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Keywords

Group-serving bias, causal attribution, divergent thinking, decision making, knowledge exchange

Comments

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Causal Attributions and the Quality of Group Decision Making

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Abstract

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Causal Attributions and the Quality of Group Decision Making

A long stream of research in attribution theory suggests that groups are biased toward attributing their success to factors that are internal to their group. However, the existing research has confounded two types of attributions that are both internal to the group, but theoretically distinct: (1) Attributions that differentiate between the contributions made by each individual group member and (2) attributions that focus on the group as a whole. This dichotomy is important because, drawing on theories of social influence, we predict that different types of attributions will have different consequences for the quality of group decision making. In experiment 1, individually focused attributions for past success caused groups to consider more divergent alternatives prior to making a shared decision. In experiment 2, individually focused attributions for past success facilitated the sharing of unique information and improved decision accuracy. These findings suggest that the group serving tendency to internalize success may have important consequences for group performance that have not yet been considered in current research.

Key words: Group-serving bias, causal attribution, divergent thinking, decision making, knowledge exchange

Introduction

One of the most robust findings in attribution theory is the self-serving bias: People take personal credit for their success and attribute failure to external circumstances (Gioia & Sims, 1985; Kingdon, 1967; Zuckerman, 1979). Although a simple description of this bias would probably elicit a knowing nod of recognition from most people, the implosion of the Enron Corporation provides a dramatic illustration. When Enron was an unqualified success, CEO Kenneth Lay eagerly took his share of the credit, “I was always on the forefront of trying to make sure that our people did in fact live and honor those values---respect, integrity, excellence” (Gruley & Smith, 2002). His story changed drastically when seated at a congressional hearing. According to Lay, he was “duped” by those closest to him and he had no knowledge of the impending scandal (Hays, 2004).

Much like individuals, there is increasing evidence that groups (Forsyth & Schlenker, 1977) and even organizations (Salancik & Meindl, 1984; Staw, McKechnie & Puffer, 1983) display a similar tendency to take credit for success and attribute failure to their external environment (see also Johns, 1999). This tendency has been called a group-serving bias (Forsyth & Schlenker, 1977)¹. For instance, members of sports teams will often attribute team failure to external circumstances such as bad luck, but attribute success to internal factors such as team cohesiveness (Zaccaro, Peterson & Walker, 1987).

Although current research has not yet established the pervasiveness of the group-serving bias in performance attributions, it should be especially recurrent in organizational settings where people are being asked to spend more and more of their time working in groups (Ilgen, 1999; Naquin & Tynan, 2003). In fact, groups have permeated all types of organizations to such an extent that one would be hard pressed to find one that does not describe itself as being “team

based” (Locke, Tirnauer, Roberson, Goldman, & Weldon, 2000). Given the widespread emphasis on teamwork, it is likely that the locus of attribution will more frequently shift from the individual level to the group level. In other words, people must not only explain why they personally succeeded or failed, but they must also more often explain the successes and failures of the groups to which they belong.

While it might be expedient to generalize from the significant body of research on the self-serving bias (Kingdon, 1967; Miller & Ross, 1975) directly to the group level (Johns, 1999) the complexity and sheer variety of possible attributions internal to the group make cross-level comparisons potentially misleading. The self and group serving biases may appear equivalent on the surface because failure is attributed to external factors at both levels and factors external to both groups and individuals can be described along the same terms (e.g. We/I had bad luck). However, unlike factors internal to the individual, causal factors internal to the group are frequently shared by more than one person (Newman, 1981), are emergent products of social interaction (Sherif, 1935) and are therefore irreducible to the individual level (McGrath, 1964). In other words, the experience of success triggers internal attributions that are conceptually distinct from those generated to explain success at the individual level.

In this paper, we propose a theoretical framework in which factors internal to the group are broken down into two distinct types of attributions: (1) Attributions that differentiate between the contributions made by each individual group member and (2) attributions that focus on the group as a whole. This framework is potentially important because different types of internal attributions may give rise to different performance outcomes. Drawing on and extending existing research that proposes a link between causal attributions and convergent thinking in groups (Goncalo, 2004), we argue that different types of attributions may have different

consequences for the quality of group decision making. We present evidence from two experiments suggesting that individually focused attributions for success can stimulate groups to consider a broader range of alternatives prior to making a shared decision, to facilitate the communication of unique information and to improve decision accuracy when critical information is unshared. We conclude by discussing the broader implications of these findings for the potential link between causal attributions and subsequent group performance.

The Whole or the Parts?: Two Types of Attributions Internal to the Group

Groups, like individuals, take credit for their success by attributing it to internal as opposed to external factors (Forsyth & Schlenker, 1977). The tendency to attribute success to internal factors allows the entire group to share in and experience the positive emotions associated with success (Cialdini, Borden, Thorne, Walker, Freeman & Sloan, 1976) thereby increasing group cohesion and camaraderie (Taylor & Tyler, 1986). Conversely, by attributing failure to external factors, the group is able to maintain a positive identity even in the face of difficulties (Cialdini & Richardson, 1980). People who explain failure by pointing to the group (We can't work together) or to specific members of the group (Joe missed the deadline) risk being ostracized, even if their criticisms are accurate (Taylor & Tyler, 1986). To avoid uncomfortable accusations, failure at both the individual and group levels is typically attributed to external and often uncontrollable factors such as time pressure, luck or task difficulty (Johns, 1999; Weiner, 1985). However, while there is general agreement that external attributions are equivalent for both groups and individuals (Johns, 1999), unanswered questions remain about which factors internal to the group may become the target of a group's causal attributions (Zaccaro, et al., 1987).

At the heart of this question is the larger question of what a group is and how people describe their group to others. Almost from the inception of psychological research on groups, there has been a debate between theorists who argued that a group is merely the sum of its individuals (Allport, 1924) and those who believe that a group has certain collective attributes that can be understood only by viewing the group as a coherent whole (LeBon, 1895). LeBon (1895) famously called such collective attributes the “group mind” but was later ridiculed by others who accused him of falling prey to an anthropomorphic fallacy (Allport, 1924). According to Allport (1924) the concept of the group was merely a convenient but inaccurate shortcut for describing a collection of attributes that originated in individuals. Subsequent theorists such as Sherif (1936), Asch (1952) and Lewin (1952) noted Allport’s critique of the “group mind” but they also asserted that groups have unique properties that emerge as individuals interact with one another (Brown, 1988). For example, Lewin’s (1952) field theory paved the way for subsequent research on group dynamics by noting that groups attain a reality apart from the individuals who compose it through a sense of shared fate and task interdependence.

These competing perspectives were eventually synthesized into complimentary descriptions of groups, each telling only part of the story. For instance, McGrath (1964) incorporated the classical distinction between individuals and groups into his influential input-process-output model of group behavior. McGrath (1964) posited that there are three categories of factors that influence how a group interacts with one another. He divided these input factors into (a) individual level factors, (b) group level factors, and (c) environmental level factors. According to McGrath, individual level factors describe each member of the group. In contrast,

group level factors are, by definition, shared and therefore cannot be reduced to the individual level.

The idea that group outputs may be driven by both group and individual level inputs is important because it offers a clue as to how people might attribute the causes of their own group's performance. Drawing on McGrath's (1964) framework, the experience of success may trigger attributions that are internal to the group (Zaccaro et al., 1987) but such attributions may describe either individual level or group level factors. Although no direct evidence for this distinction exists in research on group attributions, there is strong evidence for this distinction in research on attributions that occur in close relationships (e.g. between married couples) (Newman, 1981). As a couple interacts with each other over a period of time, their relationship itself develops distinct emergent properties that exist apart from the properties of any one partner (Bradbury & Fincham, 1990). Therefore, in a relationship, causality may be ascribed to the relationship itself by referring either to the relationship as a unit (i.e. we have chemistry) or to each person in the partnership (i.e. he is considerate, she is understanding) (Fletcher & Fincham, 1991; Newman, 1981).

The research on attributions on close relationships, combined with the history of research on groups, converges on the crucial distinction between attributions focused on individuals versus the group as a whole. In other words, translated from the dyad to the group level, past success triggers attributions that are internal to the group and these attributions may describe either the contributions made by each individual in the group (i.e. John is knowledgeable, Jane is persistent, Joe is cooperative) or by describing the group as a unit (we are cohesive).

Do different types of attributions have different consequences?

In current research, causal attributions are typically assumed to arise as a consequence of a prior performance outcome; a group first experiences success or failure and then strives to understand its cause (Staw, 1975; Forsyth & Schlenker, 1977; Zaccaro, et al., 1987). In this paper we carry this sequence of events one step further by arguing that attributions for past performance may themselves be an independent cause of a group's subsequent performance. More specifically, success triggers different types of internal attributions that may in turn have different consequences.

Existing research suggests that an important consequence of individually focused attributions for past success may be a subsequent ability to generate divergent solutions to a problem (Goncalo, 2004). Divergent thinking is defined as thinking that moves outward from a problem in many possible directions (Mayer, 1992). Goncalo (2004) found that groups who attributed their success to the unique contributions made by individual members subsequently generated significantly more ideas that were more divergent than the ideas generated by groups who attributed their success to the shared properties of the group as a whole.

If individually focused attributions for success stimulate divergent thinking, then there may be considerable implications for group performance across a variety of domains. One domain in which divergent thinking is particularly relevant is for the quality of a group's decision making process. Groups make higher quality decisions when they thoroughly explore a wide range of alternatives prior to reaching consensus on a particular course of action (Nemeth & Rogers, 1996) while the tendency to avoid a thorough exploration of alternatives is an indicator of groupthink (Janis, 1971). Groups with a dysfunctional decision making process either fail to consider alternatives (Janis, 1982) or they consider alternatives that follow a similar

theme by searching for information that will confirm their point of view (Jonas, Schulz-Hardt, Frey & Thelen, 2001). By stimulating decision making groups to think divergently, individually focused attributions may benefit groups by facilitating the exploration of alternatives prior to reaching a consensus.

The differential effects of individual and group focused attributions found in previous research may, however, be more likely to emerge following success than following failure. Both groups and individuals tend to attribute failure to external factors and the content of external attributions for performance is identical for both groups and individuals (Zaccarro et al., 1987). Because both individuals and groups can attribute failure to the same set of external factors such as time pressure, bad luck or task difficulty then it follows that the consequences externalizing failure might also be identical at both levels (Johns, 1999). In addition, groups and individuals tend to, “avoid, ignore, distort and forget negative feedback” which should mute the consequences of such feedback on subsequent behavior (Johns, 1999: pg. 16; Taylor & Brown, 1988; Audia & Brion, 2007). In other words, the tendency of individuals and groups to deflect failure by externalizing it should weaken the effects of attributions on subsequent behavior.

Therefore, we predict the following:

Hypothesis 1: There will be an interactive effect of attributions (to the group versus to the individuals) and past performance (success versus failure) on the number and variety of alternatives considered prior to making a shared decision. Groups that attribute their performance to specific individuals will consider a wider range of alternatives than will groups that attribute their performance to the group as a whole when the group succeeds but not when the group fails.

Existing research suggests that individually focused attributions for success should stimulate groups to generate divergent solutions (Goncalo, 2004) however, the psychological mechanisms that give rise to this effect have not yet been tested. Here, we build upon this research by exploring two avenues through which attributions for past success might impact the

willingness to consider alternatives. One possibility is that attributing success to the group as a whole may send a subtle but important message: Each member's contributions are neither identifiable nor separable from their teammates. Research on social loafing suggests that people are less willing to exert effort on behalf of their team when they do not feel that their contributions to the group are identifiable (Williams, Harkins & Latane, 1981). The temptation to free-ride on the efforts of others is often invoked as an explanation for the consistent finding that face-to-face groups generate fewer creative ideas than individuals who work alone (Diehl & Strobe, 1987). In order to explore a wide range of alternatives, a group must focus their attention on a broad range of information (Kasof, 1997), and ultimately search for new solutions that extend beyond an existing train of thought (Mednick, 1962). Groups who lack the motivation to search beyond the most obvious solution to a problem are unlikely to generate divergent solutions (Amabile, 1983). In contrast, attributions for success focused on individual group members may boost feelings of accountability to the group defined as "the implicit or explicit expectation that one may be called on to justify one's beliefs, feelings and actions to others" (Lerner & Tetlock, 1999: pg. 255). When people anticipate that they will be held individually accountable for their actions they exert more cognitive effort by seeing an issue from multiple perspectives (Lerner & Tetlock, 1999). Therefore, we predict:

Hypothesis 2a: Groups who attribute their success to specific individuals will exert more effort on shared tasks than will groups who attribute their success to the group as a whole.

Hypothesis 2b: Task effort will mediate the relationship between type of attribution for success and the consideration of alternatives.

A second possible mechanism that was proposed in earlier research (Goncalo, 2004) is that group focused attributions may increase conformity pressure by emphasizing that success was caused by the collective effort of a group of individuals whose contributions were

indistinguishable from one another. When people are faced with a unanimous majority, they will often ignore the evidence of their own senses and adopt the majority position even when it is obviously incorrect (Asch, 1956). This pressure to conform originates from the desire to be liked by others (Deutsch & Gerard, 1955) and the tendency of groups to reject those who do not fit (Schachter, 1951). A long tradition of research on social influence has shown that one of the most powerful ways to create conformity pressure is by calling attention to what the majority of people are doing in a given situation (Asch, 1956; Cialdini, Reno & Kallgren, 1990). This principle was illustrated more recently in a series of studies showing that conformity to a group norm increases substantially by simply making the norm salient to people (Cialdini, et al., 1990). Applied to attributions, this research suggests that explanations focused on the group as a whole (e.g. we are cooperative) make salient how most people behaved prior to a successful outcome, thus creating pressure to conform to their behavior in a subsequent setting. In contrast, attributions that link group success to individual achievement permit the possibility that people can stand out by making their own unique contributions (Beersma & DeDreu, 2005; Goncalo & Staw, 2006) thus lowering pressures to conform to the group.

While a certain level of conformity pressure is necessary for a group to accomplish its goals (O'Reilly & Chatman, 1996), it may cause the group to perform poorly on tasks that require a group to generate new and different ideas (Peterson & Nemeth, 1996). Conformity pressure, by suppressing dissenting opinions, prevents people from reflecting on and possibly reconsidering their own views (Nemeth, 1986). Excessive pressure toward agreement may prevent people from diverging from a common line of thought to consider multiple different perspectives on an issue (De Dreu & De Vries, 1996; Nemeth & Rogers, 1996). Consequently, the group tends to view a problem from only one narrow perspective and to ultimately come up

with less divergent solutions (Schulz-Hardt, Frey, Luthgens & Moscovici, 2000). Therefore, we predict:

Hypothesis 3a: Groups that attribute their success to specific individuals will experience less conformity pressure than will groups that attribute their success to the group as a whole.

Hypothesis 3b: Conformity pressure will mediate the relationship between type of attribution for success and the consideration of alternatives.

Experiment 1

Method

Participants and design

One hundred and sixty-eight undergraduate students at a large public university in an introductory course on Organizational Behavior participated in the study in exchange for course credit. The sample consisted of 54% males, 46% females, 53% Asians, 17% European-Americans, 9% East Indians, 3% Hispanics, and 2% African-Americans. The remaining participants chose not to identify their ethnicity. Almost 90% of the sample had taken at least one business course and on average had completed a total of 3 business courses prior to participating in the study. The study was a 2 (Attribution: Individual Focus versus Group Focus) x 2 (Feedback: Positive versus Negative) factorial design. Groups of three people were randomly assigned to each of the four conditions resulting in 14 groups per condition and a total of 56 groups.

The study was divided into 3 phases. In the first phase, each group completed an estimation problem (Alpert & Raiffa, 1969) that provided the basis for false feedback about their performance. In the second phase, each group was given false feedback about their performance and was asked to attribute their performance to either the individuals in their group or to the group as a whole. Finally, in the third phase, each group completed a decision making task that

was designed to assess the extent to which groups explored a wide range of alternatives prior to reaching a consensus.

Decision case

The decision task used in the study was based on facts drawn from the 2002 merger between Hewlett-Packard and Compaq. The proposed merger, worth approximately 25 billion dollars, was extremely controversial and a great deal of evidence was gathered both for and against the deal. On one side was Hewlett-Packard's then new CEO Carleton Fiorina, who was strongly in favor of the merger. Fiorina viewed the merger as an opportunity to capitalize on potential synergies between Hewlett-Packard and Compaq. By merging with Compaq, the new firm would immediately become number one in the enterprise storage industry with 2 billion dollars in the first full year of operation. On the other side was Bill Hewlett, a descendant of the founder and a vigorous defender of the firm's longstanding core values. According to Hewlett, the merger would increase HP's exposure to a declining PC industry, dilute their traditional focus on printers, and cost the firm billions to integrate with Compaq. However, despite these misgivings, the merger was ultimately approved by the shareholders.

Each experimental group was asked to consider the facts of the merger and decide as a group, whether to merge or not to merge with the other firm. Divergent thinking was measured by the number and diversity of alternatives to the merger each group considered prior to making their final decision.

Procedure

Phase 1: Providing the basis for performance feedback

All students were seated and asked to remain quiet until the experiment began. There were three seats at the table, and each spot was labeled "A", "B" or "C". Once all the subjects

arrived, they were asked to read and sign a letter of informed consent. All participants were then told that in this study the experimenter was interested in how groups interact to solve difficult problems. Their first task would be a problem that will ask them to, as a group, estimate 10 unknown quantities (Alpert & Raiffa, 1969). For instance, each group was asked to estimate the average salary of a public school teacher in California (the state in which the study was conducted) and then to discuss and agree on an upper and lower bound around their shared estimate such that they were 98 percent sure that the range surrounded the actual quantity. Each group was told that an answer would be counted as wrong if the correct quantity fell outside of their upper and lower bound. They were also told that their group would be evaluated on how well they answered these questions compared to other groups who had performed the same task in previous studies. Finally, each group was given ten minutes to read the instructions and solve the problem as a group. The experimenter then asked one person if they would write down their group's solutions. To rule out any potential effect of the seating arrangement, the experimenter always handed the worksheet to the person who was randomly placed in seat "A."

Phase 2: Performance feedback & attribution manipulation

After ten minutes elapsed, the experimenter returned to the room and collected the answer sheet. All the groups were told that the experimenter would return, but he would first need to check their answers before they could continue. Upon returning to the room, the groups who were to receive positive feedback were told that their group did well above average. They were also told that their group was able to correctly estimate more quantities than most groups were able to do in previous studies. Groups in the negative feedback conditions were told instead they their group did well below average. They were also told that their group was unable to correctly estimate as many quantities as most groups had been able to do in previous studies.

After receiving their performance feedback, all groups were then told that in order for the experimenter to understand their group better, they must answer the following question as a group:

“What are the qualities of (*your group/the individuals in your group*) that you believe led to your (*above/below*) average performance on the previous task.”

The question was written to direct the groups’ attributions toward the group as a whole or to the contributions made by each individual member. All groups were given 5 minutes to discuss their answer to the question as a group and the same person seated in seat “A” was again asked to record the group’s answer. Each group received a sheet on which to record their attributions. Groups in the individually focused condition received a sheet that was divided into three sections corresponding to each individual in the group (person A vs. B vs. C) to ensure that an attribution was made about each individual member. Groups in the group focused condition received a lined sheet that was not divided by individual.

Phase 3: Generating alternatives

Next, all groups were asked to participate in a study on group decision-making. The decision scenario was introduced as follows:

“It is February 2002. General Printer CEO, David Turner has called a meeting of several key personnel to discuss the feasibility of merging with PC Corporation. You are members of a high-level committee that will decide what the company should do. Your group will be developing a recommendation to be delivered to the company CEO, and the board. Toward the end of the meeting, your group will compose a written recommendation, together with supporting arguments, which you will hand to the experimenter. This potential merger has been very public, and extremely controversial. A great deal of evidence has been gathered on both sides of the issue. Your group has twenty minutes to, as a group, read and consider the information before you and then discuss the matter and reach a shared decision.”

The person in seat A was handed a packet with the instructions, one sheet of lined paper on which to record the group’s proposed alternatives, and a space in which they were required to

state their final decision of whether they were in favor or against the proposed merger. Each member of the group was also handed a packet with all of the evidence for and against the merger. There were 10 items of evidence in support of each position (for or against the merger) and the total word count was identical. For example, one piece of evidence in favor of the merger was that, "The cost savings created by the merger with PC Corporation have a net present value of \$5 to \$9 for each General Printer share." An example of one piece of evidence against the merger was that, "Analysts project that General Printer's stock price would increase by 14-17 US dollars per share if the merger were rejected." The evidence was culled from media coverage of the HP-Compaq (2002) merger (see CNET NEWS.COM). All of the study materials are available upon request.

Each group was instructed to first discuss and record all the potential alternatives to the merger. For instance, they could recommend that the CEO develop a joint venture with the rival firm instead of a merger, to merge with a different firm or to develop new technologies in-house. This part of the task was open ended and the number of alternatives listed in the entire sample ranged from one to twelve ($M = 5.36$, $s.d. = 1.97$). Each group then discussed the alternatives, debated the relative merits of merging versus not merging and reached consensus on a final decision. Each group had twenty minutes to complete the entire decision making exercise and each group decided how much time they should allot to each step (generating alternatives, discussing alternatives, reaching a consensus). All groups in this study took the entire 20 minutes to complete the exercise.

Dependent variables

Divergence of alternatives considered: We measured the extent to which groups considered a wide range of different alternatives prior to making shared decision using two indices that are

typically used to measure divergent thinking: Fluency and flexibility (Choi & Thompson, 2005; Guilford, 1956; Paulus & Yang, 2000). First, we counted the sheer number of alternatives generated by each group prior to making their shared decision (fluency). Second, we measured the divergence of the alternatives considered by each group prior to arriving at their decision (flexibility).

To assess flexibility, two coders who were blind to the conditions and hypotheses of the study were instructed to independently sort the entire sample of alternatives generated by all the groups in the study into categories containing ideas that were similar to each other (Larey & Paulus, 1999; Nijstad, Stroebe & Lodewijkx, 2002). For instance, all of the alternatives suggesting that General Printer should merge with a different firm were categorized together. Next, each coder counted the number of categories that were considered by each group. Since the coders showed significant agreement on the number of categories covered by each group ($r = .80, p < .01$) their ratings were averaged together ($\bar{M} = 3.93, s.d. = 1.35$; $\bar{M} = 4.30, s.d. = 1.58$). Groups who think divergently should generate alternatives that are less similar to one-another and therefore fall into a greater number of categories.

Measures of group process: One way that different types of attributions may influence convergent thinking is through the group's decision-making process or what the group is doing and how they are doing it (Weingart, 1997). As Weingart (1997) noted, most models of group performance (e.g. Hackman, 1987) incorporate group processes as a way of linking group inputs such as resources to group outputs such as the quantity or quality of ideas generated. Weingart (1997) advised that group processes should be measured directly by coding their interactions. Therefore, in line with these recommendations, we explored the potential mechanisms underlying the link between attributions and convergent thought by coding videotape data of

each group's discussion. The coding focused specifically on the twenty-minute interaction during which the group decided whether or not to merge or not to merge with the fictional company called PC Corporation. One group was dropped from the analysis due to a malfunction with the video equipment yielding 55 groups.

In all cases, the coders were blind to the hypotheses of the study and to the experimental condition. Each variable was coded by a different pair of coders and each pair made their ratings independently. The coders analyzed each discussion in order to measure the two group process variables proposed to link attributions for past performance with the subsequent willingness to consider alternatives: Task effort and conformity pressure.

Task effort: Two coders who were blind to the hypotheses and study conditions were asked to count the number of statements made by each group member that were unrelated to the task of deciding whether to merge or not to merge with PC corporation. For instance, if a participant made a statement related to their weekend, or to an upcoming midterm, then their statement would count as being unrelated to the task. The ratings of the two coders were in perfect agreement, so their scores were averaged together.

As an additional measure of task effort, two additional coders were asked to count the exact number of contributions each person made to the group discussion during the 20 minute decision making period. A contribution was defined as any substantive comment related to the completion of the task. The total number of contributions was divided by three to obtain the average number of contributions made by each member of the group. A higher number of average contributions indicate greater effort expended by the group on the task. The ratings of the two coders were in perfect agreement, so their scores were averaged together.

Conformity pressure: Drawing from research on groupthink (Janis, 1982) conformity pressure in the group was first measured by asking two additional coders to rate the extent to which a group rushed toward premature agreement on a particular course of action or whether they paused to consider disagreements. Groups with a high level of conformity pressure tend to rush toward a premature agreement without thoughtfully considering conflicting points of view (Nemeth & Staw, 1989). Conformity pressure was coded on a scale of 1 to 5. Five indicated that the group rushed to agreement and one indicated that the group was slowed by disagreements. The inter-rater correlation between the two coders was high ($r = .80, p < .01$) so their scores were averaged together ($\underline{M} = 3.11, s.d. = 1.22$; $\underline{M} = 3.38, s.d. = 1.23$).

A more objective measure of conformity pressure was also used by counting the exact number of times one group member expressed doubt or skepticism about another group member's opinion on the merger. People should feel less comfortable to question the opinions of fellow group members when they feel pressure to conform to the group (Nemeth & Staw, 1989). Approximately one quarter of the videotapes (14 out of 55) were double-coded to test for inter-rater reliability. A high inter-rater correlation emerged between the two coders' assessments of the discussion ($r = .85, p < .01$) ($\underline{M} = 1.58, s.d. = .79$; $\underline{M} = 1.50, s.d. = .90$). With inter-rater reliability established, all analyses were based on the ratings of a single coder who analyzed all 55 videotapes.

Manipulation checks: In order to check the effectiveness of the attribution manipulation, two coders who were blind to the hypothesis of the study independently rated each group's attributions for their performance feedback. The coders made their ratings on a scale of 1 to 5 with 1 "the attributions listed focus on the group as a whole" and 5 "the attributions listed focus on the individuals in the group." An example of a group focused attribution is, "We succeeded

because we communicated well” and an example of an individually focused attribution is “We succeeded because John has an excellent memory.” The inter-rater correlation between the two coders was high ($r = .92, p < .01$), so their scores were averaged together ($\underline{M} = 2.98, s.d. = 1.73$; $\underline{M} = 3.13, s.d. = 1.63$).

To test the effectiveness of the performance feedback manipulation, we administered a questionnaire after the experiment was completed asking each participant whether the experimenter stated that (1) their group performed better than most other groups on the forecasting problem, (2) their group performed worse than most other groups on the forecasting problem or (3) the experimenter did not give any feedback about their performance on the forecasting problem. We checked to see whether each participant’s response matched the condition to which they were assigned.

In addition, we also tested the efficacy of the feedback manipulation in a less obtrusive way. Past research clearly suggests that groups who experience success attribute causality to factors internal to the group while groups who experience failure attribute causality to factors external to the group (Zaccarro, et al., 1987). Therefore, evidence for the effectiveness of the feedback manipulation would be given if the group who received feedback in this experiment also conformed to the typical group serving pattern.

A separate pair of coders who were blind to the hypotheses of the study independently rated each group’s attributions on a scale of 1 to 5 with 1 being an attribution to external factors and 5 being an attribution to internal factors. The inter-rater correlation between the two coders was high ($r = .70, p < .01$), so their scores were averaged together ($\underline{M} = 4.45, s.d. = .78$; $\underline{M} = 4.20, s.d. = 1.00$).

Session control variable: The data were collected during two separate periods, first during the spring semester and second during the summer session. Because the summer session is open to everyone while students during the regular semester are admitted only after passing through a rigorous admissions process, the students in the summer session tend to not be as highly qualified. These and other potential differences were controlled for by including a session control variable in all reported analyses.

Results

Manipulation checks

Confirming the attribution manipulation, groups who were asked to attribute their performance to specific individuals actually focused more on individual group members ($M = 4.50$, $s.d. = .88$) than groups who were asked to attribute their performance to the group as a whole ($M = 1.61$, $s.d. = .63$), $F(1, 51) = 207.53$, $p < .01$. There was no significant main effect for the type of feedback given, $F(1, 51) = 2.56$, ns . There was also no significant interaction between the attribution and feedback conditions, $F(1, 51) = 1.49$, ns .

Confirming the feedback manipulation, all participants correctly indicated the feedback (positive or negative) given by the experimenter. In addition, an analysis of the types of attributions given to explain the causes of the group's success or failure also supported the efficacy of the feedback manipulation. As would be predicted by past research (Salancik & Meindl, 1984; Staw, McKechnie & Puffer, 1983; Zaccaro, et al., 1987), groups who were given positive feedback regarding their performance were significantly more likely to attribute their success to factors internal to the group ($M = 4.75$, $s.d. = .40$) than were groups who were given negative feedback regarding their performance ($M = 3.89$, $s.d. = .92$), $F(1, 51) = 20.03$, $p < .01$.

There was no main effect for the type of attribution (individual versus group), $F(1, 51) = .30$, ns, nor was there an interaction between the attribution and feedback conditions, $F(1, 51) = .89$, ns.

Attributions and divergence of alternatives considered

In hypothesis 1, we predicted that groups who attribute their performance to specific individuals will consider a wider range of alternatives than will groups who attribute their performance to the group as a whole when the group succeeds but not when the group fails. To assess the extent to which groups considered alternatives prior to reaching a consensus, we first examined the sheer number of alternatives generated (fluency). A 2 x 2 ANCOVA showed a significant main effect for attribution condition such that groups who attributed their performance to specific individuals ($M = 5.86$; s.d. = 1.88) considered significantly more alternatives ($M = 4.86$; s.d. = 1.96) than groups who attributed their performance to the group as a whole, $F(1, 51) = 4.68$, $p < .05$, $\eta^2 = .08$. There was no significant main effect for feedback, $F(1, 51) = .13$, ns, $\eta^2 = .00$. However, there was a significant interaction between the type of feedback given and the type of attribution generated, $F(1, 51) = 5.35$, $p < .05$, $\eta^2 = .10$. See Figure 1.

 Insert Figure 1 about here

In support of hypothesis 1, groups whose attributions for success focused on each individual considered significantly more alternatives ($M = 6.5$, s.d. = 2.0) than groups whose attributions for success focused on the group as a whole ($M = 4.43$; s.d. = 2.28), $F(1, 25) = 7.76$, $p < .05$, $\eta^2 = .24$. Among groups who received negative feedback, there was no significant effect

of attributing failure either to properties of individuals ($\underline{M} = 5.29$, s.d. = 1.54) as opposed to properties of the group ($\underline{M} = 5.21$, s.d. = 1.42), $F(1, 25) = .02$, ns, $\eta^2 = .00$.

In addition to the sheer number of alternatives considered prior to making a decision, we also considered the extent to which these alternatives were divergent, or different from one another (flexibility). A 2 x 2 ANCOVA showed a marginal main effect of the type of attribution, $F(1, 51) = 2.89$, $p < .10$, such that attribution to properties of individuals caused groups to consider slightly more divergent alternatives ($\underline{M} = 4.41$, s.d. = 1.39) than attributions to properties of the group ($\underline{M} = 3.82$, s.d. = 1.36), $\eta^2 = .05$. There was no significant main effect for the type of feedback given, $F(1, 51) = .00$, ns, $\eta^2 = .00$. There was also a marginal interaction between type of attribution and type of feedback, $F(1, 51) = 2.89$, $p < .10$, $\eta^2 = .05$. Although the predicted interaction between type of attribution and type of performance feedback was only marginal, we conducted a planned contrast to test our hypothesis more directly. The planned contrast showed that groups who attribute their success to specific individuals generated significantly more divergent alternatives ($\underline{M} = 4.71$, s.d. 1.49) than groups who attributed their success to the group as a whole ($\underline{M} = 3.54$, s.d. = 1.55), $F(1, 25) = 4.93$, $p < .05$, $\eta^2 = .17$. Among groups who received negative feedback, there was no significant effect of attributing failure to specific individuals ($\underline{M} = 4.11$, s.d. = 1.27) as opposed to the group as a whole ($\underline{M} = 4.11$, s.d. = 1.13), $F(1, 25) = .00$, ns, $\eta^2 = .00$ (See Figure 2).²

Insert Figure 2 about here

Attributions and task effort

In hypothesis 2a, we predicted that groups who attribute their success to specific individuals will exert more effort on shared tasks than will groups who attribute their success to the group as a whole. The first measure of task effort was the number of statements each group made that were unrelated to the decision task. A 2 x 2 ANCOVA showed no significant main effect of the type of attribution, $F(1, 50) = 3.01$, ns, $\eta^2 = .06$. There was also no significant main effect of type of feedback given, $F(1, 50) = 1.66$, ns, $\eta^2 = .03$. Nor was there a significant interaction between type of attribution and type of feedback, $F(1, 50) = 1.84$, ns, $\eta^2 = .03$. Contrary to hypothesis 2a, groups who attributed their success to the group as a whole ($M = 2.07$, s.d. = 3.67) were not significantly more likely to discuss unrelated matters than groups who attribute their success to specific individuals, ($M = 1.36$, s.d. = 2.82), $F(1, 24) = .46$, ns, $\eta^2 = .02$.

The second measure of task effort was the average number of contributions to the group discussion made by each member of the group. A 2 x 2 ANCOVA showed no significant main effect of the type of attribution, $F(1, 50) = .01$, ns, $\eta^2 = .00$. There was also no significant main effect of type of feedback given, $F(1, 50) = .25$, ns, $\eta^2 = .01$, nor was there a significant interaction between type of attribution and type of feedback, $F(1, 50) = 1.42$, ns, $\eta^2 = .03$. Again contrary to hypothesis 2a, groups who attributed success to the group as a whole ($M = 11.17$, s.d. = 4.67) did not make fewer contributions to the group discussion compared to groups who attributed their success to specific individuals ($M = 12.52$, s.d. = 5.58), $F(1, 24) = .77$, ns, $\eta^2 = .03$.³ In hypothesis 2b we predicted that task effort would mediate the positive relationship between individually focused attributions for success and the exploration of alternatives. Since there was no effect of attributions on either measure of task effort, no further analyses were necessary. Hypothesis 2b was not confirmed.

Attributions and conformity pressure

In hypothesis 3a we predicted that groups who attribute their success to specific individuals will experience less conformity pressure than will groups who attribute their success to the group as a whole. The first measure of conformity pressure was the extent to which groups rushed toward agreement without considering disagreements (coded on a scale of 1 to 5 with 5 indicating that the group rushed to agreement and 1 indicating that the group was slowed by disagreements). A 2 x 2 ANCOVA showed no significant main effect of the type of attribution, $F(1, 50) = .52$, ns, $\eta^2 = .01$. There was a significant main effect of type of feedback given, $F(1, 50) = 11.75$, $p < .01$, $\eta^2 = .19$, such that groups who received negative performance feedback were more likely to rush toward agreement ($M = 3.71$, s.d. = .94) than groups who received positive performance feedback ($M = 2.77$, s.d. = 1.18). There was also a significant interaction between type of attribution and type of feedback, $F(1, 50) = 6.44$, $p < .05$, $\eta^2 = .03$. In support of hypothesis 3a, groups whose attributions for success were individually focused were significantly less likely to rush toward agreement ($M = 2.32$, s.d. = 1.10) than those who attributed their success to the group as whole ($M = 3.21$, s.d. = 1.12), $F(1, 24) = 4.21$, $p < .05$, $\eta^2 = .11$. There was no significant difference between groups who attributed failure to individuals ($M = 3.96$, s.d. = .82) and groups who attributed failure to the group as a whole ($M = 3.46$, s.d. = 1.01), $F(1, 24) = 2.08$, ns, $\eta^2 = .08$.

The second measure of conformity pressure was a count of the number of times one group member expressed doubt or skepticism about another group member's opinion of the proposed merger. A 2 x 2 ANCOVA showed no significant main effect of the type of attribution, $F(1, 50) = 1.78$, ns, $\eta^2 = .03$. There was also no significant main effect of type of feedback given, $F(1, 50) = .99$, ns, $\eta^2 = .02$. There was, however, a significant interaction between type of attribution and type of feedback, $F(1, 50) = 4.00$, $p < .05$, $\eta^2 = .07$. Again in

support of hypothesis 3a, groups who attributed their success to specific individuals ($\underline{M} = 1.79$, s.d. = .89), were more likely to express doubt as compared to those who attributed their success to the group as a whole ($\underline{M} = 1.08$, s.d. = .49), $F(1, 24) = 6.59$, $p < .05$, $\eta^2 = .22$. There was no significant difference between groups who attributed failure to individuals ($\underline{M} = 1.14$, s.d. = .66) and groups who attributed failure to the group as a whole ($\underline{M} = 1.29$, s.d. = .99), $F(1, 24) = .19$, ns, $\eta^2 = .01$.

In hypothesis 3b we predicted that conformity pressure would mediate the relationship between individually focused attributions for success and the propensity to consider divergent alternatives. We followed the procedures suggested by Baron and Kenny (1986) to formally test the mediation hypothesis. To establish mediation it has to be shown that (1) attributions affect the consideration of alternatives; (2) that attributions affect conformity pressure; (3) that the effect of attributions on the consideration of alternatives becomes non-significant when controlling for the effect of conformity pressure. Initial evidence for the mediation was given by the ANCOVA analysis showing that individually focused attributions (IV) for success caused groups to consider significantly more alternatives (DV) and more divergent alternatives (DV) than group focused attributions for success. Further evidence for mediation was also given by the analysis showing that individually focused attributions (IV) lowered conformity pressure as indicated by the extent to which they rushed toward agreement (mediator) and by the number of disagreements expressed during the group discussion (mediator). However, the extent to which groups rushed to agreement was not correlated with the number of alternatives considered ($r = -.16$, ns) nor with the divergence of alternatives considered ($r = -.05$, ns) prior to reaching consensus. Similarly, the number of disagreements expressed during the discussion was also not correlated with the number of alternatives considered ($r = .05$, ns) nor with the divergence of

alternatives considered prior to reaching consensus ($r = -.05$, ns). Because conformity pressure (mediator) did not influence the consideration of alternatives (DV), mediation was not demonstrated and hypothesis 3b was therefore not supported.

Discussion

We predicted that groups who attribute their success to specific individuals would explore more divergent alternatives than those who attribute their success to the group as a whole. The results were in line with our predictions. These findings are important in light of the fact that the consideration of alternatives is a critical determinant of a high quality decision making process (Janis, 1982).

In addition to providing evidence for the link between attributions and the consideration of alternatives, experiment 1 made two other important contributions to existing research. First, we theorized that the differential effects of individual versus group focused attribution would be more likely to emerge following success than failure because failure is attributed to external factors that are not only the same at both levels of analysis (Johns, 1999) but also more likely to be minimized or distorted (Taylor & Brown, 1988). Our results supported this prediction. When groups received negative feedback, different types of attributions had the same consequences for the propensity to consider alternatives and the quality of the groups' discussion. It was only when the groups received positive feedback that individually focused attributions facilitated the consideration of alternatives and reduced conformity pressure. These results led us to focus on attributions for positive feedback in experiment 2.

Second, we tested the potential group process mechanisms that might explain the link between attributions and the consideration of alternatives: conformity pressure and task effort. There was no evidence to suggest that the results could be explained by reduced task effort

following attributions to properties of the group. Although one might predict that attributing success to individuals might make the group feel that their efforts are identifiable, which should in turn increase task effort, the videotape analysis did not support this perspective. The lack of support for this prediction, however, may also be due to the fact that we did not measure feelings of accountability directly; a limitation we address in experiment 2.

An analysis of the videotape data did provide some support for the role of conformity pressure. Attributing success to group properties caused a tendency to rush toward agreement on a particular course of action. In addition, such groups were also less likely to express doubt or skepticism of each other's opinions. In other words, it was not the case that attributing success to individuals increased task effort and the sheer amount of discussion that took place, but rather recognizing individual contributions change the nature of the discussion by liberating people to question each other's opinions. We did not find evidence of a mediation effect but that may be due to the possibility that the willingness to consider disagreements and engage conflicting points of view may not be related to the sheer number of alternatives discussed; in fact norms for conflict could be an impediment on brainstorming tasks that are relatively independent and simply require people to share ideas with the group. However, as we consider in experiment 2, the reduction of conformity pressure via individually focused attributions may still be relevant on convergent tasks that require the group to share critical information and agree on one correct solution.

Despite these contributions, an important limitation of this study is that we did not measure the objective correctness of the final decision. However, as the merger between Hewlett-Packard and Compaq illustrates, in the real world there is often no obvious right or wrong answer, and often even a "good" decision making process can sometimes result in a poor

outcome and vice versa (Ratner & Herbst, 2005). Often the only recourse in such situations is to raise the quality of the group's decision making process as much as possible in order to maximize the likelihood of eventually reaching the correct decision (Kray & Galinsky, 2003). This study suggests that individually focused attributions, by stimulating the consideration of multiple alternatives, may be an additional tool in the effort to reach this goal.

Experiment 2

In experiment 1, we found support for our prediction that individually focused attributions for success would stimulate groups to share a wider range of alternatives prior to reaching a consensus than group focused attributions for success. Although the exploration of alternatives is a critical component of a high quality decision making process (Janis, 1982) we decided to extend our analysis in a second experiment by examining not only how different types of attributions for success influence the decision making process but also the accuracy of the final decision. As we noted in the previous section, our results from experiment 1 led us to focus specifically on attributions for success in this study.

Decision making groups are often formed because each individual member of the group possesses unique information that can be combined to reach a more accurate decision (Stasser & Titus, 1985). However, a long stream of research has shown that groups fail to exchange unique knowledge and focus instead on shared knowledge that all members have in common (Wittenbaum & Stasser, 1996). This tendency is particularly problematic when a hidden profile exists such that shared information points to a solution that is inferior to the solution that would be reached if everyone shared their unique information (Stasser & Titus, 1985).

A straightforward explanation for the common knowledge effect is that information held by more than one person is statistically more likely to be mentioned during a group discussion

(Stewart & Stasser, 1995). However, conformity pressure in groups may also exacerbate this tendency. Pressure toward unanimity in groups may cause people to withhold their unique information because sharing it may lead to conflict (Janis, 1982) particularly if the group is already leaning toward one particular point of view (Stasser & Stewart, 1992; Van Swol, Savadori & Sniezek, 2003). When common information is shared during a discussion, it reinforces and legitimizes what the other members of the group already know (Wittenbaum, Hubbell & Zuckerman, 1999). In contrast, a unique piece of information, held by only one person, cannot be verified by another member of the group and is therefore viewed as less reliable (Van Swol et al., 2003). In addition, unique knowledge may cast doubt on a group's already preferred course of action, thus making people reluctant to share information that contradicts the information held by other group members (Schulz-Hardt, et al., 2000; Van Swol, et al., 2003).

Existing research has uncovered a number of ways to encourage the sharing of unique information during group discussions (see Wittenbaum & Park, 2001; Wittenbaum & Stasser, 1996 for extensive reviews). For instance, the composition of the group can be varied by including group members who are familiar with each other and therefore more comfortable sharing unique information (Gruenfeld, Mannix, Williams & Neale, 1996) or by ensuring that the person who holds unique information is not also someone with whom the group is socially tied (Phillips, Mannix, Neale & Gruenfeld, 2004). Unique information is also more likely to be shared when the group is led to think critically by forming norms that permit criticism (Postmes, Spears & Cihangir, 2001) or by leading the group to think counterfactually (Galinsky & Kray, 2004).

Drawing on our theory and the results of our first experiment, we propose that attributions for past success may also impact the propensity to share unique information and lead groups to make more accurate decisions. We initially proposed two mechanisms that might link attributions to the quality of group decision making: conformity pressure and task effort. The results of the group process analysis from experiment 1 showed that individually focused attributions for success reduced conformity pressure as indicated by the fact that they were less likely to rush toward agreement and more likely to express criticism. These results suggest the possibility that individually focused attributions may raise the quality of group decision making because the increased willingness to express criticism may embolden individuals to share unique information that may initially conflict with the rest of the group's preferred course of action (Postmes et al., 2001). And by curbing the tendency to rush toward agreement, individually focused attributions may cause the rest of the group to fully consider unique knowledge that will prevent the group from reaching a quick consensus, and ultimately lead to the correct solution (Liljenquist, Galinsky & Kray, 2004).

We do not expect that individually focused attributions will lead groups to simply share more of all types of information (both shared and unshared) because the results of experiment 1 showed that individually focused attributions for success did not simply raise the sheer number of contributions made to the discussion by increasing task effort. Instead it changed the nature of the group discussion by liberating people to express alternative points of view. One could also make the related argument that attributions focused on the individual could increase feelings of accountability to the group, but based on past research (Stewart, Billings & Stasser, 1998) increased feeling of accountability would actually cause groups to share more common than unique information and therefore lower, not improve decision accuracy; a prediction that is

directly opposite to the one we propose. In contrast, we expect that individually focused attributions for success will cause groups to share more *unique* information which will in turn make them more likely to reach the correct solution. Therefore, we predict the following

Hypothesis 4: Groups that attribute their success to individuals will be more likely to reach the correct solution than will groups who attribute their success to the group as a whole when critical information is unshared.

Hypothesis 5: Groups that attribute their success to individuals will be more likely to share unique information during a group discussion than will groups who attribute their success to the group as a whole.

Hypothesis 6: The sharing of unique information will mediate the relationship between attributions and group decision accuracy.

Method

Participants

One hundred and thirty-two undergraduate students at a large university on the East Coast participated in the study in exchange for \$25. The sample consisted of 51% males, 49% females, 1% Asians, 59% European-Americans, 16% East Indians, 2% Hispanics, and 8% African-Americans. The remaining participants chose not to identify their ethnicity. Students were randomly assigned to groups and groups were randomly assigned to conditions. In this experiment, all groups were given false positive feedback about their performance and then they were asked to attribute their success either to specific individuals or to the group as a whole. There were 22 groups in the condition in which success was attributed to individuals and 22 groups in the condition in which success was attributed to the group.

Decision task

We adapted the murder mystery decision task from Stasser and Stewart (1992). Participants read a series of interviews from a fictional homicide investigation. These interviews

were presented in a packet that included other supporting materials, such as a map of the crime scene and surrounding areas, a personal note and a newspaper article.

The materials contained 28 clues in all, 11 of which were critical for solving the case. These clues were either incriminating or exonerating for the three male suspects (E, B, and M). There were two incriminating clues for Suspect B, two incriminating clues for Suspect E and two incriminating clues for suspect M. In addition, there were three exonerating clues for Suspect B, two exonerating clues for Suspect M, and no exonerating clues for Suspect E.

To create a hidden profile, these clues were distributed so that they were unshared. In each group, one member received two clues that exonerated suspect B, one that exonerated M and one that incriminated E. Another member received one clue that incriminated Suspect B, one clue that exonerated Suspect M, one clue that incriminated suspect M and a clue that incriminated Suspect E. The third member received one clue that exonerated Suspect B, one clue that incriminated B, one clue that incriminated suspect M and one clue that incriminated E. Collectively, group members had all of the necessary information to solve the crime but the solution to the mystery was not likely to be discovered unless the unique information was discussed. However, if all the evidence were considered, then it should be clear that Suspect E was the guilty party and had both the motive and the opportunity to commit the crime, and that he attempted to frame Suspect B.

Procedure

The study was divided into three phases described below.

Phase 1: Individual decisions

All students were seated and asked to remain quiet until the experiment began. There were three seats at the table, and each spot was labeled “A”, “B” or “C”. Once all the subjects

arrived, they were told that in this study we were interested in individual and group decision-making. We distributed the murder mystery materials to participants and gave them 20 minutes to read the information contained there and take notes, which they could use in the forthcoming group discussion. They were advised to read the materials carefully, because the experimenter would collect the materials after the 20-minute period. During this period, no interaction was allowed among group members. Each participant then individually completed a short questionnaire that asked them to check the name of the one suspect that he or she believed committed the murder and to provide a written rationale for that belief.

Phase 2: False positive feedback & attribution manipulation

We followed the procedures used by Goncalo (2004) to manipulate group attributions. After participants had completed the first phase, the experimenter returned to the room and collected the murder mystery materials. Next, participants were asked to complete a team building exercise in which they had to decide, as a group, on the items a family should take with them on vacation to the moon (North, 1991). All of the groups were told that there were correct answers to this problem, and that their group would be evaluated on how well they answered this question compared to other groups who had performed this task in previous studies. They were also told that the problem was more difficult than it first appeared and therefore, they should think carefully before arriving at their decision.

All of the groups were then given a picture of all the items the family could take and a copy of the instructions. The experimenter then assigned the subject sitting in position "A" the role of recording the group's solutions. Across all conditions, this person recorded their group's responses for the remainder of the experiment. All groups were given 10 minutes to work on the problem. After 10 minutes had elapsed, all groups were told that their time was up and to hand in

their answer sheet, which needed to be evaluated before the experiment could continue. The experimenter left the room and returned after 3 minutes. Upon returning to the room, the experiment gave all groups false positive feedback about their performance on the group task. All groups were told the following: “*Your group did well above average. This means that your group was able to identify more correct items than most groups have been able to do in my previous experiments.*”

After receiving their performance feedback, all groups were then told that in order for the experimenter to understand their group better, they must answer the following question as a group:

“What are the qualities of (*your group/the individuals in your group*) that you believe led to your (*above/below*) average performance on the previous task.”

All groups were given 5 minutes to discuss and respond to this question and the person seated in seat “A” was again asked to record the group’s answer.

Phase 3: Group decision

After completing this exercise, group members were given 20 minutes to discuss the murder case and make a group decision. Each group was asked to, as a group, decide on the suspect that they believed most likely committed the murder. All group discussions were video tape recorded, with the participants’ permission.

Dependent variables

Information sharing: To measure information sharing, we used the mentioning (at least once) of clues as an indication that they were shared with the group. Two coders who were blind to the hypotheses of the study were each given a checklist of all of the clues that might have been mentioned during the discussion. The coders did not know which clues were shared or unshared. The coders watched the video tapes alone and made their own independent judgments. The

inter-rater correlation was high for both the number of unshared clues that were mentioned ($r = .82, p < .01$) ($\underline{M} = 3.89, s.d. = 1.61$; $\underline{M} = 4.43, s.d. = 1.74$) and the number of shared clues that were mentioned ($r = .72, p < .01$) ($\underline{M} = 8.27, s.d. = 2.48$; $\underline{M} = 9.77, s.d. = 2.13$) so their tallies were averaged together.

Group decision accuracy: To measure group decision accuracy, we noted whether or not the group identified the correct suspect, E. The correct solution was coded as 1 and the incorrect solution was coded as 0.

Manipulation checks

In order to check the effectiveness of the attribution manipulation, two coders who were blind to the hypothesis of the study independently rated each group's attributions for their positive feedback. The coders made their ratings on a scale of 1 to 5 with 1 "the attributions listed focus on the group as a whole" and 5 "the attributions listed focus on the individuals in the group." The inter-rater correlation between the two coders was high ($r = .89, p < .01$), so their scores were averaged together ($\underline{M} = 2.68, s.d. = 1.49$; $\underline{M} = 3.41, s.d. = 1.34$).

Although we did not give groups false negative feedback in this study, we included several survey items to check on the believability of the false positive feedback manipulation. Participants were asked to rate the extent to which they agreed with the following statements, "My group performed better than most groups on the Trip to the Moon task", "I was satisfied with my group's performance on the Trip to the Moon task" and "My group chose more correct items that the family should take with them to the moon than most groups." Participants responded to these statements on a scale of 1 to 5 with "1 = strongly agree", "3 = I don't know" and "5 = strongly disagree."

Results

Manipulation checks

Confirming the attribution manipulation, groups who were asked to attribute their performance to specific individuals actually focused more on individual group members ($M = 4.27$, $s.d. = .65$) than groups who were asked to attribute their performance to the group as a whole ($M = 1.80$, $s.d. = .53$), $F(1, 42) = 192.96$, $p < .01$.

We analyzed the positive feedback manipulation check items using a one sample t-test with a test value of “3” corresponding to “I don’t know” on the scale. As expected, participants’ responses were significantly different from the baseline value “I don’t know” in response to the question of whether they performed better than most groups on the Trip to the Moon task ($M = 2.33$, $s.d. = 1.04$), $t(127) = 7.3$, $p < .01$, whether they were satisfied with their group’s performance ($M = 1.84$, $s.d. = 1.84$), $t(128) = 13.7$, $p < .01$, and whether their group chose more correct items than most groups ($M = 2.39$, $s.d. = 2.39$), $t(127) = 6.7$, $p < .01$.

Pre-discussion individual decisions

Consistent with past research we found, using a logistic regression analysis, that the number of individuals who selected the correct suspect prior to the group discussion was a significant predictor of whether the group would eventually choose the correct suspect after the discussion, $\beta = 1.55$, $Wald = 7.51$, $p < .01$. However, we also verified that there were no differences between conditions in the number of participants who selected the correct suspect prior to the group discussion, $\chi^2(df = 3, n = 44) < 2$, ns.

Group Decision Accuracy

In hypothesis 4, we predicted that groups that attribute their success to individuals will be more likely to reach the correct solution than will groups who attribute their success to the group as a whole when critical information is unshared. Consistent with our prediction, groups who

attributed their success to individuals were more likely to choose the correct murder suspect (73%) than groups who attributed their success to the group as a whole (36%), χ^2 (df = 1, n = 44) = 5.87, $p < .05$ (See Table 1).

 Insert Table 1 about here

Discussion of shared and unshared clues

In hypothesis 5, we predicted that unique information would be shared more in groups that attributed their success to individuals than in groups who attributed their success to the group as a whole. Consistent with our prediction, individually focused attributions for success caused groups to share significantly more unshared clues (\underline{M} =5.05, s.d. = 1.67) than group focused attributions (\underline{M} =3.86, s.d. = 1.61), $F(1, 42) = 5.73$, $p < .05$. The increased propensity to share information among individually focused group was, however, restricted to the sharing of unique not common information. There was a marginal difference in the total number of clues mentioned during the discussion with individually focused groups sharing slightly more clues (\underline{M} =15.05, s.d. = 2.21) than those who were group focused (\underline{M} =13.40, s.d. = 3.50), $F(1, 42) = 3.45$, $p < .10$. But when we focused only on the shared clues, there was no significant difference in how many clues were mentioned by individually focused groups (\underline{M} =10.00, s.d. = 1.75) as opposed to those who were group focused (\underline{M} = 9.55, s.d. = 2.48), $F(1, 42) = .49$, ns (See Table 1).

In hypothesis 6, we predicted that the sharing of unique information would mediate the relationship between attributions and decision accuracy. We followed the steps outlined earlier to formally test this hypothesis (Baron & Kenny, 1986). First, the extent to which groups made

individually focused attributions for success was positively associated with decision accuracy, $\beta = .57$, Wald = 5.2, $p < .05$. Second, sharing unique clues significantly increased the likelihood of choosing the correct suspect, $\beta = .63$, Wald = 6.53, $p < .05$. Finally, we conducted a logistic regression predicting decision accuracy in which attributions and the sharing of unique information were both entered into the model. We found that the positive effect of sharing unique information on decision accuracy remained significant, $\beta = .55$, Wald = 4.67, $p < .05$ but the effect of attributions become non-significant, $\beta = .42$, Wald = 2.5, ns, thus providing support for hypothesis 6 (See Figure 3). A Sobel test confirmed that the effect of type of attribution was significantly reduced after introducing the sharing of unique clues to the model ($z = 3.06$, $p < .01$).

 Insert Figure 3 about here

Additional Analyses

In experiment 1, we tested the possibility that individually focused attributions would stimulate group members to expend greater effort on the task by making them feel more accountable to the group. The prediction did not receive support from our group process analysis because individually focused attributions did not raise task effort. Nor did it receive support in experiment 2 because individually focused attributions led groups to discuss more unique information while accountability pressure tends to increase the sharing of common information (Stewart et al., 1998). Nevertheless, we included a measure of accountability in experiment 2 to test participants' perceptions more directly. We drew on the Felt Accountability Scale and adapted the items to our study (Hall, Royle, Brymer, Perrewe, Ferris & Hochwarter, 2006).

Participants were asked to indicate the extent to which each statement was characteristic of their group on a scale of 1 to 7 with 1 equal to very uncharacteristic and 7 equal to “very characteristic.” The scale consisted of four items as follows, “I often had to explain why I said certain things during the murder mystery case discussion”, “My group held me accountable for all of my decisions”, “To a great extent, the success of my group rested on my shoulders”, “My fellow group members closely scrutinized my efforts during the group task.” The scale was reliable ($\alpha = .72$). The results of a t-test showed no difference between the individually focused attribution condition ($M = 4.22$, s.d. = .95) and the group focused attribution condition ($M = 4.21$, s.d. = 1.19), $t(127) = .06$, ns (See Table 1). Although certain types of accountability may improve the quality of group decision making (Scholten, van Knippenberg, Nijstad & De Dreu, 2007), felt accountability does not seem to explain the results obtained in this study.

General discussion

We began by proposing a theoretical framework in which factors internal to the group are broken down into two distinct types of attributions: Attributions that differentiate between the contributions made by each individual member and attributions to the group as a whole. A central prediction derived from the proposed framework is that different types of attributions will have different consequences for the quality of group decision making. We found support for this prediction across two experiments. When attributions for group success focused on the contributions made by each individual, groups subsequently considered more alternatives prior to reaching consensus and the alternatives considered were also more divergent than those considered by groups who attributed their success to the group as a whole. In addition, individually focused attributions for success also increased the sharing of unique information and raised the likelihood of reaching the correct solution. These results clearly suggest that

attributions for past performance influence the quality of group decision making and that one way to reach more accurate decisions is to emphasize individual achievement.

We proposed and tested two potential mechanisms that might link attributions for past success to subsequent group performance. One possibility we considered is that individually focused attributions make people feel more identifiable and accountable to the group which should make them more motivated to expend effort on shared tasks. There was no evidence to support this explanation either in the video tape analysis of the groups working together or in the self report measures of felt accountability. A more likely explanation is that individually focused attributions break conformity pressure by encouraging people to stand out from the group to make their own unique contributions. This explanation is consistent with the findings from the video tape analysis showing that individually focused attributions made groups more willing to consider disagreement and more likely to express criticism. Similarly, the results of experiment 2 also showed that individually focused attributions emboldened people to share unique information suggesting that a focus on individual contributions may give people the courage to share knowledge that the rest of the group may initially want to ignore or suppress.

It is possible that group cohesion might explain our pattern of results if we assume that group focused attributions increase group cohesion to a point that stifles the free exchange of opinions (Janis, 1982). We included several survey items to test for this possibility in experiment 2 (Seashore, 1954), but we found no differences between conditions on the extent to which participants reported feeling that their group was cohesive, $t(39) = -1.09$, ns, that they liked other group members, $t(39) = -.57$, ns, or that they felt included in the group discussion, $t(39) = 1.42$, ns. Participants responded to these questions on a scale of 1 to 7 with 7 indicating a high level of cohesion. Participants in both conditions gave a mean response above 6 suggesting

that most people perceived a high level of cohesion in their group. These findings make sense in light of the possibility that a high level of cohesion can also be realized by emphasizing the unique qualities of each individual in the group. Since individuals tend to overestimate their contributions to group tasks (Forsyth & Kelley, 1994), recognizing their contributions might verify their self perceptions of importance, promote feelings of connection to the group and increase their willingness to voice creative solutions (Swann, Kwan, Polzer, Milton, 2003). In other words, it is not necessarily cohesion that lowers the quality of group decision making (Peterson, Owens, Tetlock, Fan & Martorana, 1998) but the mechanisms through which cohesion is achieved.

Contributions to attribution theory

The proposed framework extends past research by proposing a new dimension by which researchers can both describe causal attributions for group performance and predict when groups are more likely to make accurate decisions. Although the dichotomy between properties of the group and properties of individuals is widespread in groups research (e.g. McGrath, 1964), the two types of attributions are currently confounded in even the most fine-grained typology that exists to describe attributions for group performance (Zaccaro et al., 1987). Both types of attributions would be considered group-internal under the current classification scheme.

At a general level, the potential link between attributions and subsequent performance is an extension to current research on group attributions. Although a great deal of research has linked attributions to behavior at the individual level, there is currently no theory that would predict a similar link at the group level. In this respect, research on group attributions lags significantly behind similar research at the individual level of analysis (see Weiner, 1985). One reason for this dearth of attention to attributions at the group level is that attributions are often

presumed to be identical across levels (Johns, 1999). This push for a multi-level theory may be advantageous in terms of parsimony, but it is obscuring potentially important distinctions between attribution processes at the group and individual level of analysis. Both the conceptual distinction between different types of internal attributions and the consequences for convergent thinking that follow were derived from theories and research on groups. Therefore, the issues we have raised cannot be addressed by making direct comparisons between the group and individual level. Attributions for group performance are of interest in their own right, and require the development of theoretical models that are distinct from those developed to understand attributions made to explain individual outcomes.

Attributions moderate the consequences of group success

An additional implication emerging from this framework is that past success may actually give rise to divergent thinking depending on the attributions a group generates to explain it. This prediction is especially counterintuitive when considered in the context of research on organizational learning. According to Cyert and March (1963), the experience of success causes people to focus their attention on the refinement of existing solutions to a problem. This narrowed focus, called “local search,” is logical because exploring novel solutions may often be risky and time consuming (Levitt & March, 1988; Nelson & Winter, 1982). Furthermore, given that people are limited in their ability to process large amounts of information, it is less costly to focus attention on solutions that have produced success in the past (March & Simon, 1958). In other words, when people experience success they may continue to search for solutions to a problem, but this search will be increasingly more focused.

The concept of “local search” is analogous to the construct of divergent thinking examined in this paper (Audia & Goncalo, 2007). The proposed framework suggests, however,

that success may not always give rise to a narrower focus of attention. When group success is attributed to individual contributions, then the group may actually engage in the exploration of new ideas as opposed to the focused exploitation of previous solutions (March, 1991). By understanding the factors to which group success is attributed, more fine-grained predictions can be made about the effect of past success on subsequent group performance (Goncalo, 2006).

The proposed framework also has implications for research on collective efficacy. Collective efficacy is defined as group's shared belief that they can execute a task successfully (Bandura, 1997; Mischel & Northcraft, 1997). According to Bandura (1997) collective efficacy often emerges as a result of a mastery experience in which a group performs successfully on a specific task. This experience of success in turn gives group the confidence to set more difficult goals and the persistence required to achieve them. In other words, success gives rise to ever greater levels of success in an upward spiral of increasing achievement (Lindsley, Brass, & Thomas, 1995). There has been no research, however, on the attributions generated to these explain mastery experiences. The present framework suggests that although a group may be more confident following a successful experience, the confidence gained by this experience may actually cause failure on tasks that require divergent thinking. This prediction is in line with Whyte's (1998) argument that collective-efficacy may give rise to groupthink, but it specifies the underlying attributions that lead to either a narrow-minded persistence or a flexible consideration of alternatives. Our study suggests that groups can build a strong sense of collective efficacy while avoiding groupthink if they can shift their perceptions of causality to a focus on individual contributions.

Limitations and future research

An obvious limitation of this study is the use of an undergraduate student population and ad-hoc groups with no past history of interacting with one another. Therefore, we cannot be certain that the results will generalize to groups working in real organizations. However, we do know from field studies of close relationships (see Fletcher & Fincham, 1991) that the types of attributions discussed in this paper do in fact exist even if they have not yet been examined in studies on groups. And, the limitations in terms of generalizability are balanced by the advantages of separating two types of attributions that may be confounded in field settings and by showing that attributions can have a causal impact on group performance.

Future research might proceed in two directions. First, research might focus greater attention on the link between attributions and group performance. The findings linking individually focused attributions to group creativity (Goncalo, 2004) and the quality of group decision making suggest that attributions may influence a potentially broad range of group performance outcomes. The critical distinction between the effects of the two types of attributions seems to be that individually focused attributions stimulate greater divergent thinking and a more open exchange of ideas than group focused attributions. The existing research, including the present study, has focused on tasks that benefit from the open consideration of alternatives, but future research might examine tasks that require greater efficiency and coordination to identify the conditions under which attributions to the individual may come at a cost.

A second potential stream of research might examine the psychological mechanisms that drive a focus on either individual contributions or on the group as a whole. For instance, a bias toward properties of the group may be more frequent in collectivistic cultures than in individualistic cultures. Individualism-collectivism is a dimension by which cultures can be

distinguished in terms of how people view themselves in relation to each other. Collectivism emphasizes harmony and cooperation with one's group, while individualism emphasizes uniqueness and self-determination (Oyserman, Coon & Kemmelmeir, 2002). Collectivistic values by making the group salient over the individual (Chatman, Polzer, Barsade & Neale, 1998) may increase the propensity toward attributing success to the group as a whole (Goncalo & Kandathil, 2007). At a more general level, it is possible that any factor that strengthens individuals' identification with their group will also promote group focused attributions. For example, Dietz-Uhler & Murrell (1998) found that people who identify strongly with their group had higher self-esteem when given internal attribution for their group's success and external attributions for their group's failure. Thus, people who exhibit high identification with their group will be more likely to attribute success to the group as a means of enhancing or maintaining a positive self-image.

In addition, the diversity of the group may also moderate the tendency to attribute group performance either to individuals or to the group as a whole. Recent research has found that surface-level homogenous groups are likely to assume that they all possess similar information, whereas members of surface-level diverse groups are likely to expect informational differences (Phillips, 2003; Phillips, Northcraft & Neale, 2006; Phillips & Loyd, 2006). Extrapolating from this research, it is possible that because groups with surface-level diversity also expect and elicit task perspective differences, they may have more information about individual contributions that could in turn become a source of attributions about their past performance. The individually focused attributions triggered by surface level diversity could in turn lead to the performance outcomes that we observed in this study.

Another factor that may influence the type of attribution that people make for past group performance may be the level of turnover in the group over time. Given that attributions are also communicated in an effort to portray a sense of control over the environment (Salancik & Meindl, 1984) groups may prefer to attribute to properties of the group that persist even as individuals come and go and it might be strategically unwise to attribute success to a factor that is always changing. Therefore, the frequency of attributions to properties of individuals may increase in groups with a history of low turnover. Future research should also take into account the stability of success over time. For instance, if success is experienced consistently over time, but individuals are turning over at a high rate, then theories of co-variation would predict that individuals would not likely be viewed as causal (Kelley, 1971). However, if both group membership and success are relatively unstable and success is perceived to co-vary with changes in group membership, then individuals are more likely to be viewed as causal factors.

Conclusion

Numerous studies have identified a group serving bias in attributions in which groups attribute their success to internal factors. However, distinguishing between different types of internal attributions may point to important consequences of this bias for the quality of group decision making. Moreover, establishing a link between causal attributions and divergent thinking at the group level may be a first step toward a more general theory of attributions and group performance. At a more practical level, our results also suggest that managers should be critical of the increasing emphasis that is placed on teamwork and the attribution of success to team effort (Naquin & Tynan, 2003) because it may stifle creativity and lower the quality of group decision making. In contrast, we propose that an equally strong and opposing emphasis on individual achievement is required to counter these negative effects and allow groups to realize

their fullest potential.

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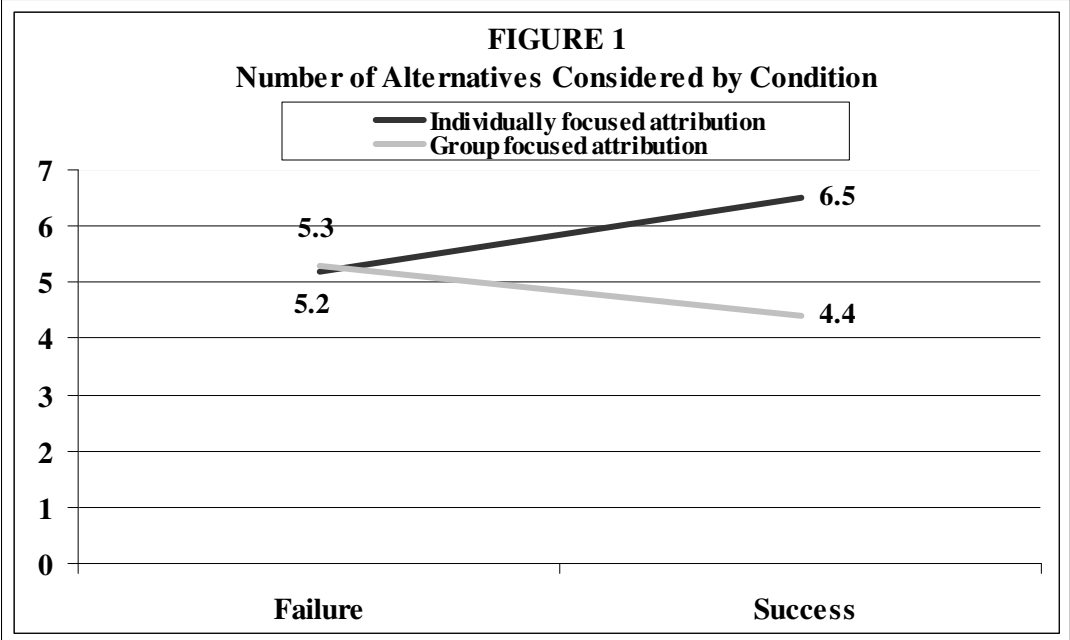
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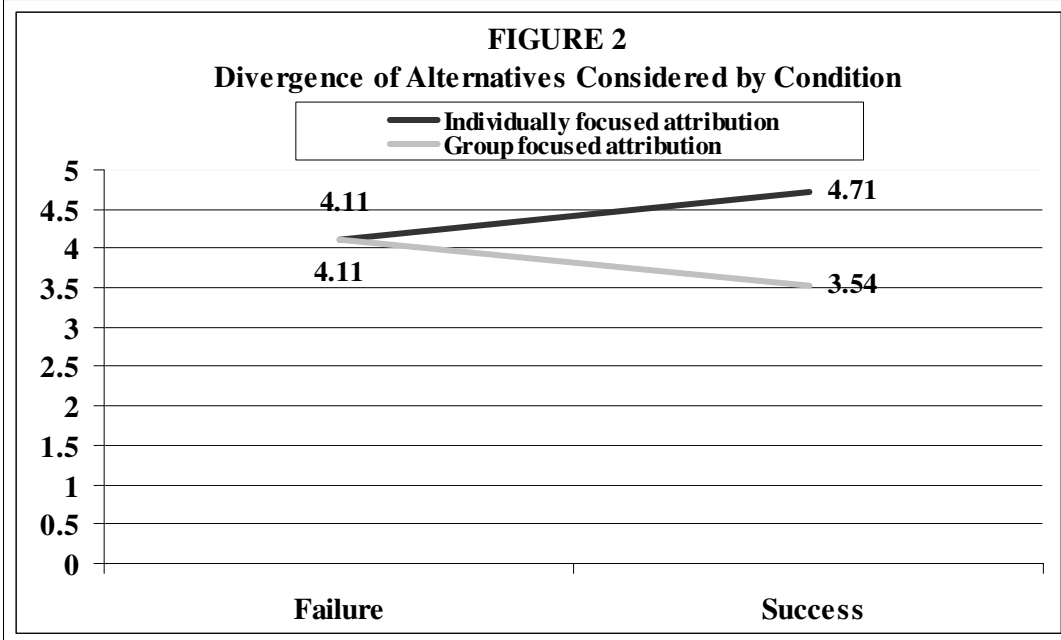
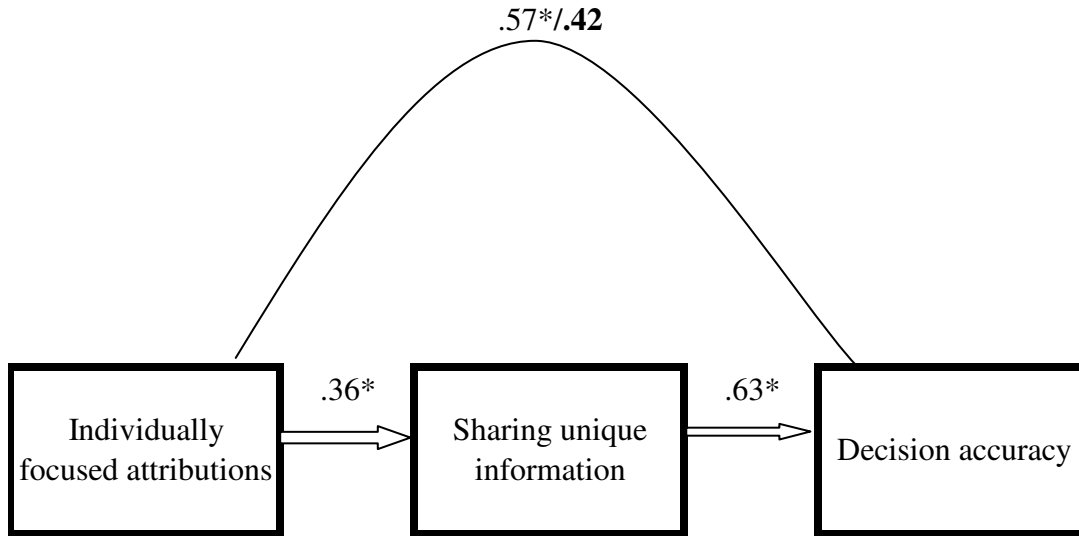


FIGURE 3
Main and Mediating Effects of Attributions, Unique Information and
Decision Accuracy^a



^a Beta in bold is based on a regression equation including the information sharing mediator. All analyses with decision accuracy as a DV are based on a binary logistic regression.

* $p < .05$

TABLE 1

Experiment 2: Means and standard deviations for group decision accuracy, number of unshared clues discussed, total number of clues discussed, number of shared clues discussed and accountability

	Attribution Condition			
	Individual Focus		Group Focus	
	Mean	S.D.	Mean	S.D.
Group Accuracy (Percent correct decisions)	73% ^a		36% ^b	
Unshared clues discussed	5.05 ^a	1.67	3.86 ^b	1.61
Total clues discussed	15.05 ^a	2.21	13.40 ^a	3.50
Shared clues discussed	10.0 ^a	1.75	9.55 ^a	2.48
Accountability	4.22 ^a	.95	4.21 ^a	1.19

Note : Within each row, means with different subscripts differ from each other at $p < .05$.

Endnotes

¹ Following Illgen (1999) we define a group as a collective of two or more individuals who (a) interact, (b) are interdependent and (c) share a common goal or objective. We use the words group and team interchangeably.

² Although the focus in this study was on the extent to which each group explored alternatives prior to making a decision, the final decision (merge vs. do not merge) is also of interest. The results showed that 55% of the groups decided against the merger, while the remaining 45% were in favor. We included the final decision to merge or not to merge as a covariate in all the analyses. All the results held, and since the covariate was not significant it was dropped from the analysis.

³ In addition to the average number of contributions made by each member of the group, the distribution of the contributions could also be an indication of task effort if the group was free riding on the efforts of the most active contributor. Therefore, the data on the number of contributions was further analyzed first by examining the difference between the most frequent contributor to the discussion from the least frequent contributor and second by calculating the variance in the number of contributions made by each member of the group. Neither analysis yielded any significant differences between the attribution conditions suggesting that free riding was not more pronounced in groups who attributed their success to the group as a whole.