consequences of the group-member mind tradeoff for  
22 responsibility judgments.  
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## Study 2: Mind and Moral Responsibility

## Method

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*Participants.* Eighteen participants (5 male, 12 female, 1 unreported,  $M_{age} =$   
39.58) completed the study online as in Study 1.

*Procedure.* Participants evaluated 20 different groups (e.g., Burger King corporation, the Boston Red Sox, the US Navy, all Twitter users). Participants evaluated groups on group mind, member mind, and group cohesion as in Study 1. In addition, participants also rated the extent to which each group is morally responsible for its collective actions, the extent to which the average group member is morally

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3 responsible for his/her own personal actions, and the extent to which the average group  
4 member is morally responsible for the group's collective actions (1=not at all, 7=very  
5 much). We averaged judgments of each variable for each group.  
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## 10 Results and Discussion

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12 As in Study 1, the group-member mind tradeoff emerged: attributions of group  
13 mind correlated negatively with attributions of member mind,  $r(18)=-.71, p<.0001$ . The  
14 more people attributed minds to groups, the less they attributed minds to members of  
15 those groups. In addition, the same relationships observed in Study 1 between group  
16 mind, member mind, and group cohesion emerged in this study: group mind correlated  
17 positively with group cohesion,  $r(18)=.91, p<.0001$ , and member mind correlated  
18 negatively with group cohesion,  $r(18)=-.74, p<.0001$  (Figure 1).  
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29 An important relationship between attributions of mind and attributions of  
30 responsibility also emerged. Attributions of group mind correlated positively with  
31 attributions of responsibility to the group for its collective actions,  $r(18)=.87, p<.0001$ , as  
32 well as attributions of responsibility to each individual member for the group's collective  
33 actions,  $r(18)=.87, p<.0001$ ; the more mind people attributed to a group, the more  
34 responsibility they attributed to the group for its collective actions, and the more  
35 responsibility they attributed to each group member for the group's collective actions.  
36 (Conversely, member mind correlated negatively with these two variables,  $r(18)=-.62,$   
37  $p<.01$ , and  $r(18)=-.70, p=.001$ ). Judgments of member responsibility for member actions  
38 were close to ceiling ( $M=6.56$ ) and therefore did not correlate with other measures.  
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53 Consistent with prior research, these findings demonstrate that attributing mind to  
54 an entity (e.g., a group) renders that entity a moral agent that can then be held responsible  
55 for its actions (Gray et al., 2007). Importantly, this study establishes the relationship  
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## Group and Individual Mind

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3 between mind and responsibility attributions not simply for individual agents but for a  
4 complex and ambiguous entity: the *group*. Furthermore, Study 2 reveals a novel  
5 relationship between mind and responsibility in demonstrating that attributions of mind to  
6 the group correspond positively with attributions of responsibility to the group and even  
7 individual *members* of the group for the group's collective actions.  
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15 Study 2 not only replicates the group-member mind tradeoff established in Study  
16 1, but also shows direct consequences of this tradeoff for judgments of collective  
17 responsibility. Yet the results of this study do not allow us to draw causal conclusions  
18 about the relationship between judgments of cohesion and attributions of mind and  
19 responsibility. We therefore conducted a third study using an experimental manipulation  
20 to examine the causal role of group cohesion in the group-member mind tradeoff.  
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## Study 3: Manipulating Group Cohesion Conceptually

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31 Because judgments of group cohesion appear to be strongly related to attributions  
32 of group mind, Study 3 manipulated group cohesion rather than simply measuring it.  
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34 We show that, holding the group itself constant, simply varying information about three  
35 tenets of entitativity—similarity, proximity, and common fate (Campbell, 1958)—across  
36 two conditions is sufficient to produce the group-member mind tradeoff. In addition,  
37 whereas Studies 1 and 2 ask participants to evaluate naturally heterogeneous groups,  
38 Study 3 demonstrates the tradeoff within a more restricted set of groups all of the same  
39 qualitative type (i.e. university student organizations).  
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## Method

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53 *Participants.* Sixty-two people (26 male, 36 female,  $M_{age}=31.73$ ) completed the  
54 study online as in Studies 1 and 2.  
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*Procedure.* Participants were told they would evaluate student clubs from a major American university and were randomly assigned to one of two conditions, varying only in terms how each group was described. These descriptions served as a manipulation of cohesion. All participants read about twelve different student organizations (jazz club, chess club, improv comedy, mock trial, debate club, poetry club, trivia club, model United Nations, ballroom dance club, singers club, and drama club), four of which were described in high cohesion terms, four of which were described in moderate cohesion terms, and four of which were described in low cohesion terms.

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Groups were described as high, low, or moderate cohesion, between conditions, by including minimal information about their similarity, proximity, and common fate (Campbell, 1958). This manipulation produced groups of three types. For example, in Condition A, the description for drama club was *low cohesion*: “People in the drama club are from cities and countries around the world, they include freshman, sophomores, juniors, and seniors, they live not only all over campus, but all around the city, and they have participated in a number of drama productions and competitions in separate troops and casts.” In Condition B, the description for drama club was *high cohesion*: “Everybody in the drama club is from Ypsilanti, Michigan, they are all seniors, they live in the same house on campus, and they recently participated together as an ensemble in a national production.” Moderate cohesion groups were the same across condition and contained information that made them appear average in terms of cohesion. Condition did not interact with any factors of interest, so analyses collapse across condition.

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Participants rated the extent to which each group has a mind, the extent to which the average member of the group has a mind, the extent to which the group is responsible for its collective actions, the extent to which the average member in the group is morally

## Group and Individual Mind

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3 responsible for its own individual actions, the extent to which the average member of the  
4 group is morally responsible for the group's collective actions, and how hierarchical each  
5 group is (1=not at all, 7=very much). Participants also rated how cohesive each group is  
6 (1=not at all, 7=very much), revealing the manipulation was effective,  $F(2, 60)=51.60, p<$   
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.0001. This measure of cohesion served as a manipulation check only, and all subsequent analyses treat groups as high-cohesion, moderate-cohesion, and low-cohesion based on the group descriptions that served as the manipulation. For each measure, we computed a high-cohesion group score, a moderate-cohesion group score, and a low-cohesion group score by averaging scores for each of the four groups per type, in both conditions.

At the end of the study, participants indicated whether they ever belonged to any of the groups mentioned. Seven participants reported belonging to at least one, but including group membership as a factor in our analyses did not meaningfully affect results<sup>ii</sup>.

### Results and Discussion

A 3 (manipulated cohesion: high-cohesion vs. moderate-cohesion vs. low-cohesion) X 2 (measure: group mind vs. member mind) ANOVA yielded an interaction,  $F(2, 60)=23.96, p<.0001$ , demonstrating the same tradeoff as in Studies 1 and 2. Specifically, attributions of group and member mind differed within high-cohesion ( $t(61)=2.91, p<.01$ ) and low-cohesion ( $t(61)=10.63, p<.001$ ) groups; participants attributed more group mind,  $t(61)=5.84, p<.0001$ , and less member mind,  $t(61)=3.58, p=.001$ , to high-cohesion versus low-cohesion groups<sup>iii</sup>. Judgments of group mind for moderate-cohesion groups differed from judgments of group mind for high- and low-cohesion groups, and judgments of member mind for moderate-cohesion groups differed significantly from judgments of member mind for high-cohesion groups (all  $p's<.05$ , see

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3 Table 2 for all descriptive statistics).  
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6 Participants also attributed more responsibility to the high-cohesion (versus low-  
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8 cohesion) groups for its collective actions,  $t(61)=6.88$ ,  $p<.0001$ , more responsibility to  
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10 the average high-cohesion (versus low-cohesion) group member for the group's  
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12 collective actions,  $t(61)=5.81$ ,  $p<.0001$  (see Figure 2). Judgments of individual  
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14 responsibility for individual actions did not differ significantly across groups ( $p>.26$ ),  
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16 replicating the results of Study 2. Also, hierarchy did not vary systematically across  
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18 groups.  
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22 In sum, high-cohesion groups, versus low-cohesion groups, elicited higher group  
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24 mind and lower member mind judgments. Mind judgments corresponded to responsibility  
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26 judgments: high-cohesion versus low-cohesion groups elicited greater judgments of  
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28 group and member responsibility for the group's collective actions, replicating the pattern  
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30 observed in Study 2. These findings emerged for judgments of high- and low-cohesion  
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32 groups even though cohesion was manipulated (rather than simply measured) across  
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34 conditions while holding groups constant.  
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38 Study 4 sought to extend these findings by manipulating cohesion in the absence  
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40 of verbal information about groups. Study 4 relied on novel, nonhuman groups and  
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42 manipulated group cohesion visually to further investigate the group-member mind  
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44 tradeoff and consequences for responsibility judgments.  
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#### 47 48 Study 4: Manipulating Group Cohesion Perceptually 49

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51 Study 4 replicates and extends the patterns of Studies 1-3 by manipulating group  
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53 cohesion through perceptual (versus conceptual) information. Studies 1-3 presented  
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55 verbal descriptions of established, human groups; thus, participants' preconceived  
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57 notions of these groups might have contributed to their judgments of group mind (though  
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## Group and Individual Mind

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3 this is less plausible for Study 3, in which groups were held constant, and group cohesion  
4 was manipulated). Study 4, however, relied on visual depictions of novel, nonhuman  
5 groups (i.e., fish). This approach enables us to test whether low-level perceptual  
6 features that provide cues to group cohesion might produce the same tradeoff as in  
7 Studies 1-3, and whether this tradeoff applies to relatively unfamiliar groups.

## Method

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17 *Participants.* Twenty-five people (12 male, 13 female,  $M_{age}=40.84$ ) completed the  
18 study online as in Studies 1-3.

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22 *Procedure.* Participants viewed two 44-second animated videos of fish (order  
23 counterbalanced). One video presented fish of the same size moving jointly that we  
24 referred to as fallfish (high-cohesion), whereas the other video presented fish of different  
25 sizes moving disjointedly that we referred to as silversides (low-cohesion; see Figure 3  
26 for a still from each video). After viewing each video, participants rated the extent to  
27 which the group of fish has a mind, the extent to which the average fish in the group has a  
28 mind, the extent to which the group of fish is responsible for its collective actions, the  
29 extent to which the average fish in the group is responsible for its own individual actions,  
30 and the extent to which the average fish in the group is responsible for the group's  
31 collective actions (1=not at all, 7=very much). Each question referred to the fish's species  
32 name. Participants also rated how cohesive each group is (1=low cohesion, 7=high  
33 cohesion), revealing that the manipulation was effective,  $t(24)=9.82, p<.0001$ .

## Results and Discussion

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53 A 2 (cohesion: high-cohesion vs. low-cohesion) X 2 (measure: group mind vs.  
54 member mind) ANOVA yielded an interaction,  $F(1, 24)=25.26, p<.0001$ , demonstrating  
55 the same tradeoff as in Studies 1-3 (see Table 1). More specifically, attributions of group  
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3 and member mind differed for both high-cohesion ( $t(24)=3.48, p<.01$ ) and low-cohesion  
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5 ( $t(24)=3.62, p=.001$ ) groups; participants attributed more group mind,  $t(24)=2.51, p<.02$ ,  
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7 and less member mind,  $t(24)=5.91, p<.0001$ , to high-cohesion versus low-cohesion fish.  
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10 Participants also attributed more responsibility to the high-cohesion group for its  
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12 collective actions,  $t(24)=4.04, p<.0001$ , more responsibility to the average high-cohesion  
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14 group member for the group's collective actions,  $t(24)=3.33, p<.01$  and in turn *less*  
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16 responsibility to the average high-cohesion group member for its *individual* actions,  
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18  $t(24)=6.29, p<.0001$  (see Table 1 for all descriptive statistics).  
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22 As in Studies 1-3, high-cohesion groups, versus low-cohesion groups, elicited  
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24 higher group mind and lower member mind judgments. Replicating Studies 1-3, mind  
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26 judgments also corresponded to responsibility judgments: high-cohesion versus low-  
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28 cohesion groups elicited greater attributions of group and member responsibility for the  
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30 group's collective actions. Notably, members of high-cohesion groups were also judged  
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32 as less responsible for their *own individual* actions.  
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### 36 General Discussion

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38 The present research reveals a novel tradeoff in attributions of mind: the more  
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40 people judge a group to have a mind, the less they judge a member of that group to have a  
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42 mind, and vice versa. Attributing more mind to the group is linked to judging the  
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44 group—and its members—to be more responsible for the group's collective actions.  
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48 We discuss three possible accounts for this tradeoff that future research can test  
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50 more definitively. First, cohesion may simply have separable and opposite effects on  
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52 judgments of group and member mind—a cohesive group indicates a single-minded  
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54 group, whereas a diverse group indicates the presence of independently-minded  
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56 members. Second, an “economy of mind” may exist such that perceivers are capable of  
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## Group and Individual Mind

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3 attributing only a finite amount of mind to any social being or structure—attributing mind  
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5 to a group might diminish the amount of mind that one can attribute to a group member  
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7 and vice versa. A third, related possibility is that the tradeoff results from a lack of  
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9 motivation in the attributional process. That is, once a perceiver identifies a mind as the  
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11 cause of the group's actions—be it the group itself or a particular member—the perceiver  
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13 becomes less motivated to seek and identify an additional source of mind. Given that  
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15 inferring mind requires motivation and cognitive resources (Apperly, Riggs, Simpson,  
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17 Chiavarino, & Samson, 2006; Epley, Keysar, Van Boven, & Gilovich, 2004; Lin, Keysar,  
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19 & Epley, 2010), attributing mind to one entity (group or group member) might sap the  
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21 cognitive capacity and motivation to attribute mind to an additional entity.  
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27 *Is the tradeoff an error?*  
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29 The present findings may be counterintuitive in light of existing research on the  
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31 relationship between the actual (rather than attributed or perceived) mental states of  
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33 groups and group members. This literature demonstrates that group and member mind are  
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35 often uncorrelated as in the case of the dissociation between group and group member  
36  
37 intelligence (Woolley, Chabris, Pentland, Hashmi, & Malone, 2010), the discontinuity  
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39 between group and individual hostility (Wildschut, Pinter, Vevea, Insko, & Schopler,  
40  
41 2003), or even the dissociation between between group-based emotions like collective  
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43 guilt and feelings of personal guilt (Doosje, Branscombe, Spears, & Manstead, 1998).  
44  
45 Other research demonstrates a relationship between group and member mind, but a  
46  
47 *positive* one, in contrast to the relationship observed here. These studies demonstrate that  
48  
49 group memory capacity correlates with the memory capacity of a specific group member  
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51 (Weldon & Bellinger, 1997), individual consumer preferences correlate with collective  
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53 preferences (Goel, Hoffman, Lahaei, Pennock, & Watts, 2010), and American  
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3 individuals' self-reported mood states on Twitter predict the mood (i.e., success) of  
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5 national economic markets (Bollen, Mao, & Zeng, 2011). This body of literature  
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7 therefore suggests either a null or a positive relationship between the actual mental  
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9 capacities of groups and group members. Future research should therefore investigate  
10  
11 whether the group-member mind tradeoff observed here represents an error.  
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#### 14 15 *Implications*

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17 The present findings have three major implications for how people think about the  
18  
19 minds of groups and group members. First, attribution of mind to groups and group  
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21 members affects ethical judgment and decision-making. The extent to which people  
22  
23 consider a group to be a cohesive unit with a collective mind increases the donation of  
24  
25 resources (Bartels & Burnett, 2010), distribution of rights (e.g., property ownership), and  
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27 attribution of predatory qualities (Gao, McCarthy, & Scholl, 2010) to that group. The  
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29 present research contributes to our understanding of the conditions under which these  
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31 phenomena occur and the implications of these phenomena for both groups and group  
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33 members. Indeed, future research should examine whether the *types* of minds (Gray et  
34  
35 al., 2007) attributed to groups influence the moral evaluation and treatment of those  
36  
37 groups. Groups vary on the extent to which they are stereotyped as interpersonally  
38  
39 warm and competent (Cuddy, Fiske, & Glick, 2007), factors that influence how target  
40  
41 groups are treated. For example, people are less likely to purchase products from not-  
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43 for-profit corporations versus for-profit corporations because they infer that non-profits  
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45 are warm, yet incompetent (Aaker, Vohs, & Mogilner, 2010). Ascriptions of specific  
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47 mental characteristics (e.g., personal beliefs and intentions) to various groups may also  
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49 affect the moral treatment of these groups (O'Laughlin & Malle, 2002).  
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58 Second, this research informs the psychology behind legal decisions such as those  
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## Group and Individual Mind

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3 regarding corporate personhood (which entails group mind) or the charge of conspiracy  
4 (which requires collective intent amongst multiple individuals) (Malle, 2011). In another  
5 recent Supreme Court case, Wal-Mart was charged with discriminating against female  
6 employees in the largest class-action case in U.S. history (Dukes v. Wal-Mart Stores Inc.,  
7 2011). The Supreme Court ruled in favor of Wal-Mart, stating that the plaintiffs (female  
8 employees) were too varied in their circumstances for them to constitute a class, although  
9 Wal-Mart as a defendant was allowed to represent itself as a unified entity. This case  
10 demonstrates the effect of group cohesion on judgments of mind (and hence legal rights)  
11 for groups and group members. Understanding the implications of the group-member  
12 mind tradeoff in the legal domain will be another important topic for future investigation.  
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27 Finally, this research sheds light on the psychology of dehumanization (Bandura,  
28 Underwood, & Fromson, 1975; Haslam, 2006) whereby people reduce individual persons  
29 to mindless entities in a faceless mass. The inverse relationship between group and  
30 member mind suggests that perceived group cohesion should predict a willingness to  
31 dehumanize individual members of that group. Determining how attributions of mind  
32 operate across group boundaries as well as the cues that modulate these attributions  
33 (Looser & Wheatley, 2010; Morewedge, Preston, & Wegner, 2007) will be important as  
34 well. This research can help explain how people justify hostility toward large collectives  
35 and how people come to treat members of groups as unique individuals.  
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## Group and Individual Mind

Table 1. Qualitative summary of results, Studies 1-4.

Study	Results
Study 1	Group mind correlated negatively with member mind and positively with group cohesion. Member mind correlated negatively with group cohesion.
Study 2	Group mind correlated negatively with member mind and positively with cohesion, individual responsibility for collective actions, and collective responsibility for collective actions. Member mind correlated negatively with cohesion, individual responsibility for collective action, and collective responsibility for collective action.
Study 3	High-cohesion groups were seen as higher on group mind, cohesion, individual responsibility for collective action, collective responsibility for collective action, and lower on member mind than low-cohesion groups.
Study 4	The high-cohesion fish were seen as higher on group mind, cohesion, individual responsibility for collective action, collective responsibility for collective action, and lower on member mind and individual responsibility for individual action than the low-cohesion fish.

Only

Table 2: Average responses by group type (Study 3)

Dependent Measure	High-Cohesion Groups	Moderate- Cohesion Groups	Low-Cohesion Groups
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Group mind	4.48 <sub>a</sub> (1.85)	3.59 <sub>b</sub> (1.28)	3.15 <sub>c</sub> (1.71)
Member mind	5.43 <sub>a</sub> (1.39)	5.89 <sub>bc</sub> (1.07)	6.05 <sub>c</sub> (1.28)
Group responsibility for group actions	5.16 <sub>a</sub> (1.49)	4.25 <sub>b</sub> (1.40)	3.89 <sub>c</sub> (1.52)
Member responsibility for member actions	5.87 <sub>a</sub> (1.19)	5.95 <sub>a</sub> (1.13)	6.04 <sub>a</sub> (1.23)
Member responsibility for group actions	4.49 <sub>a</sub> (1.42)	4.13 <sub>b</sub> (1.27)	3.38 <sub>c</sub> (1.32)
Cohesion	5.77 <sub>a</sub> (1.19)	4.22 <sub>b</sub> (1.14)	3.43 <sub>c</sub> (1.41)
Hierarchy	3.57 <sub>ab</sub> (1.62)	3.58 <sub>a</sub> (1.31)	3.29 <sub>b</sub> (1.49)

Means in each row that do not share a subscript differ from each other,  $p < .05$ .

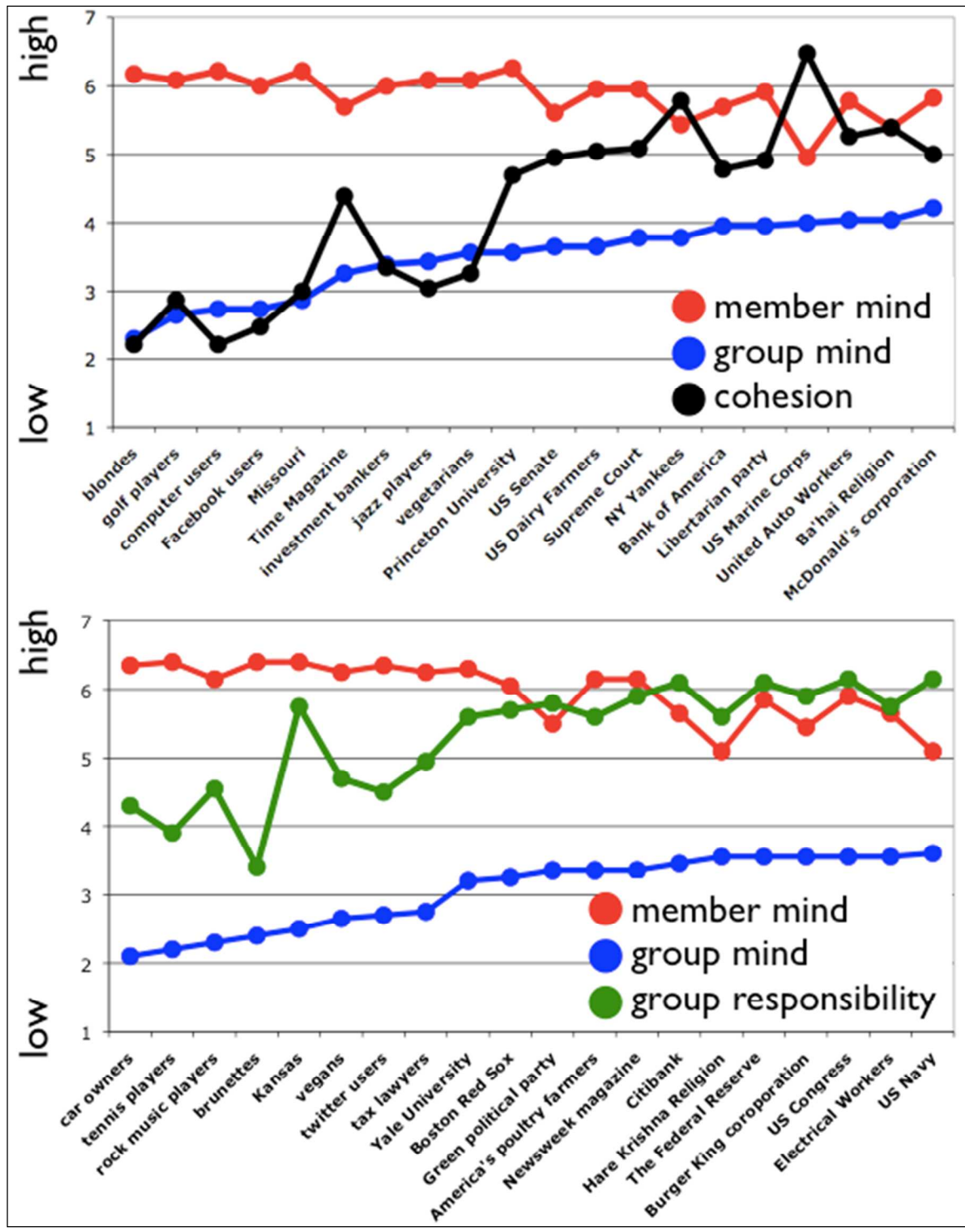
## Group and Individual Mind

Table 3: Average responses by group type (Study 3).

Dependent Measure	High-Cohesion Fish	Low-Cohesion Fish
	<i>M (SD)</i>	<i>M (SD)</i>
Group mind	4.72 (2.25)	3.36 (2.08)
Member mind	2.52 (1.78)	5.16 (1.91)
Group responsibility for group actions	5.28 (2.05)	3.36 (1.98)
Member responsibility for member actions	2.80 (1.78)	5.44 (1.78)
Member responsibility for group actions	4.16 (2.17)	2.68 (1.60)
Cohesion	6.44 (1.00)	3.44 (1.73)

Means in each row differ from each other,  $p < .05$ .

Figure 1. Results from Study 1 (top) and Study 2 (bottom).



Group and Individual Mind

Figure 2. Study 3 ratings of member mind, group mind, and group responsibility for low-cohesion, moderate-cohesion, and high-cohesion groups.

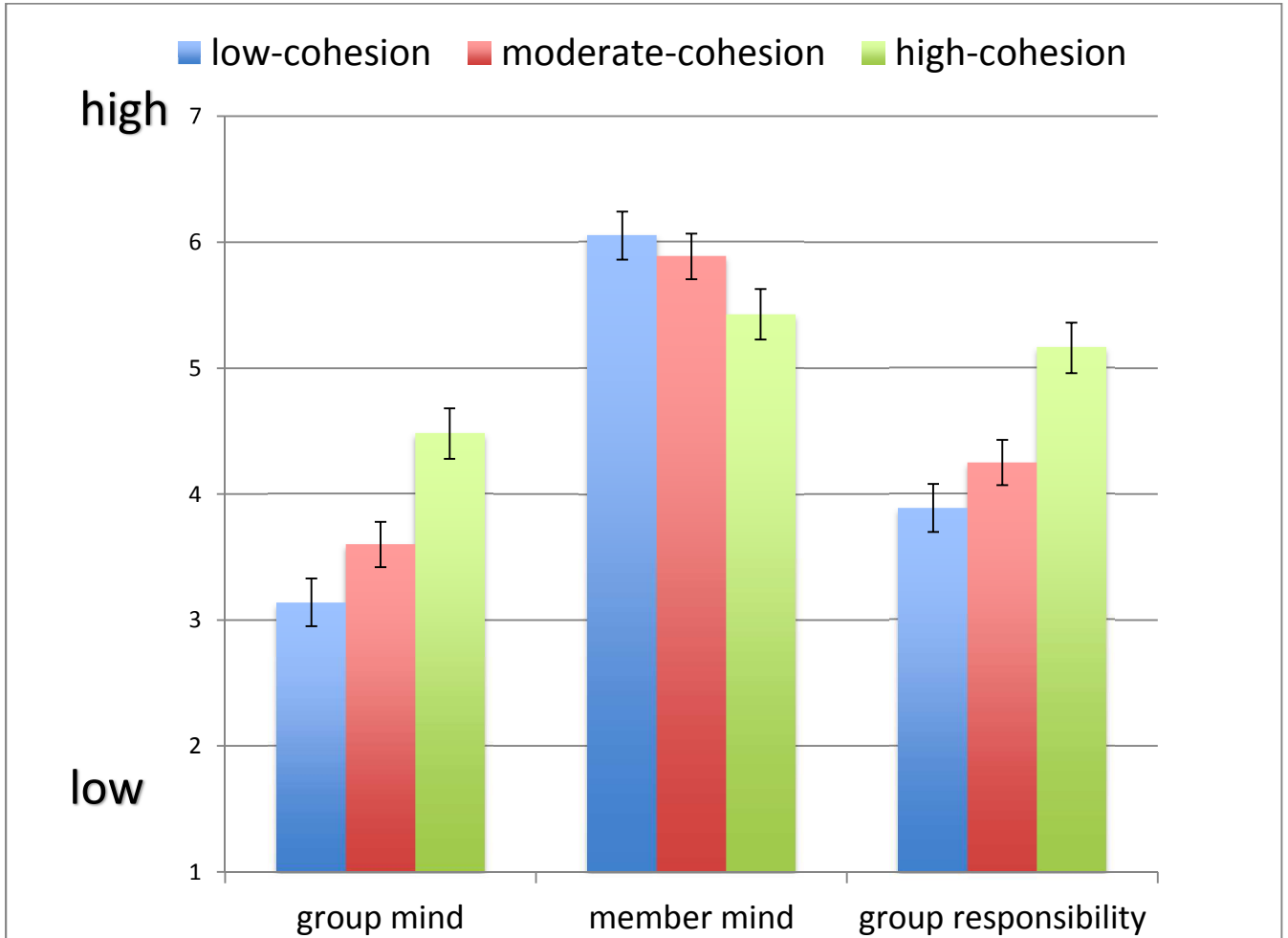
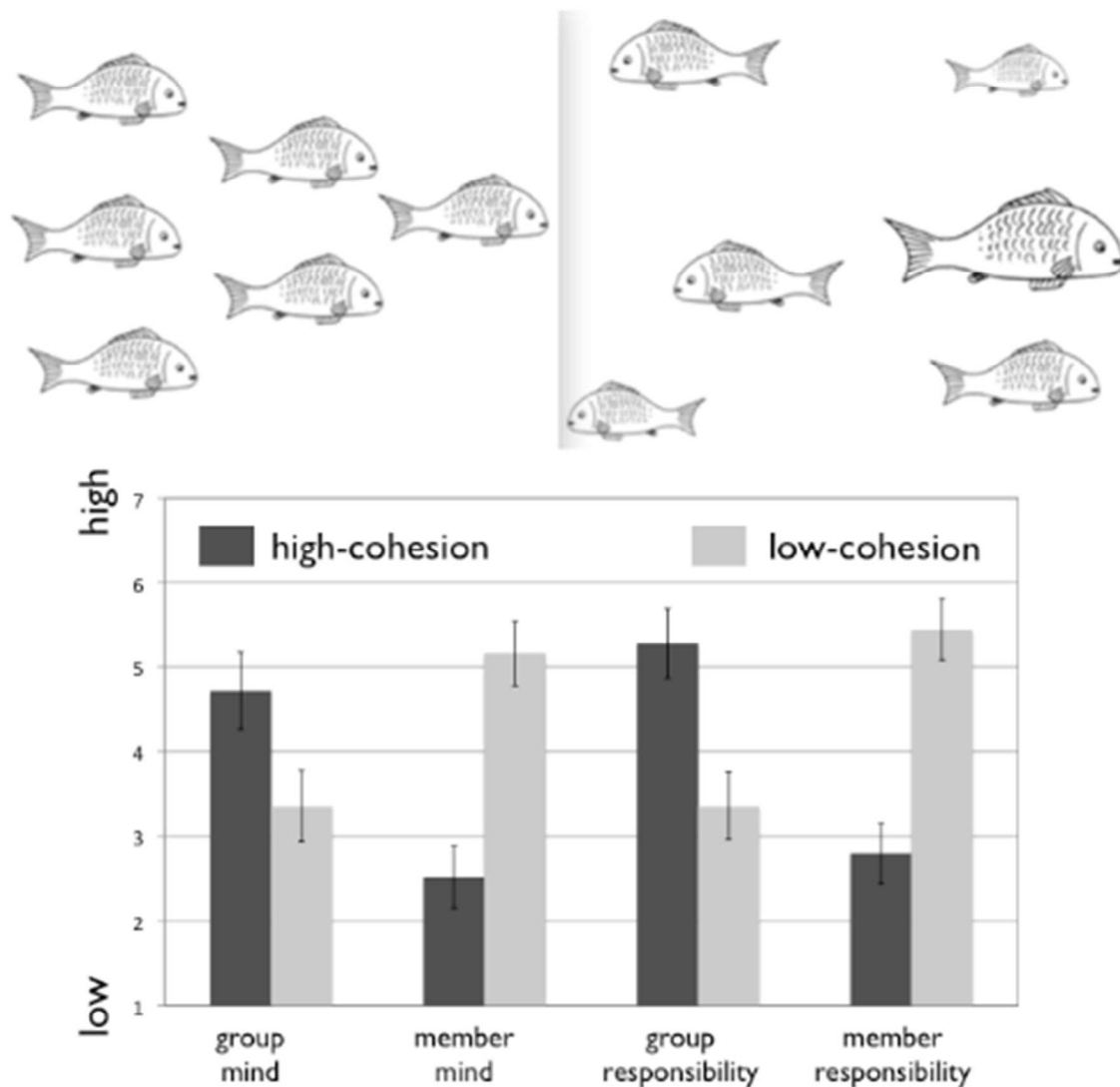


Figure 3. Screenshots from each video, Study 4 (top). Note. *Left*: high-cohesion fish. *Right*: low-cohesion fish. Study 4 results (bottom).



<sup>i</sup> See <https://sites.google.com/site/groupindividualmind> for all materials from all studies.

<sup>ii</sup> A 2 (group membership: yes or no) X 3 (manipulated cohesion: high-cohesion vs. moderate-cohesion vs. low-cohesion) X 2 (measure: group mind vs. member mind) ANOVA yielded the same cohesion X measure interaction,  $F(2, 59)=10.43, p<.0001$ , and membership did not interact with any other factors significantly.

<sup>iii</sup> We also computed average group member mind ratings for the eight groups described in high-cohesion and low-cohesion terms to conduct a 2 (condition: A vs. B.) X 2 (measure: group mind vs. member mind) X 12 (group cluster: [jazz, chess, karate, improv] vs. [model UN, ballroom, singers, drama]) mixed ANOVA. This revealed a three-way interaction,  $F(1, 6)=263.59, p<.0001$ , reflecting the same pattern of results and again demonstrating the group-member mind tradeoff.