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From Thinking About What Might Have Been to Sharing What We Know: The Role of Counterfactual Mind-Sets in Information Sharing in Groups

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Abstract

We hypothesized that the activation of a counterfactual mind-set minimizes group decision errors that result when a group relies on its members to share uniquely held information. In two experiments, groups were exposed to one of two pre-task scenarios in which the salience of counterfactual thoughts was manipulated. Subsequently they engaged in a murder mystery task. In both experiments, counterfactual mind-sets increased the discussion of uniquely held information and increased the likelihood of choosing the correct suspect. In addition, the number of counterfactual thoughts predicted both the discussion of unique information and decision accuracy. These results emerged regardless of whether the direction of the counterfactual thoughts was upward (Experiment 1) or downward (Experiment 2), suggesting that it is the process of thinking counterfactually and not the content of the counterfactuals that facilitated group decision making.

From Thinking About What Might Have Been to Sharing What We Know: The Role of Counterfactual Mind-Sets in Information Sharing in Groups

Complex decisions, from the military (i.e., when and where to launch an attack) to the economic (i.e., whether and how much to raise interest rates) to the legal (whether to indict or convict an individual) are constantly being made by groups. From these examples it is clear that such decisions have far reaching consequences affecting such important concerns as economic prosperity, incarceration, and even mortality. One reason that group decision making is complex is that group members are often dependent on each other for information. Making the decision that will maximize utility and promote success is especially difficult when individual members of a group each possess some unique information that is not commonly known. Under these circumstances, the group must pool all the information that it collectively possesses in order for the best decision to emerge. For example, many consequential medical decisions are made by pooling information from different expert physicians (Larson, Christensen, Abbott, & Franz; 1996; Larson, Christensen, Franz, & Abbott; 1998).

From the lack of preparedness at Pearl Harbor to the ill-conceived invasion of the Bay of Pigs, biased decision making can often have tragic consequences. The explosion of the space shuttle Challenger a mere 73 seconds after liftoff is one poignant example of group decision making gone awry. The Presidential Commission investigating the accident reported that inadequate sharing of information was an important contributor to the disaster. Although data was available that confirmed that low temperatures could cause the complete malfunction of the shuttle, this information was not widely disseminated (Report of the Presidential Commission on the Space Shuttle Challenger Accident, 1986). Key decision makers were never made aware of

this crucial information, solidifying their decision to proceed with the tragic launch, despite an air temperature that dipped below freezing the morning of the launch.

Groups must find ways to pool relevant information from each other in a coordinated and efficient fashion. Unfortunately for group decision accuracy, one well established finding is that group discussions are characterized by the tendency to focus discussions on commonly shared information to the relative detriment of uniquely held information—groups tend to focus on what everyone knows rather than on what only some of the group members know (Larson, Foster-Fishman, & Keys, 1994; Stasser & Stewart, 1992; Stasser & Titus, 1985; Winquist & Larson, 1998). This tendency means that group decisions are often biased in the direction of information that is commonly shared among group members, leading to a potential failure of collective intelligence. In this paper we suggest that thinking about what might have been (i.e., counterfactual thoughts) can counteract the biased information sampling tendencies of groups, thereby increasing the sharing and discussion of unique information and ultimately increasing decision accuracy.

The present experiments extend research and theory in a number of important ways. We demonstrate that cognitive orientations that reduce group biases do not have to be activated in the group decision making context, but can be made accessible in an earlier, separate context. We also demonstrate that the effect of counterfactual (mutable) primes on later problem solving behavior is associated with the construction of counterfactual thoughts; that is, the amount of counterfactual activation predicted both decision making processes (i.e., the discussion of unique information) and decision accuracy. Previous research (Galinsky & Moskowitz, 2000; Galinsky, et al., 2000) demonstrated that counterfactual primes affect behavior, but did not investigate underlying processes. Additionally, we show that the effect of counterfactual mind-

sets on information sharing does not depend on the direction of the counterfactual thoughts (upward vs. downward).

Another goal of the present set of experiments is to extend previous findings on counterfactual mind-sets to the group domain. Previous demonstrations of counterfactual primes have only shown that they affect individual, as opposed to group, decision making. In addition, groups, rather than individuals, constructed counterfactual thoughts in the present experiments. Ultimately, we examine how counterfactual mind-sets impact the manner in which groups process information by examining the ability of groups to uncover a hidden profile and avoid biased information sharing.

Increasing Information Sharing

How can all the information that is available to a group be discovered and shared? What are the conditions that promote the discussion of unique information? Although intuitively it would seem that modifying the structure and context of group discussion would decrease biased information sharing, many of these modifications have no debiasing effect or they, somewhat ironically, exacerbate biased information sharing. Separating the discussion of information from the judgment stage fails to reduce the bias (Stasser, Taylor, & Hanna, 1989) and increasing the group size is generally ineffective (Stasser, et al., 1989). Even making the task more important only slows the rate of information dissemination in groups (Larson, et al., 1994). Finally, increasing accountability by requiring the group to justify their decision or action to someone else actually exacerbates the narrow focus on shared information (Stewart, Billings, & Stasser, 1998).

Cognitive mind-sets that encourage balanced information searches and information sharing might improve group decisions. In fact, how groups construe the task in front of them

can influence the information sharing process. Stasser and Stewart (1992) determined that framing a task as a problem with a clear solution to be identified improves the balance of information sharing in a group relative to framing the task as a judgmental one. In their experiment, the framing of the task provoked a mind-set that altered the sharing of unique information and the solicitation of discrepant information, which suggests that how the task is construed affects the decision making process. Are there other mind-sets that can be activated that will slacken the compulsive focus on shared information and decrease decision errors? If so, can these mind-sets be activated independent of the group decision making context?

Counterfactual Mind-Sets

Thoughts about "what might have been" have a powerful influence on how individuals approach what is not yet. In other words, being presented with a situation in which a salient counterfactual exists—or a sense of what almost or might have happened—influences future behavior (Galinsky, Seiden, Kim, & Medvec, in press; Roese, 1994). For example, Roese (1994) found that directing participants to construct counterfactual thoughts after one anagram task led to better performance on a subsequent anagram task; counterfactual thinking increased performance by helping to specify the necessary conditions to avoid replication of previous errors.

Having people think about what might have been in one context can even impact subsequent decision making and problem solving in a completely unrelated context. Counterfactual mind-sets make simulations and awareness of relevant alternatives more accessible and this process of mental simulation can then carry over to a later unrelated task. Galinsky and Moskowitz (2000) argue that exposure to a salient counterfactual heightens an individual's awareness that there is more than one possibility to be considered when making

decisions, which increases the likelihood of engaging in mental simulations of alternate states of reality (Kahneman & Tversky, 1982). To test this hypothesis, they examined whether activating a counterfactual mind-set decreases the tendency of individuals to fall prey to the confirmation bias in hypothesis-testing situations (Snyder & Swann, 1978; Trope & Liberman, 1996). In Galinsky and Moskowitz's experiments, exposure to a counterfactual in an earlier, unrelated context increased the selection of hypothesis disconfirming questions, presumably by increasing the accessibility of the alternative and converse hypothesis.

Experiment 1

Our first experiment involved a group decision making task in which all of the available information was dispersed in the group, rendering group members highly interdependent. Groups were not told that individual group members possessed unique information; in this way, the spontaneous searching for and sharing of information among group members under counterfactual and non-counterfactual mind-set conditions could be examined. Because all groups in the current experiment have identical information, we can capture how counterfactual mind-sets affect the focus of group discussions and their influence on decision accuracy.

The tendency for groups to focus on shared information to the relative exclusion of unique information is particularly destructive when the correct decision alternative is a hidden profile. A hidden profile is a superior decision alternative that is not obvious due to the manner in which information is distributed; commonly shared information will lead to the selection of one (incorrect) decision alternative, whereas the pooling of all the unshared, unique information will lead to the selection of a different (and correct) alternative (Stasser, 1999; Stasser & Stewart, 1992). Due to inadequate scanning and sharing of information among group members, groups are often unaware that unique information exists (Stasser & Titus, 1985). Whereas groups tend

to focus on commonly shared information, it is the sharing of uniquely held information that is often predictive of decision making quality (Winquist & Larson, 1998). If counterfactual mind-sets serve to raise awareness about alternate realities, then they should increase the discussion of unique information and ultimately improve group decision accuracy in hidden profile problems.

Method

Overview and design. The experiment involved two conditions: a counterfactual prime condition and a non-counterfactual prime condition. The group decision task involved selecting a suspect that the group believed committed a homicide.

Participants. Participants were 90 MBA students enrolled in an introductory organizational behavior course. The group decision task took place as part of a classroom exercise during the third week of a 15-week class. Each group was comprised of three individuals who worked together for the first time. Two groups were excluded from the analysis for not following the instructions.

Decision task. We used the decision making task described in Stasser and Stewart (1992). Participants read a series of interviews from a homicide investigation; these interviews were presented in a booklet that included other supporting materials such as a map, a handwritten note, and a newspaper article. These interviews contained clues that were either incriminating or exonerating for each of the three suspects (E, B, and M). A fourth suspect (G) was included in the decision task because previous research has found that participants often choose her as a default, mainly because they want to believe that the wife was the murderer (K. Williams Phillips, personal communication); however, she is the only one who implicates herself. Although the amount of incriminating information on each of the three suspects was equal, there were two pieces of exonerating information for suspect M and three pieces of exonerating

information for suspect B. Once all the evidence is considered, suspects B and M should be exonerated and participants should conclude that suspect E had both motive and opportunity to commit the crime and had attempted to frame suspect B. Three incriminating clues about Suspect E and the five clues that exonerated Suspects M and B were critical for identifying E as the guilty party. To create a hidden profile, these clues were unshared. In each group, one member received the two clues that exonerated suspect M, one member received two clues that exonerated suspect B and two clues that implicated suspect E, and one member received one clue that exonerated suspect B and one clue that implicated suspect E. Collectively, the three group members had all of the information.

Procedure. At the beginning of the class session, each participant was handed a packet. Instructions and a group identification number were presented on the first page. This number corresponded to a room in which group members would meet with their other group members to conduct a discussion and make a decision. Before meeting their group members, participants were given 20 minutes to read their booklet, and take notes that they could bring to their group discussion. They were advised to read their materials carefully, as they would not be able to take the booklet into their group discussions. After 20 minutes, participants were asked to individually select "the one suspect you believe murdered Robert Guion" and to provide a brief justification for their choice. After going to their group decision making rooms, each three-member group was handed a group decision booklet.

Before beginning the murder mystery task, groups were instructed to spend five minutes engaging in a "team building exercise," which provided the basis for the counterfactual prime manipulation. Participants in the counterfactual prime condition read a scenario in which the protagonist Sue was at a rock concert of her favorite band. Because her seat was not very close

to the stage, Sue switched to a vacant seat in the third row. Shortly thereafter, the emcee walked out on stage and announced that a valuable prize would be awarded to one lucky winner. The woman then reached her hand into a receptacle filled with ticket stubs and announced the winner was the person who currently occupied Sue's old seat. This scenario has been shown to activate upward counterfactual thoughts (Galinsky & Moskowitz, 2000) in which people express thoughts similar to "if only she had not moved she would have won". In the non-counterfactual prime condition, a similar scenario was presented, except that Sue did not switch seats and the lucky winner was someone in a different seat altogether. Groups read the team building scenario together and were then asked to "list some thoughts running through Sue's mind" as a group. To encourage only spontaneous thoughts, we did not number the sheet to list Sue's thoughts. Unlike previous demonstrations of the effects of counterfactual primes, all information relevant to the group decision was processed before the counterfactual primes.

After completing the team building exercise, groups were instructed to spend a maximum of 20 minutes discussing the murder mystery case and making a group decision. They were told to, "assume you are assistants to Lieutenant Moody. Please discuss the evidence and, as a group, choose the one suspect you believe committed the murder." After 20 minutes of discussion all groups were required to make their group decision. When participants returned to the classroom they completed a post-discussion questionnaire that asked them to identify each informational item that was discussed in their group's discussion. It was stressed, both verbally and in the questionnaire's written instructions, that they should identify only those items that had been actually discussed and not ones that they might have merely read. Each of the unique clues (6) was included, as well as 6 of the shared clues. The shared clues that were included were chosen

because each contained implicating information on the three main suspects and were crucial clues in determining which suspect was chosen.

Results and Discussion

Counterfactual activation. Two independent coders identified the number of thoughts listed by groups as to what might be going through Sue's mind that were counterfactual in nature. The reliability for counterfactual thoughts was high ($\alpha = .92$) and therefore the ratings of the two coders were averaged. As expected, groups in the counterfactual prime condition ($M = 1.47$) listed significantly more counterfactual thoughts than groups in the non-counterfactual prime condition ($M = .62$), $F(1, 26) = 9.9$, $p < .01$ (See Table 1). One alternative explanation for this effect and for the effect of counterfactual primes on decision making processes and accuracy is that counterfactual primes induced groups to write more thoughts, with counterfactual thoughts being just one incidental byproduct of this overall increase in writing output. To rule out this alternative explanation we counted the number of word written and it did not differ by experimental condition, $F < 1$.

Pre-discussion individual choices. After reading the mystery and before group discussion, participants indicated who they believed committed the murder. The number of people who selected each of the four suspects per experimental condition was submitted to a chi square analysis. There were no pre-discussion differences in the two experimental conditions, χ^2 ($df = 3$, $n = 81$) < 1, ns.

Group decision. Groups primed with a counterfactual mind-set were more likely to select the correct suspect ($M = 66\%$) than were groups that discussed a scenario that did not contain any counterfactual possibilities ($M = 23\%$), χ^2 ($df = 1$, $n = 28$) $= 5.2$, $p < .05$.

Group decision process. We identified those clues which were selected by all three group members in their post-task assessment as clues that had been discussed. The number of shared and unique clues were submitted to a 2 (condition: counterfactual prime vs. no counterfactual prime) X 2 (type of clue: shared vs. unique) mixed model ANOVA with repeated measures on the second factor. Only a significant Counterfactual Condition X Type of Clue interaction emerged significant, $F(1, 26) = 7.3$, $p < 01$. Consistent with our hypothesis, groups in the counterfactual activation condition ($M = 4.1$) increased the discussion of unique clues compared to groups that were not exposed to a counterfactual scenario ($M = 3.2$), $F(1, 26) = 5.2$, $p < .05$. For shared clues, the reverse pattern was true, with the no counterfactual prime condition discussing more shared clues ($M = 3.5$) than the no counterfactual condition ($M = 3.1$), although this difference was not significant, $F(1, 26) = 1.1$, $p = .31$. Counterfactual activation did not increase the discussion of all clues, but unique clues in particular.

We next conducted correlational analyses to determine the relationship between counterfactual activation, discussion of unique clues, and group decision accuracy (Winquist & Larson, 1998). The amount of counterfactual activation, as operationalized by the number of counterfactual thoughts listed in the pre-decision task, was correlated with both the number of unique clues discussed, $r(28) = .43$, $p < .05$, and post-discussion decision accuracy, $r(28) = .58$, $p < .01$. In addition, the number of unique clues discussed was correlated with post-discussion decision accuracy, $r(28) = .37$, $p = .05$. The number of shared clues discussed did not correlate with any of the variables.

To gain a better understanding of the underlying processes, we conducted a several analyses of covariance (ANCOVA), which allowed us to examine the effect of experimental condition when controlling for the influence of one of the process variables. First, when

controlling for the amount of counterfactual activation, experimental condition no longer had a significant effect on post-discussion decision accuracy, $F(1, 25) < 1$, $p = .34$. Second, when controlling for the number of unique clues discussed, experimental condition no longer had a significant effect on post-discussion decision accuracy, $F(1, 25) = 3.1$, $p = .09$. Finally, when controlling for the amount of counterfactual activation, experimental condition no longer had a significant effect on the number of unique clues discussed, $F(1, 25) = 1.3$, $p = .26$. Counterfactual activation increased the discussion of unique clues, ones oft ignored in the course of group discussion, which ultimately led to greater decision accuracy.

This experiment demonstrates that the beneficial effect of counterfactual mind-sets on problem solving extends to the group domain. Counterfactual primes increased the tendency of groups to discuss unique and unshared information, thereby increasing decision accuracy. Importantly for understanding how counterfactuals affect group discussions, they did not simultaneously increase the tendency to dwell on shared information. Because the correct suspect was a hidden profile, group members needed to disclose their unique information in order to arrive at the correct solution. Counterfactual primes allowed the hidden to become exposed, leading groups from the incorrect to the correct suspect.

Experiment 2

The first experiment demonstrated clear evidence that counterfactual mind-sets can decrease biased information sharing. There are a number of issues that we sought to address in a second experiment. We have suggested that thinking counterfactually in one context activates a counterfactual mind-set that increases mental simulation and awareness of alternatives. Our model of counterfactual mind-sets suggests that the content of the counterfactuals should not matter. In the literature, counterfactuals are classified according to the direction of comparison.

Upward counterfactual thoughts occur when an individual compares the current reality to a better possible world. On the other hand, downward counterfactual thoughts occur when an individual compares his or her own outcome to a worse possible alternative. The first experiment explored the effect of upward counterfactual thoughts, in which better possible worlds are considered, on group decision making.

Would counterfactual thinking have influenced group decision making if the counterfactual thoughts were downward rather than upward? There is reason to suspect that downward counterfactual thoughts may not produce the same facilitative effects on decision accuracy. Roese (1994) suggested that upward counterfactual thoughts serve a preparative function but that downward counterfactual thoughts serve an affective function. He found that generating upward counterfactual thoughts after one anagram task facilitated performance on a second anagram task. Downward counterfactual thoughts, on the other hand, served to increase affect, but they did not positively influence subsequent performance. Thus, downward counterfactual thoughts can be used to make oneself feel better but upward counterfactual thoughts can be used to improve performance.

However, it is important to note a number of reasons why downward counterfactual thinking may not have had a positive influence on performance in the Roese (1994) experiments. In the Roese experiments the counterfactual thoughts were directly related to the subsequent performance. Because the tasks were the same and the counterfactual thoughts were directly relevant to the second task, the content of the counterfactual thoughts may have mattered. Thus, in the Roese experiments, counterfactuals were not serving as primes. When the counterfactual thoughts are unrelated to the subsequent task and are thus serving as primes, we hypothesize that

content won't matter. Therefore, downward counterfactual thoughts should also have a facilitative effect on group decision making.

Another benefit of altering the type of counterfactual prime used in this experiment is that it will allow us to determine if the decision making effect observed in Experiment 1 depends on the emotional or motivational states associated with upward counterfactuals. Upward counterfactuals tend to reduce people's satisfaction and produce feelings of regret (Kahneman & Miller, 1986; Markman, Gavanski, Sherman, & McMullen, 1993; Medvec et al., 1995; Medvec & Savitsky, 1997). On the other hand, downward counterfactuals tend to produce emotions ranging from increased joy and a sense of relief to guilt and surprise because one avoided an alternative negative outcome (Medvec & Savitsky, 1997; Roese, 1994). If the emotional reactions evoked by upward counterfactuals are responsible for improving group decision making in Experiment 1, then we would not expect to replicate the effect in the current context using downward counterfactuals, which activate a clearly distinct set of emotions.

Method

Design. The experiment involved two conditions: a counterfactual prime condition and a non-counterfactual prime condition. The group decision task involved selecting a suspect that the group believed committed a homicide.

Participants. Participants were 63 MBA students enrolled in a course of groups and teams. The group decision task took place as part of a classroom exercise during the third week of a 5-week class. Each group was made up of three individuals.

Counterfactual manipulation. We altered the scenarios used in Experiment 1. First, in both scenarios the protagonist wins, rather than loses, the trip to Hawaii. Second, the new counterfactual scenario, which was based on a scenario from Galinsky and Moskowitz (2000),

was altered so as to produce downward rather than upward counterfactual thoughts. In this scenario, after Sue switched seats, the emcee announced that Sue's new seat was the winner. In the non-counterfactual prime condition, a similar scenario was presented, except that Sue did not switch seats and her current seat was the winner. Groups read the team building scenario together and were then asked to "list some thoughts running through Sue's mind" as a group.

Decision task. We used the decision making task that was used in Experiment 1. After completing the team building exercise, groups were instructed to spend a maximum of 20 minutes discussing the murder mystery case and make their group decision (to choose the one suspect they believed committed the murder). When participants returned to the classroom they completed a post-discussion questionnaire that asked them to identify each informational item that their group discussed. Each of the unique clues (6) were included, as well as all of the shared clues. Each of the shared clues contained implicating information on the three main suspects. In this experiment we used all the implicating shared clues rather than just 6 clues in order to get a more precise measure of group discussion.

Results and Discussion

Counterfactual activation. As in Experiment 1, two independent coders identified the number of thoughts listed by groups as to what might be going through Sue's mind that were counterfactual in nature[12]. The reliability for counterfactual thoughts was high ($\alpha = .90$) and therefore the ratings of the two coders were averaged. As expected, groups in the counterfactual prime condition ($M = 1.0$) listed significantly more counterfactual thoughts than groups in the non-counterfactual prime condition ($M = 00$), $F(1, 19) = 151.35$, $p < .001$ (See Table 2). We again tested for whether counterfactual primes increased counterfactual thoughts simply by virtue of also increasing the overall amount of words written. There was a significant effect of

experimental condition, F(1, 19) = 4.3, p = .05, but it was in the opposite direction as the alternative explanation would have predicted. Those groups who were not primed with a counterfactual (M = 44.8) wrote longer responses than did groups primed with a counterfactual (M = 30.3).

Pre-discussion individual choices. After reading the mystery and before group discussion, participants indicated who they believed committed the murder. The number of people who selected each of the four suspects per experimental condition was submitted to a chi square analysis. There were no pre-discussion differences in the two experimental conditions, χ^2 (df = 3, n = 63) = 1.4, ns.

Group decision. Groups primed with a counterfactual mind-set were more likely to select the correct suspect (M = 70%) than were groups that discussed a scenario that did not contain any counterfactual possibilities (M = 27%), χ^2 (df = 1, n = 21) = 5.2, p = .05.

Group decision process. We identified those clues that were selected by all three group members in their post-task assessment as clues that had been discussed. The number of shared and unique clues were submitted to a 2 (condition: counterfactual prime vs. no counterfactual prime) X 2 (type of clue: shared vs. unique) mixed model ANOVA with repeated measures on the second factor. Only a significant Counterfactual Condition X Type of Clue interaction emerged significant, F (1, 19) = 6.0, p = 02. Consistent with our hypothesis, groups in the counterfactual activation condition (M = 3.8) increased the discussion of unique clues compared to groups that were not exposed to a counterfactual scenario (M = 2.6), F(1, 19) = 5.2, p < .05. For shared clues, the reverse pattern was true, with the no counterfactual prime condition discussing more shared clues (M = 5.4) than the no counterfactual condition (M = 4.6), although this difference was not significant, F (1, 19) = 1.1, p = .30.

We next conducted correlational analyses to determine the relationship between counterfactual activation, discussion of unique clues, and group decision accuracy. The amount of counterfactual activation, as operationalized by the number of counterfactual thoughts listed in the pre-decision task, was correlated with both the number of unique clues discussed, $r(21) = .44$ $p < .05$, and post-discussion decision accuracy, $r(21) = .43$, $p = .05$. In addition, the number of unique clues discussed was correlated with post-discussion decision accuracy, $r(21) = .39$, $p < .05$, one tailed. The number of shared clues discussed did not correlate with any of the variables.

As in Experiment 1, we next conducted several ANCOVA's to better understand the underlying processes. When controlling for the amount of counterfactual activation, experimental condition no longer had a significant effect on post-discussion decision accuracy, $F(1, 18) < 1$, $p = .75$. In addition, when controlling for the number of unique clues discussed, experimental condition no longer had a significant effect on post-discussion decision accuracy, $F(1, 18) = 1.8$, $p = .19$. Finally, when controlling for the amount of counterfactual activation, experimental condition no longer had a significant effect on the number of unique clues discussed, $F(1, 18) < 1$, $p = .53$.

Counterfactual primes again had a facilitative effect on the discussion of unique clues and ultimately on decision accuracy. As in Experiment 1, the amount of counterfactual activation (i.e., the number of counterfactual thoughts expressed) predicted both the number of unique clues discussed and decision accuracy. Counterfactual primes positively influenced performance even though the type of counterfactual thoughts were downward rather than upward, supporting our notion that activating a counterfactual mind-set activates a tendency towards mental simulation and consideration of alternatives that is independent of the content of the original counterfactual thoughts and the emotions associated with the counterfactuals.

General Discussion

Across two experiments, activating a counterfactual mind-set had a facilitative effect on group decision making. Expressing counterfactual thoughts in one context decreased biased information sampling in a later context by increasing the discussion of unique clues. Counterfactual primes led to insight, the spontaneous discovery and use of available but unshared information. We have suggested, consistent with the theorizing of Galinsky and Moskowitz (2000) and Galinsky et al. (2000), that activating a counterfactual mind-set increases the tendency towards mental simulation and awareness of alternatives. Counterfactual primes allowed the concealed to become detected, and the hidden profile to become visible. The debiasing effect of counterfactual primes occurred regardless of the direction of the counterfactual thoughts (upward vs. downward). The consistent findings suggest that it was the process of thinking counterfactually and not the content of the counterfactual thoughts or their concomitant emotional reactions that aided group decision making.

The facilitative effect of counterfactual mind-sets on group decisions involving information dependencies is primarily due to the increased accessibility of thoughts about alternate states of reality. By reminding group members in a prior context that more than one possible reality exists, the sharing of uniquely held information increased. The amount of counterfactual activation was positively related to the amount of unique information that was shared during group discussion and ultimately to decision accuracy. In all previous studies of counterfactual primes (Galinsky et al., 2000; Galinsky & Moskowitz, 2000), the effect of the amount of counterfactual activation on later judgments and decisions was not investigated. In the present experiments the amount of counterfactual activation predicted the type of information

sharing and decision choices, thus implicating the process of thinking counterfactually as the source of debiasing.

This paper extends our understanding of group decision making in a number of important ways. Previous research had established that structurally altering the group decision context often does not have a positive impact on decision accuracy. Separating the discussion of information from the judgment stage, (Stasser, et al., 1989), increasing the group size (Stasser, et al., 1989), increasing accountability (Stewart, et al., 1998), and even increasing the importance of the task (Larson et al., 1994) either have no effect or actually exacerbate group decision biases. In the two present experiments, counterfactual mind-sets improved group decision making by providing a cognitive mechanism that led to mental simulation and a greater consideration of alternatives. Unlike previous research that structured the group's cognitive orientation within the group task (Stasser & Stewart, 1992), the current experiments manipulated cognitive orientations with one task and examined their effect on a subsequent task, demonstrating that exposure to a counterfactual scenario in one context can carry over into an unrelated context. Counterfactuals appear to be a powerful mechanism for guiding group discussions and, ultimately, group decisions.

The Effect of Mind-Sets

Why and how does counterfactual activation affect subsequent, unrelated judgments? Both Gollwitzer et al. (1990) and Chen et al. (1996) demonstrated that the activation of a particular cognitive orientation in a prior context can drive subsequent information processing and memorial strategies. The experiments presented here demonstrate that a cognitive orientation based on alternatives to reality can systematically affect the discussion of unique information. It should be noted that the activation of counterfactual alternatives is triggered by near misses and

norm violations. Why would attending to alternatives endure and extend to the sharing of information or the testing of hypotheses (see Galinsky & Moskowitz, 2000; Kray & Galinsky, 2001)? The experiments and theorizing by Gollwitzer et al. (1990) are particularly instructive on this point—deliberating about one's goals in one task leads to deliberative tendencies in other unrelated contexts because deliberation is a functional, well-learned strategy for approaching the world. Roese (1994) points out that counterfactual thinking, like deliberative thinking, is a pervasive feature of mental life and its ubiquity stems from its functionality and assistance in performing goal-directed behavior—once activated the mind-set persists because it is a well-learned functional strategy for comprehending the world.

Although only specific types of scenarios activate counterfactual thoughts, the content and direction of those thoughts do not appear to moderate the effect of counterfactual primes. Given that upward and downward counterfactuals differ in their content (better vs. worse possible worlds) and emotional reactions, one way of demonstrating that counterfactual mind-sets affect how we think and not just what we think is to show that upward and downward counterfactual thoughts have the same facilitative effect on group decisions. Across the two experiments, we found similar effects of upward counterfactual activation (Experiment 1) and downward counterfactual activation (Experiment 2) on group decision making. The research on deliberative mind-sets is similar in that the priming effects do not depend on the content of what participants deliberate about in the first task.

Limitations and Future Directions

The present research provides clear and compelling evidence that counterfactual mind-sets can improve group decisions involving information dependencies. There are number of avenues, however, for future research. One question is whether the manner in which

counterfactual thinking is activated determines its effect on subsequent performance. First, do all members of a group need to be in a counterfactual mind-set in order for its facilitative effect to come to fruition, as opposed to a minority of group members? There is reason to believe that a vocal minority of group members who have experienced a counterfactual recently is sufficient to guide the group in a productive direction (Nemeth, 1986; Petersen & Nemeth, 1996; Stewart & Stasser, 1998), but this remains an empirical question. Second, does it make a difference whether the counterfactual thoughts are self-relevant or not? In the present experiments, the counterfactual thoughts were about another individual, a mere protagonist in a scenario. Self-relevant counterfactuals may do just as well at activating a counterfactual mind-set marked by mental simulations and consideration of alternatives. However, self-relevant counterfactuals may lead to ruminations in which the ability to focus on the present task is impaired (Sherman & McConnell, 1995). Self-relevant counterfactuals may also lead to divergent effects of upward and downward counterfactuals, given that rumination and recriminations are more likely to follow from self-relevant upward counterfactual thinking but not self-relevant downward counterfactual thinking (Sherman & McConnell, 1995).

Despite its overarching functional nature, a counterfactual mind-set does not always produce beneficial results. Galinsky and Moskowitz (2000) suggested that counterfactual mind-sets can both bias and debias thought and action, depending on the nature of the task (see also Galinsky, Seiden, Kim, & Medvec, in press). Counterfactual primes can lead to the discovery of hidden solutions, as in the present experiments, but also hidden errors. The role of counterfactual primes in debiasing thought can be seen as similar to the effects of accountability, which often leads to flexible, multidimensional thinking, but can also result in a rigid defense of positions and actions (Tetlock, Skitka, & Boettger, 1989), to reliance on non-diagnostic information

(Tetlock & Boettger, 1989) or on shared information (Stewart, et al., 1998). Although in the present experiments counterfactual primes increased the decision accuracy of groups, it is important to explore the group decision making contexts in which counterfactual mind-sets will lead to decreased decision accuracy.

Conclusion

A persistent challenge in many group contexts is to effectively harness the vast array of information that individual group members bring to the decision making table. From life or death decisions pertaining to medical treatments and military actions to personnel selections, individuals with unique information often convene to reach a collective decision. Unfortunately, these individuals are not always aware that they possess unique information and ultimately they often fail to share their unique information with other group members. A wide body of evidence suggests that group discussions are often biased towards commonly shared information, which will often result in sub-optimal decisions. The findings presented in this paper paint an optimistic picture that suggests activating a cognitive mind-set that makes salient thoughts about alternate realities serves as a functional reminder for groups to seek out and incorporate unique information. Thinking about what might have been can enable group members to share all they know and ultimately improve decision accuracy.

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Footnote

[1] We included expressions of guilt as examples of counterfactual thoughts. We did so for three reasons. First, Kahneman and Miller (1986) describe how many emotions from surprise to regret emerge and result from the construction of counterfactual thoughts; that is, some emotions require alternatives to reality to explain their very activation. In this scenario, expressions of guilt suggest that participants are aware that by switching seats and winning they are depriving the individual who was originally in the seat the opportunity to win. Thus, guilt implies the alternative state in which the other person and not Sue wins the trip. Second, expressions of guilt are also consistent with work by Miller and Turnbull (1990), which suggests that counterfactual thoughts often implicitly express not only what almost happened but what should or ought to have happened. Third, although it might appear to be the case that guilt as a negative emotion would seem to contradict the notion of the affective contrast and positive emotional responses to downward counterfactual thoughts, McMullen (1997) has demonstrated that downward counterfactuals typically produce affective assimilation rather than affective contrast. For example, someone who just misses a bus and that bus gets into an accident will often not only feel relief, but also guilt, anxiety, and fear at the awareness how close they came to being hurt.

Table 1

Experiment 1: Means and Standard Deviations of Decision Accuracy, Number of Counterfactual Thoughts, Number of Unique Clues Discussed, and Number of Common Clues Discussed Across Experimental Conditions

	Experimental Condition	
	Counterfactual	Non-Counterfactual
Percent Correct	67% [a]	23% [b]
Number of Counterfactual Thoughts	1.47 [a] (.79)	0.62 [b] (.64)
Number of Unique Clues Discussed	4.1 [a] (1.2)	3.2 [b] (1.1)
Number of Common Clues Discussed	3.1 [a] (1.1)	3.5 [a] (1.3)

Note: Standard deviations are in parentheses. Means with different superscripts for each measure differ from each other at $p \leq .05$.

Table 2

Experiment 2: Means and Standard Deviations of Decision Accuracy, Number of Counterfactual Thoughts, Number of Unique Clues Discussed, and Number of Common Clues Discussed Across Experimental Conditions

	Experimental Condition	
	Counterfactual	Non-Counterfactual
Percent Correct	70% [a]	27% [b]
Number of Counterfactual Thoughts	1.0 [a] (.28)	0.0 [b] (0.0)
Number of Unique Clues Discussed	3.8 [a] (.92)	2.6 [b] (1.4)
Number of Common Clues Discussed	4.6 [a] (1.4)	5.4 [a] (1.8)

Note: Standard deviations are in parentheses. Means with different superscripts for each measure differ from each other at $p \leq .05$.