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What is it about unique ideas? The effects of utility and social norming on the exchange of unique information

Parker, Susan Libby, Ph.D.

Rice University, 1992
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WHAT IS IT ABOUT UNIQUE IDEAS?: THE EFFECTS OF UTILITY AND SOCIAL NORMING ON THE EXCHANGE OF UNIQUE INFORMATION

by

SUSAN LIBBY PARKER

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE DOCTOR OF PHILOSOPHY

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SUSAN LIBBY PARKER

Abstract

Little is known about how groups use their most precious commodity: information held by group members. In particular, until the recent work of Stasser and his colleagues, almost nothing was known about how groups differentially use commonly held information and information that is known only by one member. Stasser's probabilistic information sampling model explains differential treatment of uniquely and commonly held information by explaining that more group members have access to commonly held than uniquely held information, so the commonly held information is more likely to be mentioned in discussion (Stasser & Titus, 1985, 1987). This model has been primarily supported for first mentions of information at the group level (Stasser, Taylor, & Hanna, 1989). In the study reported here predictions from a suggested model were tested on second and further mentions of information to determine if anything other than probability contributes to withholding of unique information by group members. It was expected that group member concerns about utility of information (including task relevance and validity) and social norms regarding sharing unique information might contribute separately and in combination to the withholding of unique information after it was discovered unique (via the first mention). Manipulations of confirmation of information utility and social norming were expected to increase repeat mentions of uniquely held information relative to commonly held information. University students read information about study
abroad programs and decided as a group whether to recommend such a program for their university. Conversations of two- and three- person groups were audio-tape recorded and analyzed at both the group and individual level for mentions of commonly and uniquely held information. Perceptions of information usefulness, recognition of item uniqueness, and perceptions of group process were gathered after the group discussion. As expected, the manipulations did not affect first mentions. For second and further mentions social norming and utility confirmation singly and in combination tended to lower the advantage of commonly held information, although not always significantly. Suggestions for further research are made and recommendations for applications for decision making groups are based upon the demonstrated positive effectiveness of the utility confirmation manipulation.
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To Scott, who helped me in myriads of ways: so many that I know there is such a thing as a pwka, really;

To my boys and family who issued strength and hope from far away; to Dick, who always knew I could do this; and to me, who always knew I would,

Thank you
To Mary Basset, Jean Towle and Bill Wade, who taught me a lot about struggle,

"The spirit of a warrior is not geared to indulging and complaining, nor is it geared to winning or losing. The spirit of a warrior is geared only to struggle, and every struggle is a warrior's last battle on earth. ...And as he wages his battle, knowing that his will is impeccable, a warrior laughs and laughs."

(Castaneda, 1969)

Thank you. Thank you.
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Introduction

Two or three individuals meet to discuss an issue. You see it everywhere; you participate in such behavior all of the time. Whether the issue is where three friends should eat lunch or how many on-site nuclear inspections two superpowers should allow each other, the procedure is basically the same: information is exchanged and a decision is reached. This dissertation is the story of a research effort about small group performance in a discussion. Specifically, it addresses the question of whether group members in dyads and triads talk more about information they all know or new information available from only one person.

In general, researchers have long considered information to be a resource for group task performance (e.g. Steiner, 1966). Further, it is commonly agreed that the group's resources play a part in determining the performance of the group (Bottger and Yetton, 1985; Hackman and Morris, 1975; Hall & Williams, 1966; Shfflet, 1979). Indeed, Lanzetta and Roby (1960) monitored group communications during an experimental task and concluded that "the way the group 'utilizes' its resources and the procedures it employs for communicating essential information are as important, if not more important than 'knowledge' of the problem for determining its performance" (p.146). More recently, Vinokur and colleagues (1985) reiterated this theme in a field study of panels evaluating medical technologies for the National Institutes of Health. They found that "just as in many experimental studies, it was shown here that the nature of the interaction among the participants, particularly the extent to which novel information was exchanged, is the most important determinant of the quality of the decision outcome (Hall, 1971; Steiner, 1972; Vinokur &
Burnstein, 1978)" (Vinokur, Burnstein, Sechrest, & Wortman, 1985, p. 83). Given that group members bring different informational resources to their groups, the object of this research was to study differential communication of uniquely and commonly held information in task groups.

**Resource or Transformer?**

Research on performance in small groups has produced numerous models which Shiflett (1979) generalized to a single, three variable model including resources (R), transformers (T), and outputs (P)(Davis, 1973; Hackman and Morris, 1975; McGrath and Altman, 1966; Naylor and Dickinson, 1969). The simplest form of this general model can be stated, P=f(T,R). Shiflett (1979) defined resources as "the raw materials that are essential for the creation of the product and without which the product could not exist", transformers as "all the variables that have an impact on resources and determine the manner in which they are incorporated into and related to the output variables", and output variables as "any products that can be considered as an outcome of group interaction..." (p. 67). He (1979) strongly recommended studying the effects of both uniquely and commonly held resources on group performance, referring to previous models of group performance which had emphasized either the pooling of unique resources (Kelley & Thibaut, 1969; Laughlin & Branch, 1972; Laughlin, Branch, & Johnson, 1969; Laughlin & Johnson, 1966) or the effect of redundant resources (Zajonc & Smoke, 1959; Shiflett, 1972, 1973, 1976). Consequently, both shared and uniquely held resources were addressed in this study.
Efficient Resource Use in Small Groups

Perhaps one of the major reasons that resource use in small groups has been so extensively studied (see Davis & Stasson, 1988 for a review) has been to reconcile the conflicting literature on the individual versus group productivity question. Common sense and more than fifty years of empirical findings tell us that whatever enables group performance to surpass that of individuals is strongly and positively related to the effective use of the resources that group members bring to their task (e.g. Hall & Williams, 1966; Laughlin, Kerr, Davis, Halff, & Marciniak, 1975; Lorge & Solomon, 1955; Watson, 1928; Yetton & Bottger, 1982). In a classic text on group process and productivity, Steiner (1972) reasoned that the maximum potential of a group is determined by task demands and member resources. He suggested that group productivity would equal potential productivity as long as there were no losses due to faulty group process. Such a suggestion requires that member task-relevant information be fully discerned and shared, and it follows logically that anything less than total disclosure of member resources constitutes "faulty group process". In a 1982 review of the group versus individual performance literature, Hill reiterated the equation of loss of resources with "faulty group process" via the conclusion that group productivity is primarily determined by the competence of the member with most task-related resources and is affected positively by increases due to efficient group interaction and negatively by faulty group process.

During the task group's orientation stage, member efforts are directed toward discovery of the purpose for the group, exploring the relevant problem, and determining what resources the group members bring to the task (Bales & Strodtbeck, 1951). Of these three tasks, efficient resource identification may be the most critical to the group product. Bass (1960, p. 450) stated that "logically,
ignoring motivation, the only possible causal effects on team productivity are the resources and capabilities of the individual members as modified by how they interact with each other." Hackman and Morris (1975, p. 67) suggested that group interaction serves the purpose of "assessing and weighting the possible contributions of different group members who presumably vary in the level of task relevant talent they have brought to the group." Hackman, Brousseau, and Weiss (1976, p.352) suggested that explicit discussions of strategy could serve to alter norms in small task-oriented groups, and that "when the task is structured so that groups are likely to adopt a task appropriate strategy, performance should vary solely as a function of the degree to which members utilize their resources effectively in the performance of the task."

One framework in which efficient resource utilization has been studied is that of the "best member model" wherein groups' performances are expected to equal the performance of their best member (Comrey & Staats, 1955; Ekman, 1955; Lorge & Solomon, 1955; Marquart, 1955; Palmer, 1962; Taylor, 1954; Wiest, Porter & Ghiselli, 1961). This model gathers support from research by Hall and Watson (1970) and Tuckman and Lorge (1962) which suggested that trained groups were superior to control groups because the best member's solutions to problems were brought to light during interactive group decision making.

In addition, there is growing evidence that groups can at least outperform their average members (Shaw, 1981), especially when they make careful and rational use of member expertise (Laughlin, Kerr, Davis, Halff, & Marciniak, 1975; Yetton & Bottger, 1982). For disjunctive tasks, where the basis for the group's potential is determined by the most competent group member, or additive tasks, where the potential is the sum of group contributions, effective
group performance depends upon discovering and utilizing the resources of the best member and/or all resources that the members bring to the task (Parker, 1986; Steiner, 1972). In fact, using resource identification strategies, groups have been shown to outperform even their best members (Parker, 1986).

**Communication of Resources and the Information Sampling Model**

Communication of member resources is an important function in group task performance, and sharing of information among group members is necessary for effective group decision making. Levine and Moreland (1990) reviewed the recent research on group discussion outcomes and suggested that group discussion may be biased by group members' failure to mention uniquely held information. Mentioning such information has been demonstrated to contribute to better decisions in groups (Vinokur, Burnstein, Sechrest, and Wortman, 1985). However, recent research on Stasser's model of information sharing (Stasser & Titus, 1985) has uncovered a robust difference between group member sharing of uniquely and commonly held information (Stasser & Titus, 1985, 1987).

*Information sampling model.* In 1985, Stasser and Titus proposed a model of discussion based on the probability of sampling information from the available pool of resources. They suggested that the probability of mentioning any given item of information, p(D), is related to the number of members who could mention the information, n, and the likelihood that any one member would mention the item, p(M). The model expressed this as,

\[ p(D) = 1 - [1 - p(M)]^n. \]  

(1)

In this model, n equals one for uniquely held information and two or three (depending on whether the group is a dyad or triad) for commonly held information. As an example to clarify this equation, if p(M) for an item of shared
information were equal to .4 in a dyad, then p(D) would equal .64. But if p(M) were equal to .4 for an item of uniquely held information in a group of any size, then p(D) would equal .4. By virtue of this equation, as Stasser and Titus (1985, 1987) noted, this model predicts that commonly held information is more likely to be discussed than is uniquely held information. It is interesting to note that this model is purely probabilistic in nature and does not take into account social or group interaction factors. Just as there is a higher chance of uncovering a head when two people flip coins than when only one person does so, mentioning a single idea is more likely the higher the number of people holding the idea. In 1985 and 1987, Stasser and Titus tested this model indirectly by comparing pre- and post-discussion recall of unique and shared information among group members. Comparisons "yielded scant evidence that members learned about previously unshared information from fellow group members. In fact, Stasser and Titus (1987) found that substantial gains in recall of previously unshared information occurred only when there was little information to be discussed (low information load) and when most of the information was unshared before discussion" (Stasser, Taylor, & Hanna, 1989, pp. 68-69).

Communication of Information

These information sampling studies have been based upon the premise that resource sharing is a critical function in group performance. For example, Stasser and colleagues' research is focused on the pooling of unshared information in group decision making (Stasser & Titus, 1985, 1987; Stasser, Taylor, & Hanna, 1989). Their concurrence about the criticality of resource sharing is evident in the suggestion that "the opportunity for [small group] members to inform their cohorts of uniquely held information permits, in theory,
collective decisions to be better informed than individual decisions" (Stasser, Taylor, & Hanna, 1989, p. 67). Unfortunately, Stasser and colleagues have found that uniquely held information is less likely to be mentioned in problem solving group discussions than shared information (Stasser & Titus, 1985, 1987; Stasser, Taylor, & Hanna, 1989). This suggests that if information is held by only one member it may not be contributed to the group effort, even if it is correct and necessary for the task solution. Where resources are critical to the solution of a group problem, and as groups are required to perform with increasing efficiency, this finding becomes an increasingly important problem for group effectiveness and productivity. Indeed, this has been shown to occur outside the laboratory in cockpit crews of jet airliners. Foushee (1984) reported that although "multipiloted aircraft cockpits were designed to ensure needed redundancy.... [this redundancy] has failed because crewmembers who possessed adequate information have for some reason not provided it to others" (p. 885).

Stasser and colleagues have begun to look at variables which may help to explain the predominance of shared over uniquely held information in discussion. Recently, they looked at the effects of using a strategy to encourage group members to focus on information exchange (Stasser, Taylor, & Hanna, 1989). The strategy they imposed required group members to spend more time sharing information rather than reaching a decision quickly. This strategy did not accomplish the desired effect of increasing the percentage of mentions of uniquely held information in discussion. Indeed, results showed that uniquely held information was not mentioned as often as shared information. They found "it was almost as likely for a shared item to be mentioned twice as it was for an unshared item to be mentioned at all" (Stasser, Taylor, & Hanna, 1989,
Clearly, the focus on information exchange did not produce the desired sharing of uniquely held information among group members, nor did it explain the phenomenon. From a retrospective viewpoint, it seems apparent that a strategy for increasing information exchange would increase the likelihood of mentioning *any* bit of information, not just the uniquely held information relative to that commonly held.

**Limitations in Previous Research**

Stasser and his colleagues' research on information sharing seems to end just at the interesting part. Their studies (e.g. Stasser, Taylor, & Hanna, 1989) demonstrate that group members more frequently mention commonly held information than uniquely held information, but their results focus on the first mention of the information, at which time the group members may be virtually randomly sampling from their information pool. Although there may be worth in discovering that uniquely held information is less likely than commonly held information to be mentioned purely on a random sampling basis, surely there is more to a group discussion than a sampling of information. For one thing, group members may be motivated to mention one type of information (e.g. uniquely held) more than other types. Even more importantly, efficient and effective groups ought to recognize the potential importance of unique information and pay particular attention to it during group discussion. For example, one could imagine that group members, although they might not know at the outset which information was uniquely held, would try to identify it and discuss it fully as a valuable resource.

In their 1989 study, Stasser and colleagues' first to record and code conversations, they paid scant attention to the repeated mentions, the very mentions which might have shed light on the mechanism by which group
members chose to mention unique information rather than shared information. First mentions of information are likely to be a result of static probability, whereas the choice to make repeated mentions is affected by perceptions gained from the group discussion. This is the point where the phenomenon could tell us something about group communication, because it is only after the first mention of an item that the group knows whether the information is commonly held or not.

**Rationale for Current Research**

The study reported here was conceived to answer the question, "Why is uniquely held information treated differently than commonly held information by group members?" Consequently, manipulations were planned to differentially affect group member treatment of their unique and shared information. In response to Shiflett's (1979) suggestion that transformation and resource variables should be considered simultaneously in group research, independent measures were chosen for this study to manipulate both group process and group members' perception of their resources: the social norm of the group regarding introduction of unique information (a process manipulation) and the utility of the information (a resources manipulation). First, an intervention to impose a social norm making socially acceptable, even desirable, the sharing of uniquely held information was expected to change how the group members proceeded to communicate their unique information, and thus change the process the groups used. Second, an intervention confirming the utility of the provided information was expected to affect group members' perceptions of their task-relevant resources. This was expected to increase attention to the resource component of their discussions. Both manipulations were expected to increase the mention of uniquely held ideas relative to the control situation, and
an interaction of the two manipulations was expected. The manipulations were not expected to affect shared information, nor were they expected to affect the mentioning of information the first time, that being strictly a probabilistic process.

**Suggested process.** Consistently in Stasser's studies, the commonly held information showed a far greater likelihood of being mentioned in group discussion than did the uniquely held information. This difference could be explained simply by the fact that more people know the same information, and thus the likelihood of its being mentioned increases (Shiflett, 1979). However, the more interesting finding was that commonly held information had a much greater chance of being repeated and considered than uniquely held information, even after both were mentioned once (Stasser & Titus, 1985, 1987; Stasser, Taylor, & Hanna, 1989).

A logical explanation for how this phenomenon occurs is that group members sample from their information resources as they present items to the group, and the group's reaction either discourages or encourages continued conversation on each item. See Figure 1. For example, if the other group members also share this same information, they might corroborate it and continue the conversation regarding it. On the other hand, if the item were new to the other group members (as is the case with uniquely held information), its introduction to the group might be met with a negative reaction or no reaction at all, and conversation would be changed to a different topic. Such a non-supportive response would likely discourage the holder from mentioning this unique information again, and it would be effectively withheld from the group task solution. Given that groups are frequently created of individuals with specific and unique information, any loss of that resource presents an obstacle to task solution.
Non-supportive response from the group may explain how the loss of uniquely held information occurs, but why unique information, once mentioned, is not repeated in groups seems a more interesting question. This question has not been answered in the group effectiveness literature. In 1989, Stasser and his colleagues concluded that overall, substantial amounts (about 30%) of information were repeated at least once during discussion. The fact that information was frequently repeated is not surprising and is consistent with Fisher's (1980) spiral model of discussion. He contended that group discussion often touches on one issue, continues on to other issues, and then returns to reconsider the previously discussed issue.

What is surprising to us is that our groups were more likely to cycle back to shared information than to unshared information. The fact that unshared information was new to most of the members seemed to divert rather than attract subsequent attention. (Stasser et al., 1989, p.77)
Task-related member knowledge has commonly been considered a critical group resource, and the frequent loss of this knowledge in group interaction has been written off simply as "process loss" (Steiner, 1972). It is surprising how little attention has been directed toward explaining such loss. Granted, the small group literature has many studies which focus on strategies to improve group performance (e.g. consensus decision making, brainstorming, or nominal group technique interventions; see Grossman, 1984; Nemiroff and King, 1975; Van de Ven and Delbecq, 1971, 1974), and vast numbers of studies about whether groups perform as well as their best or average member (see Davis, 1969 and Steiner, 1972 for reviews of the early research) but there is a dearth of research on maximizing the contribution of every group member toward the optimum group performance. No studies were found which have examined members' contributions to group discussions in light of their knowledge about the utility of their information.

Sometimes a person knows that s/he holds unique information and withholds it for reasons of secrecy or power. Individual motivations such as this being held constant, group members may also be reluctant to remention unique information if they are not certain of its utility. It is possible that cognitive concerns about comparison of one's ideas to those of other group members inhibit further member sharing of uniquely held resources, after they are discovered to be unique. Also, the other group members may not immediately grasp the utility of unique information and may subtly discourage its being mentioned again. What is suggested here is that a concern about information usefulness (including concerns about validity, relevance, and importance) may be one reason why uniquely held information is not repeated in groups. If so, confirmation of the information's utility for the task should ameliorate this effect.
See Figure 1. This comprised the utility manipulation; whether information was described as useful. Specifically, half of the groups were told that their reports had been constructed of information relevant for group discussion of the task, and that pretesting had confirmed the relevance, validity and utility of the information for such discussions. The expectation was that external confirmation of utility would encourage the repeat mentioning of unique information.

The uncertainty associated with unique information is a common phenomenology. However, factors other than concerns about utility may result in withholding of uniquely held information. Motivation to avoid disapproval of other group members may discourage sharing of uniquely held information in favor of that known to be held by others. For example, in many instances people consider it rude to bring up ideas that they alone hold. Perhaps group members in a business context might be willing to share their unique expertise, where those in a more informal setting might be wary of doing so lest they appear "know-it-all's". In such a case, a social norm regarding the group's discussion of only commonly-held, and thus "safe", topics may develop. This might be another reason why group members limit repeating information found to be unique. See Figure 1. To test this possibility the social norm of groups was manipulated to enhance contribution of unique ideas to their discussion, with the expectation that such a norm would encourage repeat mentioning of unique information. Specifically, half of the groups were told that unique information was particularly valuable for the group discussion, and that every group member should be eager to hear and share new information.

**Effects of group size on process.** The small group literature has long regarded group process and ultimate performance as a function of group size,
member ability, and group decision scheme (Bray, Kerr, & Atkin, 1978; Davis, 1969; Shaw, 1981; Steiner, 1966, 1972). For example, Laughlin, Kerr, Davis, and Halff (1975) considered the effects of group size, member ability and choice of decision schemes on group decisions, finding "a direct linear increase in performance with increasing group size from one to three, no difference from three to four, and then a further increase from group size four to five" (Laughlin, Kerr, Davis, Halff, & Marciniak, 1975, 527). They concluded that group size and member ability were important factors in studies of group process for solving problems and making decisions. For this effort in studying group process, group size was manipulated using dyads and triads, while member ability was left free to vary with the random assignment of subjects to groups. The choice of dyads and triads was partly in response to Laughlin et al's (1975) observation that performance stabilized between group membership of three and four individuals. The choice was also affected by the notion, frequently empirically supported, that member participation decreases as group size increases (e.g. Indik, 1965; Gibb, 1951; Hare, 1952; Shaw, 1981). From this, it seemed as though a critical amount of information about the research question could be learned from studying sizes less than four. Also, Steiner's (1986) chapter on paradigms and groups reminds us that studies of interacting groups of size greater than dyads are rare, and that "as Simmel (1950) and others have noted, the dyad does not reveal many of the complexities that are found in many assemblages" (Steiner, 1986, p.281). Further, dyads and triads would make the most efficient use of a critical shortage in subject availability.

Design

The design was a 2X2X2X2 factorial, mixed between and within groups study manipulating perceived utility of report information (utility confirmed or no
mention of information utility) and social norming to encourage sharing of unique information (norming intervention or control). Group size (dyads and triads) was a third between groups factor and information type (unique or shared) was the within groups factor. Both the utility and norming manipulations and their interaction were expected to have a significant effect on sharing of uniquely held information after the first mention. Predictions were not made about group size; it was manipulated in an effort to further understand the phenomenon. Information type was dummy coded and was expected to interact with norming and utility wherever those manipulations were effective.

**Manipulations**

The social norming manipulation consisted of a paragraph of instructions to group members urging them to be eager and willing to share (both mention and listen to) unique information. The utility manipulation consisted of a paragraph of instructions confirming the utility of the information from the reports to previous Rice students addressing the same task. Both manipulations proved effective in pilot testing. Subjects were placed at random in dyads or triads within the constraint of making the most efficient use of subject availability. Both shared and unique information was provided to each subject, at a ratio of 30 items of shared information to 6 items of unique information in each report. Shared and unique items were matched on importance and relevance and balanced to avoid bias.

**Predictions**

**Manipulations.** It was expected that the utility and social norming manipulations would significantly affect those measures intended as manipulation checks. Questionnaire items were administered which addressed
each manipulation, and it was expected that responses on these items would differ across conditions. Further, it was expected that more items would be marked "useful" on the checklist of perceived item utility by subjects receiving the utility manipulation than by other subjects.

Replication and extension of Stasser and colleagues' (1989) findings. It was expected that the major prediction of Stasser's information sampling model would be confirmed in this study, i.e. that more commonly held information would be discussed than uniquely held information. In other words, a higher proportion of the shared items would be mentioned at least once than the proportion of uniquely held items mentioned at least once. Because the results of Stasser, Taylor and Hanna's (1989) study did not support their prediction that repetition of unique information would be at a higher rate than that of shared information, repeat mentions in this study were expected to be mostly of shared information also. In other words, Stasser and his colleagues' (1989) results for first and repeated mentions of shared and uniquely held information were expected to be replicated here, at least in the "double-control" condition.

However, the two manipulations and their interaction were expected to increase the repeated mention of uniquely held information. It was expected that these manipulations, independently and in combination, would reduce group members' reticence to repeat uniquely held information. It was expected that explicit confirmation of utility of unique information would promote repeat sharing of that information, via reduction of concerns about its correctness, relevance, usefulness and importance. It was also expected that introduction of a social norm to encourage sharing of unique resources would motivate such sharing, increasing repeat mentions of unique information. Further, it was anticipated that subjects in the social norming condition might be even more
willing to repeatedly share known-useful information, resulting in an interaction between social norming and utility. These effects would ameliorate the differential treatment of unique and shared information on repeated mentions. This was expected for second and further mentions of unique information in groups of both sizes.

**Post-discussion checklists.** In order to explore why group members repeat information differentially, a checklist was used to gather subjects' perceptions about the information they read. The checklist was composed of two parts: an item recognition list and a measure of perceived utility of the information. Item recognition is discussed first, and then perceptions of utility will be addressed.

**Recognition.** One of the factors which governs mentioning information in a discussion is memory for the information. It is important to note that in this study, the stimulus information was left with the subjects throughout their discussion to minimize memory differences for information in general. However, to check for specific differences in information recognition, immediately following their discussions (and after the reports were taken from them) group members were given item checklists and asked to mark whether they recognized items from their information reports. On the group member checklists, subjects were asked to attempt to differentiate whether items had been "shared" or "unique" if they recognized them from their reports. It was expected that during group discussion, group members might have recognized which information was indeed unique and which was shared, especially if group process was affected by the manipulations. In this case, group members in utility, norming, and the interaction conditions might demonstrate a higher
recognition rate for unique information than those in the double-control condition.

Individuals who did not participate in group discussions made parallel recognition judgments which were intended to serve as a measure uncontaminated by group discussion. Their judgments related to the presence or absence of items from their reports; unique versus shared differentiation would have been meaningless for subjects who had been non-group members. Individual recognition was expected to be equivalent to that of group members, with a possible increase in recognition memory of group members due to salience from discussion of information.

Post-discussion utility judgments. Group members were then asked to rate the utility of each item of information from their reports. Individuals who did not participate in group discussions (and did not receive the manipulation) made parallel utility judgments which were intended to serve as comparison perceptions uncontaminated by group discussion. It was expected that subjects receiving the utility manipulation would perceive all of their information to be more useful than those group members and individuals who did not receive this manipulation. In other words, the total number of items marked useful would serve as a manipulation check for the utility manipulation. The following prediction was made: group members in the utility-confirmed condition were expected to rate utility of items significantly higher than other subjects, resulting in a main effect of the utility manipulation on these judgments. On the other hand, and more specifically, it was expected that group members in both the utility-confirmed condition and the social norming condition would be more likely to rate their uniquely held items "useful" than their control condition
counterparts. Interactions were expected between utility and information type as well as norming and information type.

 Utility judgments and discussion performance. From the perspective of group process, it was expected that group members would mention information at a higher rate if they perceived it to be useful. The following prediction resulted: perceived utility of unique items by group members (as indicated by their questionnaire responses) was expected to be positively related to the number of repeat mentions of those items in group discussion.

 Perceptions of the process. Group members were asked to respond to a three page questionnaire after their discussions, with questions related to member confidence in the information they were given and in the recommendation reached by their group, satisfaction with the group recommendation, group process issues such as appreciation for new ideas, listening to one another, and how acceptable it was to mention unique information. Questions were included to obtain estimates of time spent discussing positive versus negative and shared versus uniquely held information.

 It was anticipated that confirmation of information utility would be positively related to group member confidence in and satisfaction with their decision. Further, the social norming intervention was expected to increase information sharing and thus boost confidence in and satisfaction with the group decision. In other words, these items were expected to serve as manipulation checks. Also, it was expected that group members receiving either manipulation would perceive that they had spent more time discussing unique information than group members in the control condition.
In general, the data from the questionnaire were intended to provide an internal individual level perspective on the mechanism by which the unique and shared information was treated differently. It was expected that perceived process differences would be related to the manipulations.
Methods

Design and Subjects

Design. This study was designed as a 2X2X2X2 factorial, mixed between and within groups study. Factor A constituted a between groups variable of utility of report information (utility confirmed or no mention of information utility), factor B constituted a between groups variable of social norming to encourage sharing of unique information (norming intervention or no intervention), factor C was a between groups variable of group size (dyad or triad), and factor D was a within groups variable of information type (uniquely or commonly held).

Subjects. One hundred twenty-five Rice University undergraduate students (seventy-eight males and forty-seven females) participated in this study for credit in psychology courses or cash, with the stipulations that students must be native American English speakers and have not studied abroad or applied to study abroad. Twenty-one triads and twenty-five dyads were formed. Three groups were dropped from analyses, because two dyads did not follow directions and one triad included a subject who did not meet the stipulations for participation. Twelve subjects were tested to provide individual-level comparison data. Subjects were assigned to groups which were randomly distributed among the experimental conditions. No confounds of gender, race or motive resulted.

Procedure

The group task was to reach a recommendation on whether a study abroad program should be implemented at Rice. Experimental sessions began
with a seven minute independent reading of information materials by individuals seated with their groups, each member reading a different report. Reports were created with 30 items of information read by all group members (shared information) and six items of information held by any one member (uniquely held information). In three person groups, then, there were 30 shared items of information and a total of 18 uniquely held items. This information was pretested in an independent sample and balanced for importance and relevance, and matched to avoid bias\textsuperscript{1}. The subjects were all told that their reports differed within groups and that the reports were to be read for information to be used in their discussion.

Then the groups were instructed to share information and reach a decision, group members retaining their reports to control for differences in individual recall. General procedural instructions were given to the groups to structure their discussions. Specific instructions were also given depending upon experimental condition. The social norming groups received the general instructions plus additional instructions about norming, which consisted of a paragraph instructing group members to be eager and willing to share (both mention and listen to) unique information. The utility groups received the general instructions plus instructions about confirmation of item utility, which consisted of a paragraph confirming the utility of the information from the reports. The social norming by utility (interaction) groups received all

\textsuperscript{1} Nine graduate students rated a pool of items on a five point scale for relevance, salience, and importance for the task. They also indicated perceived positive or negative orientation of each item given the group task. To determine relevance, salience, and importance for each item, high and low ratings were dropped and the rest were averaged. Items falling in the middle of the range for salience, importance, and relevance were used in the stimulus readings, and the three stimulus reports were constructed of items with equivalent ratings to ensure their parallel nature. In addition, each report was constructed of equal numbers of positive, negative, and neutral items.
instructions, and the double-control groups received only the general instructions. Both manipulations had proven effective in pilot testing.

Discussions lasted for 30 minutes or until consensus was reached, and were audio-taped. Following the group discussion, subjects individually completed individual questionnaires regarding their confidence in the group recommendation, estimates of time spent discussing unique information, perceptions of group process, and questions about influence and leadership intended to serve as a baseline for future research. Subjects then completed item recognition checklists also intended to measure perceptions of the utility and uniqueness or "sharedness" of each of the items. Debriefing followed.

Individuals who signed up alone or who could not be placed in groups due to size limitations read the same materials as group members, in the presence of others and with the same expectations of performing the group task (in the case of those subjects who signed up alone, they read materials in the presence of confederates). They then completed the recognition checklists. These provide an uncontaminated, pre-discussion measure of item recognition and perceptions of item utility of items for comparison with the post-discussion measure yielded by group members. Debriefing followed.

Materials

Three versions of reports were created with 30 items of information read by all group members (shared information) and six items of information held by any one member (uniquely held information). In triads, all three reports were used, but in dyads only two reports were used. Appropriate counterbalancing was carried out to ensure that every report pairing was equally represented in each condition. Reports were constructed of information which had been
pretested in an independent sample and balanced for importance and relevance, and matched to avoid bias. All reports are found in Appendix A.

Cover pages on the reports gave the following information,

"The purpose of this experiment is to look at group process. In order for you to do this, you'll be discussing a potential issue for Rice University: whether or not to recommend that Rice should adopt a Study Abroad Program, where a semester of study at a foreign university would be a feature of the Rice experience. Currently, students can study abroad if they set the whole thing up themselves, but we are talking about an actual program here, where more of the details are decided by the university. Students coming to Rice would expect to participate in this program, although it would not be mandatory.

This report is intended to provide you with information to use in your discussion. It contains information from the National Student Abroad Association, based on summaries from returning students. In general, people know different things when they discuss an issue in a group. So in the interests of realism, we have not provided identical information in each of the reports, although the information you receive will not be in direct conflict with information others in your group receive. Plan to consider the information from this report in making your recommendation."

**Manipulations**

The manipulations were performed in the context of information about group process. This information was written into the discussion instructions given to the groups, depending upon experimental condition: social norming, utility, social norming by utility, and control. The basic instructions given to every group included the following paragraphs,

"Please discuss whether Rice should adopt a study abroad program where a semester of study at a foreign university would be a feature of the Rice experience.
1. Please share information
2. Please reach a recommendation: yes or no
3. If you decide yes, please discuss and make a group recommendation for details about how the program should
work in the following aspects: location & language, is it worthwhile?, benefits to students, student responsibilities
4. If you decide no, please discuss and decide the major reasons why not, considering the same four aspects. The reports are being left with you so that you can refer to them if you wish. Please remember to share information, reach a recommendation, and then list how the program should be structured or why you don't recommend it. After you have reached agreement on all of these things, please tell the experimenter.
At this time, please introduce yourselves to the tape, giving your name, and the report you read. Remember that your conversation will remain confidential."

Half of the groups received the social norming manipulation, consisting of the following paragraph of instructions in addition to the basic instructions,

"During your discussion, it is particularly valuable to the group for you to present any information you wish, especially the information you hold which was unique to your report. Remember that not all group members were given the same information, so don't hesitate to mention information even if you think no one else knows it. Every group member should be eager to hear and share new information. This will produce the best possible discussion in your group."

Factorially to the norming manipulation, half of the groups received the utility manipulation, consisting of the following paragraph of instructions in addition to the basic instructions,

"Group discussion for decision making differs from individual decision making in numerous ways, one of which is that information which may not seem useful in an individual decision frequently becomes relevant and useful during group interaction. The reports that you have read were carefully constructed of information relevant for group discussion of this task, and pretesting with Rice students like yourselves has indicated the information to be very useful in reaching a recommendation about a study abroad program. Specifically, these Rice students have demonstrated the relevance, validity, and utility of the information in these reports for discussions about study abroad in general, and for decisions about the details involved in setting up such a program."
Both manipulations had proven effective in pilot testing. All instructions are found in Appendix A.

**Dependent Measures**

Two levels of measure were obtained in this study. The discussions provided group and individual level behavioral measures. The questionnaires and checklists provided individual level measures of perceptions of process as well as perceptions and recognition of the stimulus materials.

**Tape recorded discussions.** The primary dependent measures in this study were the mentions of information as recorded in the taped group discussions. These were coded for mentions of unique and shared information by each group member. First mentions and repeat mentions were recorded for each individual, as well as discussion length and length of time to reach the decision.

**Questionnaires.** Group members were asked to respond to a three page questionnaire after their discussions. Questions related to member confidence in the information they were given and in the recommendation reached by their group, satisfaction with the group recommendation, group process issues such as appreciation for new ideas, listening to one another, and how acceptable it was to mention unique information, and questions indicating perceptions of percentage of time spent discussing positive versus negative and shared versus uniquely held information. Members also indicated how useful they thought their reports were, and they estimated how much information had been contributed from each report. Responses for most of the questions were made on nine point Likert scales, anchored at the end points and middle. In some cases, responses were made by estimating percentages. Questions for future research were also included, including items to measure perceived influence of
group members and time spent talking by each member. See Appendix A for the entire questionnaire.

**Recognition and utility checklists.** After completing the questionnaires, group members marked checklists for their perceptions of the utility of each item of information from their reports. They were also asked to make recognition judgments for each item and to indicate if items were perceived to be unique to their report or shared with other group members. These recognition checklists should not be compared to recognition tasks in the normal sense: the task used in this study was designed to gather information after the stimuli were read and then discussed. The point of the lists was more to demonstrate that information which was not equally mentioned (e.g. uniquely held information was expected to be mentioned less often than shared information) was nonetheless equally well remembered. In other words, the recognition task was an attempt to rule out recognition differences as a cause for differences in mentioning information.

The recognition lists and the utility lists contained the 30 shared items of information plus the 6 items unique to each group member (for a total of 18 items), as well as 12 distractor items not found in any of the reports. Two parallel versions of the checklist were created to balance possible effects of order of item presentation. Versions were counterbalanced across conditions in dyads and triads. No differences were found due to checklist version, so data were collapsed.

Individual subjects not included in groups were asked to complete recognition checklists and rate the utility of each item of information from their reports. This was intended to serve as a baseline pre-discussion measure for comparison with the post-discussion judgments made by group members: a measure of perceptions of item utility and recognition uncontaminated by group
discussion. The same two parallel forms were used for individuals, identical except that individuals were not asked to decide if items had been unique to their report or shared with other reports. A sample checklist is found in Appendix A.
Results

**Manipulation Checks**

**Manipulation of perception of information utility.** The utility manipulation was an attempt to affect resource use by increasing group member perceptions of information utility. The following instructions were given to half of the groups. "Group discussion for decision making differs from individual decision making in numerous ways, one of which is that information which may not seem useful in an individual decision frequently becomes relevant and useful during group interaction. The reports that you have read were carefully constructed of information relevant for group discussion of this task, and pretesting with Rice students like yourselves has indicated the information to be very useful in reaching a recommendation about a study abroad program. Specifically, these Rice students have demonstrated the relevance, validity, and utility of the information in these reports for discussions about study abroad in general, and for decisions about the details involved in setting up such a program." Half of the groups received no instructions about information utility.

A questionnaire item was included as a manipulation check, "How confident are you that the information in your report was useful?" Responses to this question were made on a nine point Likert scale where 1 was anchored "not at all confident," 5 was anchored "confident," and 9 was anchored "totally confident." A significant main effect of the manipulation was expected on the responses to this question. No main effect was found, $[F(1,98)=0.19, \text{ n.s.}]$.

Interestingly, the responses to this item were significantly affected by the three way interaction of group size with the two manipulations, $[F(1,98)=7.97,$
To investigate this interaction, separate analyses of variance were run on dyads and triads. Among dyad members no main effect of utility was observed, although the means were in the predicted direction, \([E(1,42)=0.16, \text{n.s.}]\). Among dyad members receiving the utility manipulation, the mean response to this item was 5.82; and among those not receiving the manipulation, the mean response was 5.67. However, for the dyads there was a significant effect of the interaction of the utility and norming manipulations \([E(1,42)=7.35, p<.01]\), such that the manipulation of utility increased perceived item utility in the absence of the norming condition, but decreased it in the presence of the norming manipulation.

No main effect of the utility manipulation on perceptions of item utility was observed among triad members, either, although the means were in the predicted direction, \([E(1,56)=0.03, \text{n.s.}]\). Among triad members receiving the utility manipulation, the mean response was 6.43, and among those not receiving the manipulation, 6.37. Among triad members, responses to this item showed no significant effect of the interaction of the utility and norming manipulations \([E(1,56)=0.91, \text{n.s.}]\).

Other evidence of the effectiveness of the manipulation was found in the total number of checklist items marked "useful" by subjects. A main effect for utility was found, \([E(1,98)=5.39, p<.05]\). Of the sixty items in the checklist, the mean number marked "useful" by the group members receiving the utility manipulation was 40.7, while the mean number so marked by those group members not receiving the manipulation was 37.5. As a baseline comparison, the mean number marked useful by individuals who did not participate in groups (and did not receive any utility information) was 36.0.
Manipulation of a social norm regarding mentioning unique information.

The norming manipulation was an attempt to change group norms about contributing new information to group discussion. Factorially to the utility manipulation, the following instructions were given to half of the groups. "During your discussion it is particularly valuable to the group for you to present any information you wish, especially the information you hold which was unique to your report. Remember that not all group members were given the same information, so don't hesitate to mention information even if you think no one else knows it. Every group member should be eager to hear and share new information. This will produce the best possible discussion in your group." Half of the groups received no instructions regarding social norming.

Effectiveness of the norming manipulation was demonstrated in behavioral differences of group members during pilot testing. Subjects receiving norming instructions made a concerted effort to find and share unique information in pilot groups. In addition, a questionnaire item was included as a manipulation check, "Was it acceptable to mention unique information in your group?" Responses to this question were made on a nine point Likert scale where 1 was anchored "not at all acceptable," 5 was anchored "neither acceptable nor unacceptable," and 9 was anchored "totally acceptable." The effect of norming itself was not significant, [F(1,98)=1.52, n.s.]. Interestingly enough the utility manipulation showed a significant main effect on responses to this question, [F(1,98)=4.94, p<.05]. The mean responses were 8.08 for those receiving the utility manipulation and 7.43 for those not receiving such instructions.
However, across all group members, the responses to this item were nearly significantly affected by the interaction of group size with the norming manipulation, $[E(1,98)=3.36, p<.07]$. To investigate this interaction, separate analyses of variance were run on dyads and triads. Among dyad members, responses to this item showed a nearly significant effect of the norming manipulation $[E(1,42)=3.79, p<.06]$. Among dyad members receiving the norming manipulation, the mean response was 8.08, and among those not receiving the manipulation: 7.18. Among triad members, responses to this item showed no effect of the norming manipulation $[E(1,56)=0.22, \text{n.s.}]$, means were 7.73 for those receiving the manipulation and 7.90 for those not receiving it. The manipulation tended to be effective in dyads but not in triads. Strangely, in triads, a significant effect of the utility manipulation on the responses to this question $[E(1,56)=5.60, p<.05]$ was found. Among triad members receiving the utility manipulation, the mean response was 8.23, and among those not receiving the manipulation: 7.40. No other interactions nor main effects were significant.

Coding the Tapes of Group Discussions

The audio tape recorded group discussions were coded for first and repeat mentions of information\(^2\). The procedure used replicates the procedure used by Stasser et al (1989) for coding information mentions as well as can be determined from their report. Coding of all tapes was completed by a single experimenter, whose consistency from beginning of coding to the end was

\(^2\)The procedure for coding the audio tape recorded group discussions involved creation of lists of critical phrases (for related methodology, see Levitt, 1956) specifically identifying the thirty shared items and the eighteen unique items from the stimulus reports. These lists were generated by the agreement of lists from four independent raters, and gave no indication which items had been uniquely held and which commonly held on the reports.
determined by the correlation of start- and finish- protocols of numbers of
mentions of each stimulus item in three groups. This correlation was .89. To
obtain high internal consistency, the experimenter trained and practiced before
the start of coding using nine group discussion tapes generated in pilot testing
for this study. Consistency was further facilitated by the experimenter's coding
all of the tapes in a continuous process over as short a time as possible, to
reduce subjective errors.

To determine interrater reliability, a second experimenter was similarly
trained in the coding process. Simultaneously with the first experimenter, he
coded three tapes at the start of coding and three tapes again at the end of
coding. Interrater reliability of .85 was determined from the correlation of the
two coders' protocols of numbers of mentions of each stimulus item in the six
groups. During coding, the experimenters were blind to experimental condition.

**Replication of Stasser's Paradigm**

Those groups which received no manipulations (the condition which
directly parallels Stasser's paradigm) were expected to replicate Stasser and
colleagues' (1989) findings, namely that commonly held information would be
discussed more often than uniquely held information, both first and later times
mentioned. These groups will be referred to as the "double control" groups.
The most simple and direct test of the replication involves testing only the
double control groups via a pairwise comparison t-test. Here, the mentions of
shared (M=.48) versus uniquely held (M=.30) information were significantly
different, [ t(10)= 6.18, p<.0001]. Stasser et al (1989) found a similar difference
between mentions of shared information (M=.45) and uniquely held information
(M=.18) mentioned $[E(1,75)= 401.22, p<.0001]$. Proportions were derived by dividing the number of mentions by the number of available items. ³

Of more relevance to the present research was the general ANOVA for manipulations of utility and norming as well as group size and information type. Given that the basic Stasser paradigm was replicated here, did the manipulations affect relative mentions of shared and unique information? On first mentions of information, where information is mentioned in a probabilistic manner, the manipulations were not expected to make a difference. Mixed design analyses of variance were conducted on the coded data from the tape protocols. In fact, neither utility nor norming had a significant effect on first mentions of information, for utility: $[E(1,35)= 0.04, \text{n.s.}]$, and for norming: $[E(1,35)= 0.82, \text{n.s.}]$. The effect of group size was not significant, $[E(1,35)= 0.36, \text{n.s.}]$. Information type was the only significant effect, $[E(1,35)= 65.51, p<.0001]$. Over all, the mean proportion of first mentions for shared information was .484, while the mean proportion of first mentions of unique information was .303. See Table 1 for means listed by condition.

³In the very few cases where a unique item was mentioned first by someone who had not read it in their report, that item was subtracted from the number of unique items available to the affected group member. In other words, the total available number of unique items would have been 5 rather than 6. In no case did this account for more than one item per group member.

⁴Because of the probabilistic nature of sampling, it was reasonable to expect differential mentions of unique and shared information between dyads and triads. The means of the two sizes of groups are given in Appendix B to demonstrate this phenomenon, although the four way interaction involving group size was not significant, $[E(1,35)=2.29, \text{n.s.}]$. Throughout the rest of the study there were a number of significant effects due to group size, but in most instances these effects were easily explainable by differences in available time and information between two and three person groups (i.e. in thirty minutes two persons can each speak more than three persons). Interactions involving group size will be reported in the text where appropriate, but because the results do not provide a consistent or particularly interesting story, detailed data relating to group size will be reported in Appendix B.
Table 1

Mean Proportion of Available Information First Mentioned in Groups by Condition.

<table>
<thead>
<tr>
<th>first mention of uniquea</th>
<th>no norming no utility n=11</th>
<th>no norming yes utility n=10</th>
<th>yes norming no utility n=11</th>
<th>yes norming yes utility n=10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.285 (.18)S</td>
<td>.367 (.19)</td>
<td>.295 (.15)</td>
<td>.267 (.08)</td>
</tr>
<tr>
<td>of shareda</td>
<td>.491 (.23)</td>
<td>.533 (.23)</td>
<td>.479 (.20)</td>
<td>.439 (.18)</td>
</tr>
</tbody>
</table>

a  overall means for unique and shared information differ. $E(1,35)$ = 65.51. $p<.0001$.
S standard deviations are reported in parentheses.

These findings are consistent with Stasser and his colleagues' (1989) findings that uniquely held items were less likely (18 percent) than commonly held items (45 percent) to be mentioned at least once in group discussion. The occurrence of such mentions can be expected to be strictly probabilistic. In other words, three people (or two in dyads) read the same item of shared information while only one person read each item of unique information. Therefore, if group members were sampling randomly from their available information, in any group there should have been three (or two in dyads) times the chance of a shared item's being mentioned to that of a unique item. Assuming the random sampling of information by group members, it was reasonable to expect no effects other than information type on first mention of information. In fact that was the case in this study. No other manipulations and none of the interactions involving information type had significant effects on first mention of information at the group level.
Second Mentions

Stasser, et al. (1989) had expected that items of uniquely held information would "receive more attention when they were mentioned", in other words, that second mentions would be a higher proportion of unique to shared information (Stasser, et al., 1989, p. 74). Their data did not bear out this expectation. It was more likely for shared information to be repeated ($M_1 = .34$) than for unique information ($M_2 = .26$), $F(1,73) = 10.39$, $p < .01$.

In the present study, it was expected that the utility and norming manipulations would increase the repetition of unique information, using the following logic. Although first mentions of a given item of information may be expected to be probabilistic, when information is repeated in conversation there may be factors other than probability governing the decision to re-mention. First, a group member may notice the novelty of information after a first mention. For example, a person may mention an item from his/her report and observe that others seem unfamiliar with it, or conversely, a person may hear an item from someone else and realize that this information was not in his/her report. Also, and referring to Figure 1, if the response of the group is supportive, then the item is likely to be repeated without further consideration. If the response of the group is not supportive, other considerations may enter in.

Second mentions of information. It is important to remember that in the case of repeated mentions, necessarily, the item must be first mentioned before a second mention is possible. In fact, if an item were not first mentioned, there could never be a second mention. Therefore, these data were "conditionalized" by dividing the number of items repeated by the number initially mentioned, i.e. if 12 shared items were mentioned at first by the group, and 3 were repeated,
then the conditionalized number of shared items repeated would be .25. All counts are reported as conditionalized values\(^5\). Because there were no interactions with group size, these data have been collapsed across group size.

The social norm of the group for exchanging novel information and the confirmation of information utility were manipulated in an attempt to uncover possible considerations group members might make as they think about repeating information in a non-supportive environment, specifically in an effort to explore differential group members' treatment of unique and commonly held information. It was expected that the two manipulations (utility and norming) and their interaction would increase the repetition of uniquely held information but not shared information. In other words, a three way interaction of norming, utility, and information type was expected for the second mention of information, with a two way interaction between utility and norming for unique information but not shared information. These interactions did not occur. The three way interaction was not significant, \(F(1,35)=0.06, \text{n.s.}\), and the two way interaction had no significant effects for unique information, \(F(1,35)=0.42, \text{n.s.}\). These mentions were significantly affected by information type, \(F(1,35)= 5.90, p<.05\). The mean proportion of second mentions of shared information was .549, while the mean proportion of second mentions of unique information was .432. Refer to Table 2 for the mean proportions of second mentions of uniquely held and shared information, listed by condition. Note that the unique and shared information cell means differ the most in the double control condition and are less different in the manipulated conditions. Figure 2 clearly demonstrates that

\(^5\) This is basically the same concept as proportionalizing the first mentions: it simply involves dividing the number of mentions by the number of items available.
Table 2

Mean Proportion of Available Information Repeatedly Mentioned in Groups by Condition: Second Mentions.

<table>
<thead>
<tr>
<th>second mention</th>
<th>no norming</th>
<th>no norming</th>
<th>yes norming</th>
<th>yes norming</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no utility</td>
<td>yes utility</td>
<td>no utility</td>
<td>yes utility</td>
</tr>
<tr>
<td>n=11</td>
<td>n=10</td>
<td>n=11</td>
<td>n=11</td>
<td></td>
</tr>
<tr>
<td>of unique&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.295 (.26)&lt;sup&gt;s&lt;/sup&gt;</td>
<td>.442 (.44)</td>
<td>.486 (.28)</td>
<td>.505 (.33)</td>
</tr>
<tr>
<td>of shared&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.537 (.17)</td>
<td>.587 (.10)</td>
<td>.549 (.19)</td>
<td>.526 (.22)</td>
</tr>
</tbody>
</table>

<sup>a</sup> Information type differs, [F(1,35)= 5.90, p<.05].

<sup>s</sup> Standard deviations are reported in parentheses.

the manipulations were increasing the second mentions of unique information while leaving shared information relatively unchanged.

**Total number of repeat mentions of information.** Also, repeated mentions of information can provide information about sheer number of items repeated at least once (second mentions) or about total times items are repeated (totals). Table 3 gives the total number of times information was repeated in this study. This measure thus included third, fourth, and so on mentions as well as second mentions. Again such data were conditionalized<sup>6</sup> by first mention.

<sup>6</sup> If proportionalizing or conditionalizing involved division by zero, the resulting missing value was replaced with zero for further analyses.
Figure 2. Mean Proportion of Second Mentions of Available Information in Groups, by Condition and Information Type.\(^7\)

Table 3

<table>
<thead>
<tr>
<th>total repeat mentions</th>
<th>no norming</th>
<th>no norming</th>
<th>yes norming</th>
<th>yes norming</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no utility</td>
<td>yes utility</td>
<td>no utility</td>
<td>yes utility</td>
</tr>
<tr>
<td>n=11</td>
<td>n=10</td>
<td>n=11</td>
<td>n=11</td>
<td></td>
</tr>
<tr>
<td>of unique</td>
<td>.545 (.59)(^5)</td>
<td>1.79 (2.27)</td>
<td>1.33 (1.38)</td>
<td>.962 (.74)</td>
</tr>
<tr>
<td>of shared</td>
<td>.988 (.45)</td>
<td>1.13 (.24)</td>
<td>1.00 (.47)</td>
<td>.928 (.57)</td>
</tr>
</tbody>
</table>

\(^5\) Standard deviations are reported in parentheses.

\(^7\) In this graph and the parallel ones which follow, the second pairs of bars (labelled "utility") represents the condition which received utility instructions but not norming instructions, while the third pair (labelled "norming") represents the condition which received norming instructions but not utility instructions.
Once again, a three way interaction of utility, norming, and information type was expected. This interaction was not significant, \( F(1,35)=2.47,\text{n.s.} \). See Figure 3 for a graph of these means. A two way interaction of the utility and norming manipulations was expected to affect repeated mentions of unique information especially. In fact, as shown in Figure 3, the two way interaction of utility and norming yielded a nearly significant effect on uniquely held information, \( F(1,35)=3.59,\text{p<.07} \). This interaction was not as predicted, however. The utility manipulation increased repeated mentions of unique information in the absence of the norming manipulation and decreased them in the presence of the norming instructions.\(^8\) Further, there was no significant main effect of information type for total conditionalized repeat mentions of information, \( F(1,35)=0.41,\text{n.s.} \).

Note specifically that in both Tables 2 and 3 the double control cell mean for unique information is much lower than the other cells of unique information. This pattern is not observed for shared information; those means being virtually unchanged from one condition to another. Also, the means for repeated mentions of unique and shared information are very similar in the utility by norming cells in Tables 2 and 3. Apparently the utility confirmation and social norming interventions succeeded in erasing the difference between unique and shared information for repeated mentions of information. Over all, the mean conditionalized number of total repeats of shared information was 1.01, while the mean for total repeats of unique information was 1.14. This indicates that

---

\(^8\) This (and the utility by norming interactions affecting mentions of information that follow) could likewise be described in terms of the effect of the norming manipulation to increase the dependent measure in the absence of the utility intervention and decrease that measure in the presence of utility confirmation. However, the choice was made to describe them all in terms of the effect of utility because that manipulation seemed more consistent.
group members tended to repeat unique information somewhat more than shared information in this study. Remember however, that conditionalized second mentions were still significantly affected by information type, \( F(1,35) = 5.90, p < .05 \). The mean proportion of second mentions of shared information was .549, while the mean proportion of second mentions of unique information was .432. Integrating the information from these two variables suggests that group members were returning to shared information more often than unique information. However, when unique information was returned to, it tended to be repeated more often. It is not possible to compare these findings with those of Stasser et al. (1989), because they did not report total numbers of repeat mentions.

![Figure 3](image_url)

**Figure 3.** Mean Proportion of Available Information Repeatedly Mentioned in Groups by Condition and Information Type.
Reduction of the "Stasser effect". In addition to addressing possible mechanisms for why group members mention unique information at a lower rate than shared information, these data also suggest ways in which to diminish the phenomenon. As expected, the phenomenon persists for first mentions of information, unaffected by the manipulations. However, in the manipulated conditions, the phenomenon is reduced for second and total repeat mentions of information. Specifically, in the double control condition, t-tests of the differences between unique and shared information mentions were significant for first mentions, \( t(10) = 6.18, p < .0001 \), as well as for second and repeated mentions, \( t(10) = 3.13, p < .05 \), and \( t(10) = 1.94, p < .09 \), respectively. Yet, in the utility and no-norming condition, t-tests of the differences between unique and shared information mentions were significant for first mentions, \( t(9) = 3.12, p < .05 \), but not for second or repeated mentions, \( t(9) = 1.10, \text{n.s.} \), and \( t(9) = -0.98, \text{n.s.} \), respectively. Also, in the norming and no utility condition, t-tests of the differences between unique and shared information mentions were significant for first mentions, \( t(10) = 5.22, p < .001 \), but not for second and repeated mentions, \( t(10) = 0.69, \text{n.s.} \), and \( t(10) = -0.77, \text{n.s.} \), respectively. Finally, in the utility and norming condition, t-tests of the differences between unique and shared information mentions were significant for first mentions, \( t(10) = 3.09, p < .05 \), but not for second and repeated mentions, \( t(10) = 0.20, \text{n.s.} \), and \( t(10) = -0.13, \text{n.s.} \), respectively.

Individual Group Members

Information mentioned by group members at the individual level.

Because the decision to respond in conversation is made at the individual level (granted, it is made in the context of the group), analyses were also performed
on the probability of first mentions and conditionalized second and total mentions at the individual level. These data are central to this research effort, and represent more than just an additional level of analysis: a second pass through the analyses will provide new information about the phenomenon under study. Given that the group level data from the tape recordings were composites of mentions among group members, more specific information about individual choices to mention or withhold information is available from the individual level data. For example, a given item of information may be repeated five times in a group, but four of those repeats may be by the same individual. Or, although an item may only be mentioned for the first time once in a group, only one individual may mention it first. For another example, if a group member repeated a particular item of his or her own unique information, that represents an individual choice, whereas such information is relatively meaningless at the group level. These differences between group and individual levels of analysis provide further insight into what happens during the communication of information in groups. Because Stasser's research does not address the phenomenon at the individual level, no comparisons with his findings are possible.

Also, it is to be expected that the additional statistical power gained by analyses at the individual level will provide a stronger test of the manipulations than those at the group level. Means are listed by condition for all group members in Table 4.
### Table 4

Mean Proportion of Available Information Mentioned by Group Members by Condition. Conditionalized on Availability.

<table>
<thead>
<tr>
<th>first mention</th>
<th>no norming</th>
<th>no utility</th>
<th>n=27</th>
<th>yes utility</th>
<th>n=27</th>
<th>yes norming</th>
<th>no utility</th>
<th>n=27</th>
<th>yes utility</th>
<th>n=27</th>
</tr>
</thead>
<tbody>
<tr>
<td>of unique^a</td>
<td>.290 (.23)</td>
<td>.364 (.21)</td>
<td>.305 (.18)</td>
<td>.265 (.20)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of shared^a</td>
<td>.200 (.18)</td>
<td>.213 (.12)</td>
<td>.194 (.14)</td>
<td>.178 (.14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>second mention</th>
<th>no norming</th>
<th>no utility</th>
<th>n=27</th>
<th>yes utility</th>
<th>n=27</th>
<th>yes norming</th>
<th>no utility</th>
<th>n=27</th>
<th>yes utility</th>
<th>n=27</th>
</tr>
</thead>
<tbody>
<tr>
<td>of unique</td>
<td>.192 (.20)</td>
<td>.353 (.38)</td>
<td>.320 (.29)</td>
<td>.308 (.24)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of shared</td>
<td>.302 (.14)</td>
<td>.355 (.15)</td>
<td>.331 (.21)</td>
<td>.311 (.20)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>total mentions</th>
<th>no norming</th>
<th>no utility</th>
<th>n=27</th>
<th>yes utility</th>
<th>n=27</th>
<th>yes norming</th>
<th>no utility</th>
<th>n=27</th>
<th>yes utility</th>
<th>n=27</th>
</tr>
</thead>
<tbody>
<tr>
<td>of unique</td>
<td>.233 (.25)</td>
<td>.716 (1.0)</td>
<td>.540 (.71)</td>
<td>.386 (.35)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of shared</td>
<td>.401 (.25)</td>
<td>.451 (.21)</td>
<td>.410 (.28)</td>
<td>.380 (.29)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^a overall means for information type differ, [F(1,98)=33.61, p<.0001].

^s standard deviations are reported in parentheses.

**First mentions.** Information type was the only significant effect across all group members, [F(1,98)=33.61, p<.0001]. In contrast with the group level, at the individual level the proportion of unique information mentioned was higher than that for commonly held information. See Table 4 for means. Figure 4
demonstrates that individuals in this study were reporting a higher frequency of their unique information than their commonly held information, a result which is contradictory to the expectations of a purely probabilistic model.

Figure 4. Mean Proportion of First Mentions of Available Information by Group Members, by Condition and Information Type.

Second mentions. This is the individual level set of analyses which tests the effects of the manipulations on second mentions of information. The source table is found in Table 5. The primary prediction was that of a significant three way interaction (utility by norming by information type) on second mentions. This interaction was not significant, $[\text{F}(1,98)=1.01, \text{n.s.}]$. The graph is found in Figure 5, where the unique and shared means appear different only in the double control condition.
Table 5

Source Table for Second Mentions of Available Information by Group Members.

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>utility</td>
<td>1</td>
<td>0.116</td>
<td>1.86</td>
<td>0.1758</td>
</tr>
<tr>
<td>norming</td>
<td>1</td>
<td>0.020</td>
<td>0.32</td>
<td>0.5718</td>
</tr>
<tr>
<td>group size</td>
<td>1</td>
<td>0.790</td>
<td>12.66</td>
<td>0.0006</td>
</tr>
<tr>
<td>utility*norming</td>
<td>1</td>
<td>0.245</td>
<td>3.93</td>
<td>0.0502</td>
</tr>
<tr>
<td>size*utility</td>
<td>1</td>
<td>0.001</td>
<td>0.02</td>
<td>0.8918</td>
</tr>
<tr>
<td>size*norming</td>
<td>1</td>
<td>0.132</td>
<td>2.12</td>
<td>0.1482</td>
</tr>
<tr>
<td>size<em>utility</em>norming</td>
<td>1</td>
<td>0.105</td>
<td>1.69</td>
<td>0.1972</td>
</tr>
<tr>
<td>subject(size<em>utility</em>norming)</td>
<td>98</td>
<td>6.112</td>
<td></td>
<td></td>
</tr>
<tr>
<td>information type</td>
<td>1</td>
<td>0.041</td>
<td>0.98</td>
<td>0.3237</td>
</tr>
<tr>
<td>utility*information type</td>
<td>1</td>
<td>0.038</td>
<td>0.90</td>
<td>0.3443</td>
</tr>
<tr>
<td>norming*information type</td>
<td>1</td>
<td>0.040</td>
<td>0.96</td>
<td>0.3285</td>
</tr>
<tr>
<td>group size*information type</td>
<td>1</td>
<td>0.043</td>
<td>1.02</td>
<td>0.3140</td>
</tr>
<tr>
<td>utility<em>norming</em>info type</td>
<td>1</td>
<td>0.042</td>
<td>1.01</td>
<td>0.3171</td>
</tr>
<tr>
<td>size<em>utility</em>info type</td>
<td>1</td>
<td>0.029</td>
<td>0.69</td>
<td>0.4069</td>
</tr>
<tr>
<td>size<em>norming</em>info type</td>
<td>1</td>
<td>0.060</td>
<td>1.42</td>
<td>0.2357</td>
</tr>
<tr>
<td>size<em>utility</em>norming*info</td>
<td>1</td>
<td>0.064</td>
<td>1.53</td>
<td>0.2191</td>
</tr>
<tr>
<td>info<em>subject(size</em>utility*norm)</td>
<td>98</td>
<td>4.102</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The interaction of utility and norming manipulations \([F(1,98)=3.93, \ p<.06]\) was nearly significant, but not with the expected additive effect. The utility manipulation increased second mentions when norming was not manipulated and reduced them slightly when norming was manipulated. Further, a two way interaction of utility and norming had been expected for the second mentions of unique information. This interaction was not significant, \([F(1,102)=2.43, \ n.s.]\). Finally, there was no main effect of information type, \([F(1,98)=.98, \ n.s.]\). See Table 4 for means.

![Interaction of Utility and Norming graph](image)

**Figure 5.** Mean Proportion of Second Mentions of Available Information by Group Members, by Condition and Information Type.

Group size also produced a significant effect on the second mentions of information, \([F(1,98)=12.66, \ p<.001]\). Results for dyad members versus triad members are presented in detail in Appendix B.
Total repeat mentions. Also of critical interest in the model are the total repeat mentions of information by group members. For these mentions (totals), there were a number of significant effects. See Table 6 for source table. This set of analyses is also directly associated with the test of the proposed model. The main interaction expected was the three way interaction involving utility, norming, and information type, and this interaction was significant, \( [E(1,98)=7.14, p<.01] \). See Figure 6 for a plot of this interaction where it is clear that the interaction was produced by the effects of the manipulations on the unique information, with shared information remaining relatively unaffected. Also, the interaction of utility and norming had a significant effect on total repeat mentions in the overall model, \( [E(1,98)=8.14, p<.01] \). Once again, utility increased repeat mentions in the absence of the norming intervention and decreased them in the presence of norming. For unique information alone, the interaction of utility and norming was significant, \( [E(1,102)=6.57, p<.05] \), such that utility increased repeat mentions of unique information in the absence of norming but decreased them somewhat in the presence of norming instructions.

Once again, the effect of information type was eliminated, even reversed, \( [E(1,98)=1.46, \text{ n.s.}] \). Means are shown in Table 4, by condition and information type.
Table 6

Source Table for Total Repeat Mentions of Available Information by Group Members.

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>utility</td>
<td>1</td>
<td>0.452</td>
<td>1.79</td>
<td>0.1838</td>
</tr>
<tr>
<td>norming</td>
<td>1</td>
<td>0.022</td>
<td>0.09</td>
<td>0.7662</td>
</tr>
<tr>
<td>group size</td>
<td>1</td>
<td>2.986</td>
<td>11.84</td>
<td>0.0009</td>
</tr>
<tr>
<td>utility*norming</td>
<td>1</td>
<td>2.053</td>
<td>8.14</td>
<td>0.0053</td>
</tr>
<tr>
<td>size*utility</td>
<td>1</td>
<td>0.001</td>
<td>0.00</td>
<td>0.9604</td>
</tr>
<tr>
<td>size*norming</td>
<td>1</td>
<td>0.201</td>
<td>0.80</td>
<td>0.3742</td>
</tr>
<tr>
<td>size<em>utility</em>norming</td>
<td>1</td>
<td>0.772</td>
<td>3.06</td>
<td>0.0833</td>
</tr>
<tr>
<td>subject(size<em>utility</em>norming)</td>
<td>98</td>
<td>24.714</td>
<td></td>
<td></td>
</tr>
<tr>
<td>information type</td>
<td>1</td>
<td>0.272</td>
<td>1.46</td>
<td>0.2299</td>
</tr>
<tr>
<td>utility*information type</td>
<td>1</td>
<td>0.342</td>
<td>1.74</td>
<td>0.1904</td>
</tr>
<tr>
<td>norming*information type</td>
<td>1</td>
<td>0.005</td>
<td>0.03</td>
<td>0.8678</td>
</tr>
<tr>
<td>group size*information type</td>
<td>1</td>
<td>0.437</td>
<td>2.34</td>
<td>0.1292</td>
</tr>
<tr>
<td>utility<em>norming</em>info type</td>
<td>1</td>
<td>1.332</td>
<td>7.14</td>
<td>0.0088</td>
</tr>
<tr>
<td>size<em>utility</em>info type</td>
<td>1</td>
<td>0.025</td>
<td>0.13</td>
<td>0.7164</td>
</tr>
<tr>
<td>size<em>norming</em>info type</td>
<td>1</td>
<td>0.085</td>
<td>0.45</td>
<td>0.5019</td>
</tr>
<tr>
<td>size<em>utility</em>norming*info</td>
<td>1</td>
<td>1.317</td>
<td>7.06</td>
<td>0.0092</td>
</tr>
<tr>
<td>info<em>subject(size</em>utility*norm)</td>
<td>98</td>
<td>18.278</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 6. Mean Proportion of Total Repeat Mentions of Available Information by Group Members, by Condition and Information Type.

Again, the effect of group size was significant, $[E(1,98)=11.84, p<.001]$, although qualified by a significant four way interaction of utility, norming, information type and group size, $[E(1,98)=7.06, p<.01]$. While it is hard to interpret such interactions, in this case the three way interaction was supported more clearly for dyad members. Once again, the expected pattern was not produced. The three way interaction of utility by norming by information type was significant among dyad members, such that utility increased the repeat mentions of unique information in the absence of norming and decreased them in the presence of norming, but no differences were observed for shared information, $[E(1,42)=7.07, p<.05]$. Also among dyad members only, the interaction of utility and norming was significant, $[E(1,42)=5.78, p<.05]$. Utility confirmation increased total repeat mentions in the absence of norming but decreased them in the presence of norming instructions. Among triad
members, the interaction of utility and information type approached significance, $[E(1,56)=3.98, p<.06]$. Utility confirmation increased total repeat mentions in the absence of norming but left them relatively unaffected in the presence of norming instructions. Refer to Appendix B for these group size data.

**Whose Information was Repeated?**

In addition to the variables also tested at the group level, other information can be derived from the individual decisions to mention or withhold information. For example, it is informative to note the likelihood of an individual's responding to his/her own earlier statement or to information presented by others. Clearly, this is an individual level phenomenon, and one which may provide insight into the mechanism at work here. To study this, the number of individuals' repeats of their own (own-repeat) and others' first mentions (other-repeat) were counted, and then conditionalized on availability. Means are found in Table 7, listed by condition and information type.

**Repeats of members' own first mentioned information.** Although the three way interaction of utility, norming, and information type was only marginally significant on this measure, $[E(1,98)=3.03, p<.09]$, own-repeats were significantly affected by utility, $[E(1,98)=4.14, p<.05]$, as predicted. The mean proportion of own-repeats for group members receiving utility confirmation was .378, and for those not receiving such confirmation, .258. Looking at the unique information only, the effect of the interaction of utility and norming was nearly significant on the repeats of people's own uniquely held information, $[E(1,102)=2.90, p<.10]$, such that utility increased members' repeat mentions of their own unique information in the absence of norming instructions and decreased such mentions in the presence of norming. This effect is clearly
Table 7

Mean Proportion of Own- and Other Repeats by Condition, Conditionalized on Availability.

<table>
<thead>
<tr>
<th>own-repeats</th>
<th>no norming</th>
<th>no norming</th>
<th>yes norming</th>
<th>yes norming</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no utility</td>
<td>yes utility</td>
<td>no utility</td>
<td>yes utility</td>
</tr>
<tr>
<td></td>
<td>n=27</td>
<td>n=25</td>
<td>n=27</td>
<td>n=27</td>
</tr>
<tr>
<td>of unique</td>
<td>.200 (.34)</td>
<td>.583 (1.1)</td>
<td>.361 (.58)</td>
<td>.309 (.40)</td>
</tr>
<tr>
<td>of shared</td>
<td>.171 (.27)</td>
<td>.261 (.28)</td>
<td>.299 (.28)</td>
<td>.368 (.48)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>other-repeats</th>
<th>no norming</th>
<th>no norming</th>
<th>yes norming</th>
<th>yes norming</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no utility</td>
<td>yes utility</td>
<td>no utility</td>
<td>yes utility</td>
</tr>
<tr>
<td></td>
<td>n=27</td>
<td>n=25</td>
<td>n=27</td>
<td>n=27</td>
</tr>
<tr>
<td>of unique</td>
<td>.271 (.40)</td>
<td>1.02 (1.4)</td>
<td>.917 (1.1)</td>
<td>.431 (.72)</td>
</tr>
<tr>
<td>of shared</td>
<td>.726 (.46)</td>
<td>.687 (.55)</td>
<td>.559 (.42)</td>
<td>.495 (.34)</td>
</tr>
</tbody>
</table>

S standard deviations are reported in parentheses.

shown in Figure 7. See Table 7 for means listed by condition and information type.

As might be expected and perhaps simply due to time-sharing constraints, group size significantly affected this variable, \[ E(1, 198) = 8.00, \ p < .01, \] with dyad members repeating their own information at a rate of .426, and triad members, .234. Among dyad members, own-repeats were nearly significantly affected by the interaction of utility and norming, \[ E(1, 42) = 3.61, \ p < .07, \] with the now familiar pattern of the utility manipulation's increasing mentions in the absence of norming and having no effect in the presence of norming. Own-repeats were also significantly affected among dyad members by a main effect
of utility, \( [E(1,42)=4.32, p<.05] \), as predicted. There were no significant effects on own-repeats among triad members.

![Utility bar chart](image)

Figure 7. Mean Proportion of Own-Repeats of Available Information by Group Members, by Condition and Information Type.

**Group member repeats of others' first mentioned information.** Among all group members, other-repeats were significantly affected by the three way interaction of utility by norming by information type, \( [E(1,98)=4.99, p<.05] \), and the utility by norming interaction, \( [E(1,98)=5.72, p<.05] \). The now familiar pattern of the utility-norming interaction was observed, with a stronger display of the pattern evident in repeats of others' uniquely held information. In other words, the interaction was produced by the effects of the manipulations on the unique information. Means are found in Table 7. Testing the unique cells only from the bottom half of Table 7, the interaction of utility and norming yielded the usual significant effect on the repeat mentions of others' unique information, \( [E(1,102)=5.46, p<.05] \). See Figure 8 for a graph of this effect.
Figure 8. Mean Proportion of Other-Repeats of Available Information by Group Members, by Condition and Information Type.

Group size once again caused a significant difference, \([E(1,98)=9.27, p<.01]\). Dyad members were more likely to repeat others’ first mentioned information \((M=.629)\) than were triad members \((M=.385)\). Among dyad members, other-repeats were nearly significantly affected by the interaction of utility and norming, \([E(1,42)=3.92, p<.06]\), such that utility increased mentions in the absence of norming and decreased them in the presence of norming. This was qualified among dyad members by the three way interaction of utility, norming, and information type, \([E(1,42)=3.86, p<.06]\) such that the now familiar pattern of effects of utility and norming was more pronounced on repeats of others' uniquely held information than on shared information. Among triad members, other-repeats were nearly significantly affected by the utility by information type interaction, \([E(1,56)=3.49, p<.07]\), and by information type, \([E(1,56)=6.10, p<.05]\), with uniquely held information of others repeated at a rate of .306, and shared information first mentioned by others repeated at a rate of .463. See Appendix B for means by group size.
Reduction of the "Stasser effect". Once again it was possible to test these data for effectiveness in diminishing the "Stasser effect" phenomenon. At the individual level, the phenomenon was reversed for first mentions of information, both in the double control and manipulated conditions. In each case, individual group members were mentioning their unique information at a higher rate than their commonly held information, without knowing which information was which. Specifically, in the double control condition, a $t$-test of the difference between unique and shared information was significant for first mentions, [$t(26)=-2.43$, $p<.05$]. In the utility/no-norming condition, the $t$-test of the difference between unique and shared information was also significant for first mentions, [$t(24)=-4.09$, $p<.001$], and in the norming/no-utility condition, the $t$-test of the difference between unique and shared information was also significant for first mentions, [$t(26)=-3.73$, $p<.001$]. Finally, in the utility/norming condition, a $t$-test of the difference between unique and shared information was significant for first mentions, [$t(26)=-2.10$, $p<.05$],

In the double control condition, the phenomenon was reversed but still showed a significant difference for second and total repeat mentions of information, [$t(26)=2.31$, $p<.05$], and [$t(26)=2.23$, $p<.05$], respectively. Individuals were more likely to repeat shared than uniquely held information in the double control condition. However, in the manipulated conditions, the phenomenon was reduced for second and total repeat mentions of information. In the utility/no norming condition, there was no difference of information type for second and repeated mentions, [$t(24)=0.02$, n.s.], and [$t(24)=-1.40$, n.s.], respectively. In the norming/no utility condition, the same trend was observed: no difference of information type for second or repeated mentions, [$t(26)=0.21$, n.s.].
n.s.], and [t(26) = -1.00, n.s.], respectively. Finally, in the utility/norming condition, the same pattern appeared again, showing even less difference between the types of information for second and repeated mentions, [t(26) = 0.05, n.s.], and [t(26) = -0.08, n.s.], respectively.

Using this same pairwise comparison test, it appears that the difference in group members' repeating their own and other's uniquely and commonly held information was also reduced by these manipulations. First, in the double-control condition, information type differed for people repeating their own information, [t(26) = -1.89, p < .08], such that group members were somewhat but not significantly more likely to repeat their own unique information than their commonly held information. In that same condition, group members were more likely to repeat the uniquely held information first mentioned by others, [t(26) = 2.81, p < .05]. Repeat mentions of themselves and others were not significantly different in any manipulated condition, however. Repeated mentions of a group member's own information did not differ by information type in the utility/ no norming condition, [t(24) = -1.72, p < .10], the norming/ no utility condition, [t(26) = 0.06, n.s.], and the utility/norming condition, [t(26) = 0.33, n.s.]. Finally, repeated mentions of others' information did not differ by information type in the utility/ no norming condition, [t(24) = -0.79, n.s.], the norming/ no utility condition, [t(26) = 0.52, n.s.], or the utility/norming condition, [t(26) = 0.38, n.s.].
Utility Ratings

Group members in the utility-confirmed condition were expected to rate utility of all items on a 60 item checklist\(^9\) significantly higher than other subjects, resulting in a main effect of the utility manipulation on these judgments. As mentioned earlier this was a manipulation check, and confirmation of information utility produced a significant effect on total number of items marked "useful" on the checklist, \([E(1,98)=5.39, p<.05]\). The mean number marked "useful" by the utility confirmed subjects was 40.69, and the mean number so marked by those group members not receiving the manipulation was 37.50. For comparison, the mean number so marked by individuals not receiving the manipulation was 36.00.

Among group members only, a significant interaction effect was found of norming and information type, \([E(1,98)=9.63, p<.01]\), but there was no significance of the utility by information type interaction, \([E(1,98)=0.01, \text{n.s.}]\). See Table 8 for proportionalized means of all information marked "useful". There were main effects of utility, \([E(1,98)=4.62, p<.05]\) (with a proportionalized\(^{10}\) mean response of .76 among those group members who received the utility manipulation and .69 among those who did not), norming, \([E(1,98)=5.99, p<.05]\) (with a proportionalized mean response of .69 among those group members who received the norming manipulation and .76 among those who did not), and information type, \([E(1,98)=14.46, p<.001]\) (with a mean response rate of .76 for shared information and .69 for uniquely held information).

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\(^9\)Details about construction of the checklist are found in the recognition checklist section.

\(^{10}\) Responses were proportionalized for comparison of shared with unique items.
More specifically, a prediction was made with regard to the unique items. It was expected that group members in the utility and norming conditions would be more likely to rate their uniquely held items useful than their counterparts who did not receive the manipulations. The means in Table 8 indicate that this prediction was supported for the utility but not for the norming manipulation: the results show an interesting yet perplexing difference between the perceptions of usefulness of uniquely held and commonly held items. The perceived usefulness of commonly held items was affected by the utility manipulation, $E(1,102)=5.61$, $p<.05$, and not affected at all by the norming manipulation, $E(1,102)=0.60$, n.s. Of the thirty commonly held items in the checklist, the mean number marked "useful" by the utility confirmed subjects was 23.9 (a proportionalized response rate of .80 as shown in Table 8), and the mean number so marked by the subjects not receiving that manipulation was 21.8. On the other hand, the perceived usefulness of uniquely held items was affected by the norming manipulation to a greater extent than the utility manipulation. Utility of uniquely held information was significantly affected by the norming manipulation, $E(1,102)=8.29$, $p<.05$, and also affected somewhat by the utility manipulation, $E(1,102)=3.15$, $p<.10$. Of six uniquely held items, the mean marked "useful" by members of normed groups was 3.8, and the mean so marked by group members not receiving that manipulation was 4.5.

Perceived utility of unique items and discussion performance. Perceived utility of unique items by group members was expected to be positively related to the number of repeat mentions of those items. In fact, the correlation between these measures was .15, not significant but in the predicted direction.
Table 8

Mean Proportionalized Totals of Information Deemed "Useful" by Group Members, by Condition and Information Type.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Utility&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Control&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Total Useful Items&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.68</td>
<td>.12</td>
</tr>
<tr>
<td>Shared Useful Items&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.80</td>
<td>.13</td>
</tr>
<tr>
<td>Unique Useful Items</td>
<td>.73</td>
<td>.21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>Social Norming&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Control&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Total Useful Items</td>
<td>.63</td>
<td>.16</td>
</tr>
<tr>
<td>Shared Useful Items</td>
<td>.75</td>
<td>.18</td>
</tr>
<tr>
<td>Unique Useful Items&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.63</td>
<td>.25</td>
</tr>
</tbody>
</table>

<sup>a</sup> n=52.

<sup>b</sup> n=54.

* means differ p < 0.05.

Recognition Checklist

Hit and false alarm rates. A recognition checklist was completed by group members after their discussion. These lists were comprised of all items present in all three reports (30 shared items plus the 6 items unique to each report, making a total of 48 items) plus 12 distractor items which were not
present in any of the reports.\textsuperscript{11} Group members marked an item as being present in their reports (either thought to be present uniquely in their report or shared in all reports) or not mentioned in their reports. To test the expectation that the manipulations would differentially affect uniquely held and shared information, hit rates\textsuperscript{12} and false alarm rates\textsuperscript{13} for shared and uniquely held items were scored from these checklists and were subjected to a general linear model regression using the same 2x2x2x2 model as used for the discussion data.

It was expected that if the utility and norming manipulations focused attention on uniquely held information, group members would demonstrate better recognition of uniquely held items in those groups which received manipulations. This was not indicated in the hit rate results, which showed no significant differences. See Table 9 for mean values; all are uniformly high for hit rate (ranging from .823 to .853), perhaps indicating a ceiling effect.

\textsuperscript{11} None of the distractor items were mentioned in the group discussions, so they were "new" items to every subject. For dyads and triads, individuals saw 30 shared "old" items and 6 unique "old" items which they had previously read from their reports. Calculation of hits was based upon these numbers. Twelve distractor items were "new" to every group member, but the "old" items unique to one group member were necessarily "new" for the other group members, and in the case of dyads, 6 items of unique information from the report which was not read by either group member were also "new" to both members. Calculation of false alarms was complicated by the fact that some otherwise "new" items (unique to other members) were mentioned in discussion, and therefore might be mistaken for "old" items. False alarm rates were calculated to consider this occurrence, using the following decision rules: for unique false alarms, unique lures heard in conversation and marked "old" comprised the false alarm score; for shared false alarms, the false alarm score from only "new" shared items was used. This is a complicated concept, and a number of approaches could be used, but this method was explainable, answered the research question most directly, produced interpretable results, and yielded a PrBr correlation of -.08 (n.s.) indicating relative orthogonality of the two measures (Snodgrass & Corwin, 1988). PrBr is discussed later in the text.

\textsuperscript{12} Hit rates and false alarm rates were corrected using the formula recommended by Snodgrass and Corwin (1988). This formula is recommended to preclude computational difficulties encountered when the hit rate is 1.0 or false alarm rate is 0 (resulting z scores equal infinity without the correction). Simply put, the formula is number "old" (or "new" for false alarms) correctly marked plus .5, divided by the number "old" (or "new for false alarms) plus 1.

\textsuperscript{13} Correct rejection rates are dependent upon false alarm rates, as are miss rates dependent upon hit rates. Consequently, no new information is obtained by testing miss rates and correct rejection rates (see Klatzky, 1980; Snodgrass & Corwin, 1988).
Table 9

Mean Values for Hit and False Alarm Rates, by Condition.

<table>
<thead>
<tr>
<th></th>
<th>no norming no utility n=27</th>
<th>no norming yes utility n=25</th>
<th>yes norming no utility n=27</th>
<th>yes norming yes utility n=27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hit rate</td>
<td>.823 (.13)(^s)</td>
<td>.842 (.10)</td>
<td>.853 (.10)</td>
<td>.839 (.13)</td>
</tr>
<tr>
<td>of unique</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of shared</td>
<td>.826 (.10)</td>
<td>.852 (.08)</td>
<td>.846 (.09)</td>
<td>.830 (.10)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>False Alarm Rate</th>
<th>no norming no utility n=27</th>
<th>no norming yes utility n=25</th>
<th>yes norming no utility n=27</th>
<th>yes norming yes utility n=27</th>
</tr>
</thead>
<tbody>
<tr>
<td>of unique(^a)</td>
<td>.161 (.11)</td>
<td>.158 (.14)</td>
<td>.168 (.14)</td>
<td>.198 (.15)</td>
</tr>
<tr>
<td>of shared(^a)</td>
<td>.107 (.07)</td>
<td>.108 (.07)</td>
<td>.128 (.10)</td>
<td>.117 (.07)</td>
</tr>
</tbody>
</table>

\(^a\) overall means for unique and shared information differ, [F(1,98)=25.25, p<.0001].

\(^s\) standard deviation appears in parentheses.

However, false alarm rates were significantly affected by a three way interaction of group size, utility, and information type, [F(1,98)=6.09, p<.05]. See Table 9 for means and Figure 9 for a graph of this interaction, which clearly shows the effect of the interaction on the unique information, but not on the shared information. Information type yielded a significant main effect on false alarm rates, [F(1,98)=25.25, p<.0001], with mean false alarm rates for unique information equal to .171, and for shared information, .115. Group members were more likely to make the error of marking as having appeared in their report a unique item they heard in conversation than a shared item which they had not seen.
The interaction of utility and group size significantly affected false alarm rates, \(F(1,98)=6.28, p<.05\). In dyads, utility confirmation produced a mean false alarm rate of .184, and lack of such confirmation produced a mean false alarm rate of .128. In triads, utility confirmation produced a mean false alarm rate of .118, and lack of such confirmation produced a mean false alarm rate of .151.

![Bar chart showing false alarm rates by utility, information type, and group size.](image)

Figure 9. Mean False Alarm Rates by Utility, Information Type, and Group Size.

**Unique or shared?** It was expected that group members would identify which of their information was unique during group conversation, especially in those groups which received the utility and norming manipulations. Did they? In other words, were they able to discern from discussion which of their information items were given to them alone? Another function of the recognition checklist was to address this question. Members were asked to decide if each item was in their report or not, and if it was, was it unique to their report, or shared among all reports? Two measures represent the data from their
responses. The total number of items that subjects correctly identified as unique or shared is termed "perfectly categorized hits." Conversely but not necessarily inversely related, a bias to categorize "old" items as unique (when they were actually shared) or to categorize old items as shared when they were really unique is reported here as "incorrectly categorized hits." Neither of these measures were significantly affected by the interaction of the manipulations: for perfectly categorized hits, \[F(1.98)=1.81, \text{n.s.}\], and for incorrectly categorized hits, \[F(1.98)=0.23, \text{n.s.}\]. Both of these measures were significantly affected by information type only: for perfectly categorized hits, \[F(1.98)=25.65, p<.0001\], and for incorrectly categorized hits, \[F(1.98)=45.18, p<.0001\]. As is evident from the means in Table 10, individuals were more likely to correctly categorize their shared items than their unique items, and conversely more likely to be mistaken on categorization of unique than shared information.

Memory sensitivity and response bias. A recognition memory task was used in this study in an effort to determine if memory played a role in why people were less likely to mention uniquely held information than shared information in conversation. The test of primary interest here was whether there was any difference in recognition for shared and uniquely held items. A measure of memory sensitivity seemed most appropriate to make this test. Of lesser interest, but deemed useful to provide additional information about the cognitive processes at work was a measure of response bias. These two measures can be calculated from hit and false alarm rates and have been recently recommended in the literature because they incorporate corrections for subjects' strategic errors in the recognition task, specifically guessing (memory sensitivity) and bias in the decision criterion (response bias) (Lord, 1985; Martell & Guzzo, 1991; Martell & Willis, 1991; Snodgrass & Corwin, 1988).
Table 10

Means of Perfectly and Incorrectly Categorized Hits, by Condition.

<table>
<thead>
<tr>
<th>Perfectly Categorized Hits</th>
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<th>yes norming</th>
<th>yes norming</th>
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<tbody>
<tr>
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<td>no utility</td>
<td>yes utility</td>
<td>no utility</td>
<td>yes utility</td>
</tr>
<tr>
<td>unique&lt;sup&gt;a&lt;/sup&gt;</td>
<td>n=27</td>
<td>n=25</td>
<td>n=27</td>
<td>n=27</td>
</tr>
<tr>
<td></td>
<td>.442 (.20)&lt;sup&gt;s&lt;/sup&gt;</td>
<td>.412 (.18)</td>
<td>.438 (.22)</td>
<td>.417 (.24)</td>
</tr>
<tr>
<td>shared&lt;sup&gt;a&lt;/sup&gt;</td>
<td>n=27</td>
<td>n=25</td>
<td>n=27</td>
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<tr>
<td></td>
<td>.555 (.16)</td>
<td>.599 (.18)</td>
<td>.636 (.18)</td>
<td>.560 (.18)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Incorrectly Categorized Hits&lt;sup&gt;*&lt;/sup&gt;</th>
<th>no norming</th>
<th>no norming</th>
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<td>yes utility</td>
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<tr>
<td>of unique&lt;sup&gt;b&lt;/sup&gt;</td>
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</tr>
<tr>
<td></td>
<td>.452 (.22)</td>
<td>.502 (.19)</td>
<td>.487 (.22)</td>
<td>.500 (.24)</td>
</tr>
<tr>
<td>of shared&lt;sup&gt;b&lt;/sup&gt;</td>
<td>n=27</td>
<td>n=25</td>
<td>n=27</td>
<td>n=27</td>
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<tr>
<td></td>
<td>.287 (.16)</td>
<td>.269 (.16)</td>
<td>.226 (.16)</td>
<td>.285 (.13)</td>
</tr>
</tbody>
</table>

<sup>a</sup> overall means for unique and shared information differ, [F(1,98)=25.65, p<.0001].

<sup>b</sup> overall means for unique and shared information differ, [F(1,98)=45.18, p<.0001].

<sup>s</sup> standard deviation appears in parentheses.

<sup>*</sup> perfectly and incorrectly categorized hits are corrected for availability and transformed into hit rates.

Further, Snodgrass and Corwin (1988) recommended the two specific measures chosen for use in this study, Pr (termed discrimination index or memory sensitivity) and Br (termed bias index or response bias) because of their theoretical independence. Pr is composed of the hit rate minus the false alarm rate, and ranges from -1 to +1, representing no memory (-1) to perfect memory (+1). Br is composed of the false alarm rate divided by (1 - Pr), and
ranges from 0 (conservative bias) to 1 (liberal bias) with a value of .5 indicating no bias present in the response. See Appendix C for an example calculation.

**Memory sensitivity.** Memory sensitivity was significantly affected by a three way interaction of group size, norming, and information type, $[F(1,98)=5.31, p<.05]$. See Figure 10 for a plot of the means of this interaction. All means show nearly perfect memory, but the interaction appears in the unique information, where norming increased sensitivity in dyad members and decreased it in triad members.

![Diagram showing memory sensitivity by information type and group size.]

Figure 10. Mean Memory Sensitivity, by Group Size, Norming, and Information Type.

Group size also yielded a significant main effect on memory sensitivity, $[F(1,98)=4.37, p<.05]$, with dyad members' mean memory sensitivity equal to .669, and that of triad members, .716. This effect was qualified by the interaction of utility and group size, $[F(1,98)=5.82, p<.05]$. In triads, those group members who received the utility manipulation showed increased memory sensitivity ($M=.74$) relative to those who did not receive the manipulation ($M=$
.69), but in dyads a relative decrease was seen. Dyad members who had received confirmation of information utility showed a mean memory sensitivity of .63, while those who had not received such confirmation showed memory sensitivity of .70.

Information type yielded a significant main effect on memory sensitivity, [F(1,98)=15.03, p<.001], with memory sensitivity for uniquely held items equal to .668, and for shared items, .723. Means for these variables are reported by condition in Table 11. It is evident that memory was closer to perfect for shared items.

Table 11

Mean Memory Sensitivity and Response Bias, by Condition

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<tr>
<th></th>
<th>no norming</th>
<th>no norming</th>
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<th>yes norming</th>
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<tbody>
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<td></td>
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<td>yes utility</td>
<td>no utility</td>
<td>yes utility</td>
</tr>
<tr>
<td></td>
<td>n=27</td>
<td>n=25</td>
<td>n=27</td>
<td>n=27</td>
</tr>
<tr>
<td>unique(^b)</td>
<td>.662 (.13)(^s)</td>
<td>.684 (.18)</td>
<td>.684 (.18)</td>
<td>.641 (.15)</td>
</tr>
<tr>
<td>shared(^b)</td>
<td>.719 (.11)</td>
<td>.744 (.11)</td>
<td>.718 (.14)</td>
<td>.713 (.14)</td>
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<table>
<thead>
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<td>yes utility</td>
<td>no utility</td>
<td>yes utility</td>
</tr>
<tr>
<td></td>
<td>n=27</td>
<td>n=25</td>
<td>n=27</td>
<td>n=27</td>
</tr>
<tr>
<td>unique(^c)</td>
<td>.491 (.25)</td>
<td>.465 (.22)</td>
<td>.519 (.20)</td>
<td>.536 (.30)</td>
</tr>
<tr>
<td>of shared(^c)</td>
<td>.395 (.23)</td>
<td>.424 (.20)</td>
<td>.445 (.20)</td>
<td>.420 (.19)</td>
</tr>
</tbody>
</table>

\(^b\) overall means for unique and shared information differ, [F(1,98)=15.03, p<.001].

\(^c\) overall means for unique and shared information differ, [F(1,98)=10.81, p<.01].

\(^s\) standard deviation appears in parentheses.
**Response bias.** The only significant effect in the model for response bias was information type, \( E(1,98)=10.81, p<.01 \), with response bias for uniquely held items equal to .503, and for shared items, .421. See Table 11 for the means listed by condition, remembering that a value of .5 indicates no bias. In the unique cells, the response bias is essentially nonexistent (about .5), while in shared cells it is evident that the response bias was more conservative. This finding is consistent with the analyses of perfectly and incorrectly categorized hits, as should be expected. On any given item from a group member's report, chances are it should be marked as a "shared" item because those appeared in the reports at a ratio of five to one, shared to unique items. If a person were in doubt how to mark the item (as shared or unique) on the recognition task, it would be conservative to always mark "shared". Group members were not aware of this five to one ratio, however, and may have resorted to random guessing when in doubt. Results of the response bias measure indicate that subjects were more likely to guess without bias on unique items and respond conservatively on shared items. Random guessing on unique items would produce more incorrectly marked shared items than correctly marked unique items. In addition, if random guessing occurred on shared items that would produce more correctly marked shared items than incorrectly marked unique items. Overall, the result of guessing would be more correctly marked shared items than unique, and more incorrectly marked unique items than shared.

Remember that the group members correctly categorized shared items more often than unique, and incorrectly categorized unique items (marking them shared) more frequently than shared (marking them unique) on their checklists. The response bias for shared items was clearly conservative, while
that for unique items was effectively no bias at all (possibly balancing risking unique and shared guesses when in doubt).

**Individual recognition checklists.** Individual subjects who did not participate in group discussions completed parallel checklists¹⁴ which were expected to yield an estimate of the individuals' memory-only component for items. Remember that this was not a traditional recognition memory task. This component was intended to be compared to the individual memory recognitions of group members (which may have been augmented by group memory from the discussion). It was expected that individual recognition memory would differ from that of group members only if something different occurred in the group process, and the expectation was that the group process would serve to increase memory for items, if anything. A planned contrast test of the total hit rate was used to test for differences between the group members and the comparison individuals. Comparing individuals who received no manipulation instructions with group members who received the norming instructions, there was no significant difference in total hit rates on the recognition task, \( [E(1,115)=0.25, \text{n.s.}] \). Nor was there a significant difference in the planned contrast between individuals and group members who received the utility confirmation, \( [E(1,115)=0.28, \text{n.s.}] \). These findings do not indicate any recognition difference attributable to the manipulations, but they also lend support to the elimination of memory differences as a reason why information was or was not mentioned in discussion.

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¹⁴ In an effort to equalize the encoding context, individuals read stimulus information in the company of others (confederates in the cases where no other subjects were available at the time) and were given the same instructions and expectations as subjects who were to be group members. Individuals experienced a somewhat shorter delay before the recognition task than did group members (5 minutes versus 10-30 minutes), and some individuals performed the recognition task individually while group members performed it in the presence of others.
Questionnaire

A questionnaire was administered to group members immediately after their discussion ended. The purpose of the questionnaire was to capture member perceptions of the group process\textsuperscript{15}. The entire questionnaire is found in Appendix A, but for easier reference to the items please see Figure 11.

Questionnaire responses. See Table 12 for mean responses to questionnaire items, by condition. A few significant differences are of interest among the means in this table. For item 2, whether it was acceptable to mention unique information in the group, there was a significant effect of utility, $[E(1,98)= 4.94, p< .05]$, with the means in the predicted direction. For item 3, confidence in the validity of the group's recommendation, there was a nearly significant effect of norming, $[E(1,98)= 3.76, p< .06]$, but the means were not in the predicted direction.

\textsuperscript{15} To characterize the structure of the questionnaire, responses of group members in 44 groups to questionnaire items which tapped perceptions of information and group process were factor analyzed. The most parsimonious and interpretable solution from a Harris-Kaiser rotation yielded three factors. These were named information, recommendation, and new ideas. The information factor was composed of questionnaire items 5 (percentage of report information considered useful), 6 (percentage of report information mentioned), and 1 (confidence in the utility of the report information). The recommendation factor was composed of questionnaire items 3 (confidence in the validity of the recommendation) and 4 (satisfaction with the recommendation). The new ideas factor was composed of questionnaire items 2 (acceptability of mentioning unique information), and 10 (agreement with the statement, "my group appreciated new and unique ideas.") Questionnaire item 11 did not load on any of these factors, due to the homogeneity of its responses.
1. How confident are you that the information in your report was useful? (Responses on a 9 point scale, anchored at endpoints and middle)

2. Was it acceptable to mention unique information in your group? (Responses on a 9 point scale, anchored at endpoints and middle)

3. How confident are you in the validity of your group's recommendation? (Responses on a 9 point scale, anchored at endpoints and middle)

4. How satisfied are you with the recommendation that your group made? (Responses on a 9 point scale, anchored at endpoints and middle)

5. How much of the information from your report was relevant and useful to your group's discussion? (Responses given as a percentage from 0 to 100%)

6. How much of the information from your report did you mention? (Responses given as a percentage from 0 to 100%)

7. Of all of the information discussed in your group, what proportion did each member contribute? (Responses given as percentages from 0 to 100%, with the stipulation that they must total 100)

8. Of your group's total time in discussion, what proportion was spent talking about new information? (Responses given as percentages from 0 to 100% for uniquely held and shared information and unsure, with the stipulation that they must total 100)

9. Of your group's total time in discussion, what proportion was spent talking about positively and negatively oriented information? (Responses given as percentages from 0 to 100% for positive and negative information and unsure, with the stipulation that they must total 100)

10. My group appreciated new and unique ideas. (Responses on a 9 point scale, anchored at endpoints and middle)

11. In my group, everybody listened to everybody else. (Responses on a 9 point scale, anchored at endpoints and middle)

12. If there was a leader in your group, which report did s/he read? (A, B or C)

13. Which report was read by the person who had the most influence over your group's decision? (A, B or C)

14. Of your group's total time in discussion, what proportion was spent talking by each group member? (Responses given as percentages from 0 to 100%, with the stipulation that they must total 100)

15. How much did each person in your group influence the final decision? (Responses were an independent rating for each individual on a scale of 1 to 5)

Figure 11. Questionnaire items.

For item 9 positive, proportion of discussion time spent talking about positive information, there was a significant effect of utility, [\( F(1,98) = 3.80, p < .06 \)], with more positive information discussed in the utility confirmed condition. For item 9
negative, proportion of discussion time spent talking about negative information, there was a significant effect of utility, \([E(1,98)= 4.61, p < .05]\), with less negative information discussed in the utility confirmed condition. The two way interaction of utility and norming nearly significantly affected perceptions that the group appreciated unique ideas, item 10, \([E(1,98)=3.47, p < .07]\).\(^{16}\)

**Group decision.** Conferral of utility was expected to boost confidence in the group decision. Confidence, as measured in questionnaire item 3, was expected to be significantly higher in those groups where utility was confirmed. See Table 12 for the means. No difference was observed due to the manipulation, \([E(1,98)= 0.35, n.s.]\). Satisfaction with the recommendation (item 4) was also expected to be higher in those groups. There was a significant three way interaction of utility, norming, and group size, \([E(1,98)=4.89, p < .05]\), but no difference was observed due to the utility manipulation alone, \([E(1,98)= 0.05, n.s.]\).

The social norming intervention was expected to increase information sharing and thus boost confidence in and satisfaction with the group decision. Confidence, as measured in item 3, was expected to be significantly higher in those groups where social norming has taken place. The effect of the manipulation was marginally significant, \([E(1,98)=3.76, p < .06]\), but in the wrong direction. Means were 8.0 for the control and 7.6 for the normed groups.

\(^{16}\) All three reports were used in triads, and the pairs of reports used in dyads were counterbalanced across conditions. Perceived differences were noted in the proportion of information contributed by group members who read reports B and C, but there appears to be no reason to place emphasis on these effects. For item 7B, proportion of information contributed by the group member who read report B, there was a nearly significant effect of norming, \([F(1,82)=3.85, p < .06]\), with amount contributed by that group member lower in those groups receiving norming instructions. Also for item 7C, proportion of information contributed by the group member who read report C, there was a significant effect of norming, \([F(1,82)= 3.96, p < .05]\), with the means in the opposite direction.
Table 12

Mean Responses to Questionnaire Items by Condition

<table>
<thead>
<tr>
<th>item</th>
<th>control</th>
<th>utility</th>
<th>norming</th>
<th>utility X norming</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6.0</td>
<td>6.6</td>
<td>6.1</td>
<td>5.8</td>
</tr>
<tr>
<td>2.</td>
<td>7.1</td>
<td>8.1</td>
<td>7.7</td>
<td>8.0</td>
</tr>
<tr>
<td>3.</td>
<td>8.0</td>
<td>8.0</td>
<td>7.4</td>
<td>7.7</td>
</tr>
<tr>
<td>4.</td>
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<td>8.0</td>
<td>7.9</td>
<td>8.2</td>
</tr>
<tr>
<td>5.</td>
<td>65.3</td>
<td>73.0</td>
<td>61.0</td>
<td>56.2</td>
</tr>
<tr>
<td>6.</td>
<td>64.4</td>
<td>65.0</td>
<td>58.9</td>
<td>56.2</td>
</tr>
<tr>
<td>7 A.</td>
<td>40.7</td>
<td>39.9</td>
<td>39.2</td>
<td>39.2</td>
</tr>
<tr>
<td>7 B.</td>
<td>40.1</td>
<td>38.6</td>
<td>34.0</td>
<td>39.5</td>
</tr>
<tr>
<td>7 C.</td>
<td>36.4</td>
<td>36.7</td>
<td>44.0</td>
<td>38.6</td>
</tr>
<tr>
<td>8 shared.</td>
<td>59.7</td>
<td>62.0</td>
<td>58.6</td>
<td>51.3</td>
</tr>
<tr>
<td>8 unique.</td>
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<td>24.6</td>
<td>26.5</td>
<td>30.4</td>
</tr>
<tr>
<td>8 unsure.</td>
<td>13.8</td>
<td>13.4</td>
<td>15.0</td>
<td>18.0</td>
</tr>
<tr>
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<td>71.7</td>
<td>61.6</td>
<td>69.8</td>
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<tr>
<td>9 negative.</td>
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<td>23.9</td>
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<tr>
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<td>7.2</td>
<td>6.5</td>
</tr>
<tr>
<td>10.</td>
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<td>7.4</td>
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<td>8.4</td>
<td>8.6</td>
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<tr>
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<td>39.8</td>
<td>40.0</td>
<td>39.5</td>
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<td>36.0</td>
<td>36.0</td>
<td>39.5</td>
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<tr>
<td>14 C.</td>
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<td>41.2</td>
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<tr>
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<td>3.9</td>
<td>3.9</td>
<td>3.6</td>
</tr>
<tr>
<td>15 B.</td>
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<td>3.85</td>
<td>3.6</td>
<td>3.7</td>
</tr>
<tr>
<td>15 C.</td>
<td>3.7</td>
<td>4.0</td>
<td>3.9</td>
<td>3.8</td>
</tr>
</tbody>
</table>

Note: Items 12 and 13 requested non-numeric responses.

Satisfaction with the recommendation (item 4) was also predicted to be affected by norming. No difference was observed due to the manipulation, \( E(1, 98) = 0.46, \text{ n.s.} \).
Confirmation of information utility generated a significant effect on the decision which the group reached, with utility confirmed groups reaching a decision to recommend a study abroad program more consistently than groups not receiving such confirmation, \(F(1,98)=6.68, p<.05\). This finding was not expected.

**Perceptions of time spent discussing unique information.** Confirmation of utility was expected to increase mentions of unique information. Therefore, individual responses to items 6 and 8 (for perception of time spent discussing unique information) were expected to be significantly higher in utility-confirmed groups. For item 6, the percent of information mentioned from the reports, there was no effect of utility, \(F(1,98)=0.02, \text{ n.s.}\). For item 8, the percent of time spent discussing unique information, there was no effect of utility, \(F(1,97)=0.08, \text{ n.s.}\).

The social norming intervention was also expected to increase mentions of unique information. Therefore, individual responses to items 6 and 8 (for unique information) were expected to be significantly higher in those groups where the social norm was manipulated. For item 6, the percent of information mentioned from the reports, there was no effect of norming, \(F(1,98)=2.59, \text{ n.s.}\). For item 8, the percent of time spent discussing unique information, there was no effect of norming, \(F(1,97)=0.32, \text{ n.s.}\).

**Qualifications by interactions with group size.** As might be expected, group size interacted with the manipulated variables to affect responses to a few questionnaire items. Significant three way interactions among utility, norming, and group size affected confidence in the utility of report information, \(F(1,98)=7.97, p<.01\), satisfaction with the group's decision, \(F(1,98)=4.89, p<.05\), and perceived utility of report information, \(F(1,98)=3.27, p<.08\). It would be logical to expect time proportion estimates to differ across group size, and
they did: percentage of time spent discussing shared information differed, \[E(1,98)=4.18, p<.05\], the percentage of time spent discussing unique information differed, \[E(1,97)=8.64, p<.01\], as did the percentage of time spent discussing positive information, \[E(1,98)=3.53, p<.07\]. Of these, a main effect of group size only affected confidence in information utility, and that was only marginally significant, \[E(1,98)=3.13, p<.08\] with a mean questionnaire response for dyad members of 5.74 and for triad members, 6.40.

However, it does not appear as though the size of the group made an appreciable difference in perceptions of group process, but a few findings are worthy of mention here. For dyad members only, on members’ perceived confidence in the utility of their report information, item 1, there was a significant interaction of utility and norming, \[E(1,42)=7.35, p<.01\]. That interaction also significantly affected the estimates of percentage of time spent talking about shared information, \[E(1,42)=4.97, p<.05\], and about unique information, \[E(1,42)=5.03, p<.05\]. Norming yielded a very nearly significant effect on whether it was acceptable to mention unique information in dyads, \[E(1,42)=3.79, p<.06\].

Among triad members, utility made a significant difference in the decision the group reached, \[E(1,56)=7.00, p<.05\], with those group receiving utility confirmation deciding to recommend a study abroad program more consistently than those groups not receiving such confirmation. Utility also made a significant difference in ratings of how well triads received unique information, \[E(1,56)=5.60, p<.05\], and a nearly significant difference in how much the group appreciated unique ideas, \[E(1,56)=3.22, p<.08\]. Estimated percentage of time spent discussing negative ideas was 30.7 in control triads and 20.5 in utility confirmed triads, a significant difference, \[E(1,56)=6.22, p<.05\].
Discussion

These data were gathered in an effort to find out what it is about unique information that keeps it from being mentioned in conversation as often as shared information. A model was given as a suggestion for how the process might work (refer to Figure 12). After first mention of an item, perhaps group

![Diagram](image)

Figure 12. Discussion Model

members cognitively check their perceptions of group acceptance for that kind of information and the utility of that item before they repeat it. We expected that this cognitive process was triggered by some subtle (or maybe outright) lack of support from the other group members for that piece of information, for example body language or an abrupt change of topic. We manipulated confirmation of information utility and the social norm for accepting unique information, deciding to check for influence at this stage of the model, and anticipating that
study of the triggering process should be saved for future research contingent upon finding variables effective at this stage. We measured repeat mentions of items, looking at second mentions, total responding mentions, and repeats of members' own and other's information. We thought that the whole process might be contingent upon differential memory for unique and shared items. For example, memory might well determine their first mention, so we checked recognition memory for differences between unique and shared information. In addition, we checked member perceptions of their information (including its perceived utility) and their group process to see how these perceptions fit in with the phenomenon. Also, the response bias, memory sensitivity, and perfect and incorrect categorization measures were calculated from recognition measures to determine whether group members were learning more about the nature of their information via their discussions.

In general, the results of this study indicate that although individuals in double control groups were less likely to mention uniquely held than commonly held information in group discussions, both the utility confirmation and social norming manipulations tended to reduce differential repeat mentions of uniquely and commonly held information, although usually not significantly and in most cases not in an additive fashion. Specifically, a number of significant effects of the manipulations were found which bear emphasizing here because they shed light on the mechanism of this phenomenon.

Because of the enormous number of findings from this research, an attempt has been made to organize this discussion to provide a concise treatment of how the findings fit the model outlined above. In general, we were interested in differential effects on the treatment of unique and shared information by group members. Commonly held information was relatively
impervious to our manipulations, but uniquely held information was affected in many cases (both findings as expected). Consequently this section can be most effective with a focus solely on the treatment of unique information by individuals.

Utility

Mentions. First, the effects of confirmation of information utility will be tracked throughout the model. First mentions of unique information were slightly, but not significantly increased by those hearing confirmation of item utility. But the main thrust of this study was to observe if the manipulations affected repeat mentions of unique information. Although not significant, second mentions of unique information were seemingly increased by those hearing utility confirmation, and total repeat mentions of unique information by utility confirmed members showed the highest mention rate of any information in the study. Confirmation of item utility seems to have made individuals more willing to repeat unique information after they were aware of its uniqueness via the first mention. Specifically, members hearing confirmation of item utility repeated their own unique information at a significantly higher rate than those members not hearing such confirmation, and although not significant, they also repeated unique information mentioned first by others at a much higher rate than those members not hearing such confirmation.

Perceptions of item utility. We were interested to see if group members' perceptions of item utility were affected by the utility manipulation. Remembering the manipulation check, perceptions of all of the checklist items were so affected. What about the unique items? They were perceived to be more useful by the group members hearing utility confirmation instructions than by the other members, and this difference was nearly significant. Also, and
significantly, commonly held information was thought to be more useful by members of utility confirmed groups.

**Recognition for unique items.** Looking at our post-discussion recognition measure, utility left hit rates for unique information virtually unchanged, and gave a small but not significant boost to false alarm rates. Recall that false alarm rates were determined for unique information by mentions of the unique information by others. Consequently, an increase in false alarm rates indicates that group members were hearing others' unique information and mistaking that it had been in their own report.

We checked further recognition measures for possible differences between those members hearing utility confirmation and those not, and found that the confirmation of utility decreased group member ability to correctly categorize information as unique, although not significantly. Similarly, the memory sensitivity index was slightly, and not significantly, lower for those members hearing utility confirmation, but response bias was virtually unchanged. Utility confirmation apparently did not serve to increase memory for unique items.

**Perceptions of group process.** From the questionnaire responses, we observed a significant positive effect of the utility manipulation on group members' perceptions about whether it was acceptable to mention unique information in their groups. A corresponding positive and nearly significant effect of confirmed utility was noted in the members' perceptions of the group's appreciation for unique ideas. These effects suggest that those groups receiving utility instructions were more open to unique ideas than those not receiving utility instructions.
**Hypothesis testing.** There also was a significant tendency for those groups which heard utility instructions to spend more time talking about positive information, and less time talking about negative information than groups not receiving those instructions. These groups were also consistently, and significantly, more likely to recommend the study abroad program than reject it. It is reasonable that groups which felt they had been given useful information would spend more time confirming each other’s information and supporting it with further positive information than groups which were not certain of the utility and validity of their information for the decision at hand. This parallels the findings from the hypothesis testing research where more questions are asked to confirm an hypothesis than questions asked to disarm it (e.g. Snyder & Swann, 1969). The fact that these groups always recommended the program also suggests that there was less disagreement in their conversations.

**Summary of effects of the utility manipulation.** Confirmation of information utility resulted in a number of positive changes among group members. Repeat mentions of unique information, including members' own and others' first mentioned items, were increased, as were perceptions of unique items' utility. Group members perceived more appreciation for unique information in their groups and a more accepting group environment for the presentation of unique ideas. The consistency of the decision to recommend a study abroad program was increased among groups which had received information utility confirmation, and positive information was perceived to be discussed more and negative information less than in other groups.

**Norming**

**Mentions.** Next, the effects of the social norming manipulation will be tracked throughout the model. First mentions of unique information were
slightly, but not significantly decreased by those hearing norming instructions. However, the main thrust of this study was to observe if the manipulations affected repeat mentions of unique information. Second mentions of unique information were increased somewhat by those in normed groups, but the rate of total repeat mentions of unique information by normed group members was no different from that of the members not receiving norming instructions. It is difficult to determine a clear pattern of the norming effects from these results. Also, and more consistently, normed group members repeated their own and others' unique information at a lower rate than non-normed members, although this tendency was not significant. The effect of norming on these variables was essentially to drop their rate to that of shared information, which was relatively unaffected by the norming intervention.

Perceptions of item utility. We were interested to see if group members' perceptions of unique items' utility were affected by the norming instructions which had emphasized the contribution of unique information to the group's discussion. In fact, these items were perceived to be less useful by the group members hearing norming instructions than by the other members, and this difference was significant.

Recognition of unique items. On our item recognition measure, norming gave a small but not significant boost to hit rates for unique information, and also raised, but not significantly, false alarm rates. The highest rate for false alarms was shown by those group members who heard both utility and norming instructions.

We checked further recognition measures for possible differences between those members in normed groups and those not, and found that norming did not particularly affect group member ability to correctly categorize
information as unique. However, the memory sensitivity index was slightly, and not significantly, lower for those members hearing norming instructions (the same drop observed with utility instructions). On the other hand, response bias was higher (slightly liberal) in the normed groups, but not significantly. Members of normed groups seemed slightly more willing to risk a guess that a unique item had been unique among reports. Overall, norming did not serve to increase memory for unique items.

**Group recommendation.** Confidence in the validity of the group’s recommendation decreased nearly significantly with the imposition of the norming instructions. Likewise, satisfaction with the recommendation was negatively affected by social norming, but not significantly so. Of all groups, those which heard only the norming instructions showed the lowest satisfaction with their recommendation.

**Summary of effects of the norming manipulation.** The norming manipulation resulted in a number of decreases among group members. There was no clear pattern of results from the mentions of unique information, except that repeats of members' own and others' unique information were decreased among those group members who had heard norming instructions. Unique information was perceived to be less useful by members of normed groups, and confidence with the validity of the group's recommendation as well as satisfaction with the recommendation were decreased.

**General Summary**

Results from first mentions of information in this study supported the information sampling model that Stasser and his colleagues have proposed (e.g. Stasser & Titus, 1985, 1987). Repeated mentions of information tell a somewhat different story, however. Uniquely held information was still less
likely to be rementioned in groups than shared information, but seemed more likely than shared information to be repeated when it had been mentioned twice. Group members seemed to be more positively affected by the utility manipulation in their decisions to repeat unique information than by the norming manipulation (which even seems to have somewhat discouraged repeat mentions of members' own and other's unique items). Further, group members were affected by very little when considering repeat mentions of shared information.

The two manipulations clearly acted in different ways with regard to how uniquely held information was treated. Utility confirmation served to increase perceptions of unique item utility, acceptability of mentioning unique information, and group appreciation for unique ideas. Utility increased perceived time spent discussing positive information, decreased perceived time spent on negative information, and created consistency in the groups' decisions to recommend the study abroad program. On the other hand, social norming as it was imposed in this study decreased perceptions of utility of unique information, confidence in the validity of the group's recommendation, and satisfaction with the recommendation.

A close look at the analyses suggests that these manipulations were not just counteracting each other. Perhaps the utility manipulation affected the perceptions of resources (as intended) as well as process in a positive manner and the social norming manipulation affected process in a negative manner. The model suggested earlier can retain utility in the proposed role, but be redrawn to reflect the indications that the process intervention (the social norming manipulation) did not act as expected in this study. Perhaps the social
norm of the group serves primarily as the environment in which the process occurs and sets outer bounds on the process. See Figure 13.

Figure 13. Revised Discussion Model

**Information Sharing in Group Decision Making, a General Model**

The small group literature on decision making appears remarkably void of general models for the communication of information by group members to reach a group decision. However, Guzzo (1982) has suggested an organization which could serve as a framework for such a model. He organized the study of group decision making around two major issues: the processing of information and the social-psychological dynamics of behavior. In such a scheme, he suggested that information processing consists broadly of activities such as the collection and evaluation of information, the creation of
alternative solutions, and the selection of the group recommendation. A perusal of the traditional literature would be more specific, referring to such activities as sharing of information to combine and enrich the group resources and error correction by other group members.

On the other hand, he suggested that the social-psychological dynamics consist of the group processes which can negatively affect the decision by imposition of limits on the collection and evaluation of information (e.g. Janis' Groupthink syndrome, 1972) or can positively affect the decision by encouraging the production of creative solutions (e.g. Osborne's Brainstorming technique, 1963). The traditional literature documents specific activities of social-psychological dynamics, such as the acquiring of influence by the most talkative member, or the withholding of information which is contrary to the group bias. These specific activities from the traditional literature are all enhanced when sharing of uniquely held information is increased in small groups making decisions.

**Difficulties of the Present Findings for the "General Model"**

Information processing; information sharing. Since Bales and Strodtbeck (1951), it has been agreed that group members share their information during the "orientation" stage in a group decision task (e.g. Caple, 1978; Shaw, 1981; Tuckman, 1965). "The orientation phase ensures that the information relevant to the decision is shared by all, particularly where different facts are likely to be more available to some members than to others" (Vinokur, Burnstein, Sechrest, & Wortman, 1985, p. 72).

The findings in this study suggest that member awareness of the utility of their information for the task at hand is an important caveat to this assumption. For more effective sharing of uniquely held information, the orientation phase
should probably be reinforced with confirmation of information utility if information is provided to the group or with a means of verifying information brought to the task by group members. In cases where expertise is recognized, this caveat may be met.

Information processing: error correction. One of the long-held virtues of group process is that of group member's correcting each others' mistakes (Shaw, 1932). This has been demonstrated recently to be especially the case with memory errors of omission moreso than those of commission (Hinsz, 1990; Alper, Buckout, Chern, Harwood, & Slimovits, 1976; Stephenson, Brandstaatter, & Wagner, 1983; Stephenson, Clark, & Wade, 1986).

When unique information is withheld, it appears less likely that error correction will occur in groups. Additionally, because memory errors of omission are most susceptible to correction, it is especially critical that members be willing to mention unmentioned (omitted) information. Consequently, it seems crucial that group members be assured of information utility.

Social-psychological dynamics: quantity of group member contributions. How are resources used by the group in reaching their recommendation? In this study, information use was quantified from the tape transcripts. From past research in small groups, one pessimistic conclusion about influence patterns in group process specifies that it is the quantity, rather than the quality, of contributions which determines a member's influence over the group product. For example, Riecken (1958) found that the most talkative group member held the most influence over the group's solution to a problem (also see Bass, 1949; Jaffee & Lucas, 1969; Gintner & Lindskold, 1975). In addition, the amount of time a member spends talking has been found to predict emerging leadership in forming groups (Bottger, 1984; Zander, 1979; also see attribution studies by

These findings suggest that the resources of the more verbal member(s) may be utilized during group problem solving rather than all resources of all group members. If these talkative individuals are focussing on commonly held information and not contributing new (uniquely held) information to the group task, quantity of vocalizations is not necessarily a good thing. Because of the difficulty in interpreting the results of our norming intervention, further research is indicated on a normative or informative process to encourage such activity.

Social-psychological dynamics: research on information suppression. The difference in our double control condition, where shared information was mentioned more often than uniquely held information at the group level, converges with the traditional literature in the form of support for a negative process, that of information suppression. Although we would hesitate to infer from these results that a mechanism as active as information suppression were occurring in the double control condition of our study, there are some parallel considerations.

There is a plethora of research which has found that sharing of information does not occur independently of attributes of the information. For example, information which does not support group attitudes is likely to be suppressed in favor of information more consistent with audience attitudes among non-coacting groups (Higgins & Rholes, 1978; Manis, Cornell, & Moore, 1974; Schramm & Danielson, 1958; Zimmerman & Bauer, 1956). Perhaps these suppressions have a common cause with those found by Stasser et al. (1989): perhaps uniquely held information is suppressed from discussion because of the group member's inability to determine its consistency with
shared group information. The findings from our utility manipulation could be
construed as support for this idea: generic confirmation of usefulness
encouraged contribution of information, and specifically increased contributions
of uniquely held information.

Correlates to this suppression phenomenon exist in the Groupthink
research on coacting groups (Janis, 1972, 1982) and group memory research
(e.g. mock-jury research where jurors often recall one line of reasoning more
easily than another and produce a verdict supported by biased evidence,
Davis, 1980). A related phenomenon in small group research is found in the
studies showing that the number of times an idea is supported in group
discussion is an influential factor in group acceptance of the idea (Hoffman,
1979; Stasser, Stella, Hanna, & Colella, 1984). These findings are consistent with

several formal models of group decision making (e.g. Hastie, Penrod, &
Pennington, 1983; Stasser & Davis, 1981) [which] propose that members of a
group align themselves in factions and that each faction defends its position
during discussion. It is frequently assumed that larger factions are more
influential, partly because of their ability to produce more arguments. (Stasser et
al. 1989, p. 67)

These findings, in conjunction with the findings from the present study, suggest
a question for further research. Perhaps inconsistent information is withheld in
group discussions in order to facilitate a more consistent collaborative solution.
One approach to answering this question would be to manipulate group
members' knowledge of what information is uniquely held within the group and
then observe whether suppression or sharing of it occurs. This idea will be
further explored.
Limitations of this Study

As in many studies, a limitation is noted due to the relatively small sample size. Forty-three groups may not have provided the power necessary to find significant effects of the manipulations as conducted. On the other hand, there was sufficient power at the individual level to observe effects if they existed. Of course, answering the questions at the individual level is different from answering the same questions at the group level, but much of the process is arguably an individual phenomenon, for example the decision to remention information.

A corollary limitation may be that the manipulations were generalizable and believable, but because of those features, may not have been strong enough to fully test the aspects of the process they purported to address. Evidence of the validity of this limitation exists in the weak results from the manipulation checks. Either the manipulation checks themselves were not directly appropriate to test the effectiveness of the manipulations, or the manipulations were not as effective as hoped. Support for use of the manipulations comes from the pilot testing results, where the manipulations were observed to make behavioral differences in how the groups approached their tasks (e.g. by members' reading page by page through their reports looking for unique information to share in the social norming conditions).

An interesting difference between the manipulations was observed in the utility perceptions of shared versus unique items. Those group members in the utility condition marked significantly more shared items useful than did other subjects, while those group members in the norming condition marked significantly fewer unique items useful than did other subjects. It may be that the norming was effective, but that the subjects in the normed groups were so
interested in sharing ideas that they downplayed the importance of the uniqueness factor. In turn this would have affected their willingness to perceive the items useful or to mention them in further conversation. Or, it is possible that group members interpreted "sharing of ideas" as conversing, which is easier when ideas are commonly held.

A further concern rests with the lack of a "correct" solution for our group task. Perhaps group members were hesitant to mention unique information because there was less motivation to find the right answer: any decision was fine. On the other hand, the taped conversations indicate that most subjects were indeed motivated to find a good recommendation, many mentioning that they hoped the university would have access to their conversations because they had worked hard in the discussion and hoped a study abroad program would in fact be implemented here at Rice. Some, in spite of instructions that this was an experimental situation only, even questioned whether the purpose was really to gather their opinions on the subject.

Future Research

There are multiple reasons why this line of research is important and should be continued. In general, the problem of loss of resources in groups is a global phenomenon which merits attempts to understand why it occurs. Not enough research has been conducted in this area in general, and none has addressed the specific question which this research has pinpointed. Concerns about item utility and social acceptability represent logical points where individuals in groups could choose to suppress uniquely held information. Although there are other such variables (none of which have been studied), these two manipulations were useful variables to test as representative of the process and resources approaches. Further research on information utility,
perhaps differentiating utility from validity, relevance and importance, promises to be most fruitful in pinpointing which aspect of utility was at work here and in elucidating the mechanism by which unique information is withheld. Also, research on status differentiation within groups may explain why our social norming manipulation did not produce expected results. It may be that the norms were changed, but that existing status differences (given that our groups, and Stasser's, were created of subjects randomly with no attempt made at equalization of status) obscured the effects of the norming intervention.

A focus on the nature of the information would also help to explain this phenomenon. If group members knew which of their information were unique, would they be more willing to share it? In many situations, group members know what information they alone can provide to the group. Logically, this knowledge should make members all the more interested in sharing their unique resources toward the optimal solution of the group task. Related results of a resource identification study support this prediction, in that there were virtually no process losses (measured as loss of resources) in groups which had discussed where their resources were located, but control groups without such discussion suffered numerous resource losses (Parker, 1986).

If group members knew which of their information were unique, and they also were given expert status by virtue of the unique information they held, then surely they would share it. Or not? If individuals were given a role in the group (that of the provider of financial information, for example), perhaps they would be more willing to discuss and defend their uniquely held information. Although these questions are interesting and may be important, care must be taken to differentiate the independent measures (such as status and role) in future research.
Conclusions

This study attempted more than a continuation of Stasser's research on one aspect of his relatively new information sharing model. That model is static, dependent upon probabilistic information sampling. This experiment was constructed to collect direct observations on repeated mentions of information as well as first mentions. It provided rich, contextual details about the conversation including, for example, whether group members were more likely to repeat their own unique information or that which others had first mentioned. This study also yielded a wealth of other data from which Stasser's articles did not benefit: data on group process, data on group members' perceptions of the information they were provided, as well as data from audiotape recordings of the group discussions: all of which may begin to give insight into why the phenomenon occurs as well as addressing the usual question of "how". It appears that both manipulations ameliorated the "Stasser effect."

Although the effect of the norming intervention was not easily interpretable for uniquely held information, it did serve to increase the repeat mentions of uniquely held information relative to shared information, when there were no utility instructions. The story seems stronger and more consistent regarding the effect of the utility manipulation. In general, confirmation of information utility demonstrated the expected results, increasing repeated mentions of uniquely held information relative to commonly held information, particularly when there were no competing norming instructions.

Apparently, concerns about information usefulness really do affect repeat mentions of unique items. The result of utility confirmation evidently is to get these ideas back into consideration for use toward the group decision. Whether the mechanism is simply to increase the "count" of times the item is mentioned,
thus increasing its influence (similar to Hoffman, 1979; Stasser et al., 1984); or just to satisfy concerns about information utility remains to be seen in future research. It would be interesting to determine if the relationship of number of item mentions and actual item influence is a parallel to the relationship noted earlier between the number of times a group member speaks and perceived influence of that member, and to study how these two relationships interact. Remember that in the present study, the utility manipulation not only increased repeat mentions of unique information but also created a consistency in groups' decision to recommend the study abroad program that was not in evidence among groups from other conditions. This finding has implications for future research efforts in this area as well as for applied work with decision making groups.
References


Laughlin, P.R. & Branch, L.G. (1972). Individual versus tetradic performance on a complementary task as a function of initial ability level. Organizational Behavior and Human Performance, 8, 201-216.


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Consent Form

EXPERIMENT #158

EXPERIMENTER: Susan L. Parker   Ph: 523-0348

CHAIR OF THE DEPARTMENT OF PSYCHOLOGY AT RICE:
David J. Schneider, Ph.D.   Ph: 285-5144

PLACE:
203B Sewall Hall, Rice University

BRIEF DESCRIPTION:
In this experiment, you will be asked to read information about study abroad. Then you will discuss the information in small groups and reach a group recommendation about whether such a program should be implemented at Rice. Your discussion will be audio-tape recorded.

RISKS:
There are no risks in this experiment. Your responses are guaranteed to remain confidential.

BENEFITS:
You have the opportunity to participate in original research in organizational psychology. You will have an opportunity to experience group process and be debriefed on theoretical aspects of group process.

CONSENT AGREEMENT:
I have read the above, and agree to participate in this study. I understand that I am free to discontinue my participation at any time. I further understand that any complaints or grievances I may have concerning my participation may be directed to the chairman of the Psychology Department Human Subjects Committee, or to the chairman of the Psychology Department at Rice University (527-8750 X 4862).

PRINT NAME:  

SIGNATURE:  

DATE:  

PSYC COURSE:  
Experimental Procedure

*Instructions to groups:
Sign consent forms, and collect.
Hand out reports.

*Welcome: Let's read these cover pages together, and then I'll give you about 5 minutes to read the reports for information."

*After the time for individual reading, announce that groups of three people each will be discussing the information. Extra individuals please wait in the anteroom for further instructions, while I get the group started on their discussion. Then explain to them and get individual checklist and debrief. Be sure to counterbalance forms A and B.

Place placards.

"I'll be tape recording your discussion, but the information from these tapes will be anonymous. No one else but you three folks and I will know who spoke on this tape."

Read the group instructions appropriate for this group:
instructions attached here:

Start tape.

Questionnaire.
Item checklist (forms A and B).
Debriefing sheets.
Subject credit slips.
Cover Page for Stimulus Reports

The purpose of this experiment is to look at group process. In order for you to do this, you'll be discussing a potential issue for Rice University: whether or not to recommend that Rice should adopt a Study Abroad Program, where a semester of study at a foreign university would be a feature of the Rice experience. Currently, students can study abroad if they set the whole thing up themselves, but we are talking about an actual program here, where more of the details are decided by the university. Students coming to Rice would expect to participate in this program, although it would not be mandatory.

This report is intended to provide you with information to use in your discussion. It contains information from the National Student Abroad Association, based on summaries from returning students. In general, people know different things when they discuss an issue in a group. So in the interests of realism, we have not provided identical information in each of the reports, although the information you receive will not be in direct conflict with information others in your group receive. Plan to consider the information from this report in making your recommendation.
Report A

What about location and language?
There are English speaking study abroad programs available in cosmopolitan areas of the world. Or you can find such programs in small, scenic towns. On one hand, programs in world capitals are often richly stimulating in terms of culture. Yet, programs in smaller towns tend to be better bargains than those in larger cities. And, programs in small towns provide more opportunity for casual interaction with the local citizens. But, programs in the more cosmopolitan areas tend to provide an impersonal experience in terms of personal interactions.

Some people think that study abroad is more valuable if it is completed in a language other than English, because of the opportunity to learn a new language. If the student chooses a non-English program, it is essential that he or she be realistic about his/her proficiency in the language of the abroad program chosen.

Is it worthwhile for undergraduates?
Most people feel that study abroad is a broadening experience that is well worth the time spent. Returning students affirm that no other undergraduate experience affected their lives so dramatically as did time spent learning and living in another culture. Study abroad is valuable because it reflects life as it will be lived in the twenty-first century, life on a one world scale. American organized semester abroad programs have been shown to provide rewarding and satisfying experiences. Also, a semester abroad can be a good time to take elective courses.

What are some specific benefits?
There are specific benefits of study abroad. Employers and graduate schools are usually impressed with the initiative and breadth students have displayed in studying abroad. For example, study abroad can open new perspectives on international political and economic issues. Knowledge of foreign countries from an economic standpoint can be a valuable career asset.
Extra opportunities for travel are also broadening. When a student is away in a study abroad program, it is less expensive to travel to surrounding countries for touring. A number of foreign universities offer programs that include excursions and field trips around their country. On the other hand, the unfamiliar environment proves disorienting for students studying abroad.

What are the student's responsibilities?
It is commonly felt that study abroad takes time away from progress toward your degree. The sponsoring university cannot guarantee that students studying abroad will benefit from the experience. Some things are ultimately the responsibility of the student. Case in point: it is difficult to transfer credit for some study abroad courses. Consequently, transfer credit should be arranged before study abroad is begun. Students must be aware that the amount of credit for a semester abroad in foreign universities varies from 6-16 credit hours from one program to another. Students should also be aware that some foreign programs have no accredited U.S. sponsor. It is the responsibility of each student to determine the most appropriate abroad program for him/herself.

There are many other complex issues to consider when thinking about study abroad, such as safety. The sponsoring university cannot take responsibility for the safety of students studying abroad. Personal health can also be of concern to students. In most cases, it is easy to stay healthy while abroad. Also fees: It is very important for each student to determine what fees are not covered by program package fees. For example, students must determine if international airfare is part of the program fee, because travel overseas is a significant cost.

Housing is difficult to find when studying abroad. In many countries, students can apply for visiting student status and enroll directly in a university, saving costs. Direct enrollment in a foreign university requires students to arrange their own housing and other services.

Finally, students must be willing to confront and try to learn from unexpected circumstances when studying abroad. But, American students need to remember that civil rights issues are simply not relevant in many foreign countries.
Report B

What about location and language?
There are English speaking study abroad programs available in cosmopolitan areas of the world. Or you can find such programs in small, scenic towns. On one hand, programs in world capitals are often richly stimulating in terms of culture. And, programs in small towns provide more opportunity for casual interaction with the local citizens. But, programs in the more cosmopolitan areas tend to provide an impersonal experience in terms of personal interactions.

There are English-language programs which integrate the study-abroad students with the native students in the same classes. Some people think that study abroad is more valuable if it is completed in a language other than English, because of the opportunity to learn a new language.

Is it worthwhile for undergraduates?
Over ninety percent of American students who study abroad are undergraduates. Most people feel that study abroad is a broadening experience that is well worth the time spent. Returning students affirm that no other undergraduate experience affected their lives so dramatically as did time spent learning and living in another culture. Study abroad is valuable because it reflects life as it will be lived in the twenty-first century, life on a one world scale.
American organized semester abroad programs have been shown to provide rewarding and satisfying experiences. Natural science majors have conducted interesting laboratory projects during their semesters abroad.

What are some specific benefits?
There are specific benefits of study abroad. For example, study abroad can open new perspectives on international political and economic issues. Knowledge of foreign countries from an economic standpoint can be a valuable career asset.
Extra opportunities for travel are also broadening. When a student is away in a study abroad program, it is less expensive to travel to surrounding countries for
touring. A number of foreign universities offer programs that include excursions and field trips around their country. On the other hand, the unfamiliar environment proves disorienting for students studying abroad. Students may suffer from loneliness when immersed in a different geographic location for an extended period of time.

What are the student's responsibilities?
The sponsoring university cannot guarantee that students studying abroad will benefit from the experience. Some things are ultimately the responsibility of the student. Case in point: it is difficult to transfer credit for some study abroad courses. Consequently, transfer credit should be arranged before study abroad is begun. Students must be aware that the amount of credit for a semester abroad in foreign universities varies from 6-16 credit hours from one program to another. Students should also be aware that some foreign programs have no accredited U.S. sponsor. It is the responsibility of each student to determine the most appropriate abroad program for him/herself.

There are many other complex issues to consider when thinking about study abroad, such as safety. The sponsoring university cannot take responsibility for the safety of students studying abroad. Personal health can also be of concern to students. In most cases, it is easy to stay healthy while abroad. However, some countries have bacterial, fungal, and parasitical diseases which may be difficult to cure. Also fees: It is very important for each student to determine what fees are not covered by program package fees. For example, students must determine if international airfare is part of the program fee, because travel overseas is a significant cost.

Housing is difficult to find when studying abroad. In many countries, students can apply for visiting student status and enroll directly in a university, saving costs. However, American students frequently live with families or in student hostels when studying abroad.

Finally, students must be willing to confront and try to learn from unexpected circumstances when studying abroad. American students need to remember that civil rights issues are simply not relevant in many foreign countries.
Report C

What about location and language?
There are English speaking study abroad programs available in cosmopolitan areas of the world. Or you can find such programs in small, scenic towns. On one hand, programs in world capitals are often richly stimulating in terms of culture. And, programs in small towns provide more opportunity for casual interaction with the local citizens. But, programs in the more cosmopolitan areas tend to provide an impersonal experience in terms of personal interactions.

There are many programs with classes taught strictly for English speaking students studying abroad (primarily Americans). Some people think that study abroad is more valuable if it is completed in a language other than English, because of the opportunity to learn a new language.

Is it worthwhile for undergraduates?
Most people feel that study abroad is a broadening experience that is well worth the time spent. Returning students affirm that no other undergraduate experience affected their lives so dramatically as did time spent learning and living in another culture. Study abroad is valuable because it reflects life as it will be lived in the twenty-first century, life on a one world scale. After time spent in study abroad, work back at college can take on more focus. American organized semester abroad programs have been shown to provide rewarding and satisfying experiences. However, foreign university classes are usually organized on a full-year basis, so study abroad is artificially limited if the student only spends one semester in those classes.

What are some specific benefits?
There are specific benefits of study abroad. For example, study abroad can open new perspectives on international political and economic issues. Knowledge of foreign countries from an economic standpoint can be a valuable career asset. Extra opportunities for travel are also broadening. When a student is away in a study abroad program, it is less expensive to travel to surrounding countries for
touring. A number of foreign universities offer programs that include excursions and field trips around their country. On the other hand, the unfamiliar enviroment proves disorienting for students studying abroad. But, one of the most important lessons to be learned from study abroad is flexibility.

What are the student's responsibilities?
The sponsoring university cannot guarantee that students studying abroad will benefit from the experience. Some things are ultimately the responsibility of the student. Case in point: it is difficult to transfer credit for some study abroad courses. Consequently, transfer credit should be arranged before study abroad is begun. Students must be aware that the amount of credit for a semester abroad in foreign universities varies from 6-16 credit hours from one program to another. Students should also be aware that some foreign programs have no accredited U.S. sponsor. It is the responsibility of each student to determine the most appropriate abroad program for him/herself.

There are many other complex issues to consider when thinking about study abroad, such as safety. The sponsoring university cannot take responsibility for the safety of students studying abroad. Personal health can also be of concern to students. In most cases, it is easy to stay healthy while abroad. Also fees: Program fees vary widely across the different programs. It is very important for each student to determine what fees are not covered by program package fees. For example, students must determine if international airfare is part of the program fee, because travel overseas is a significant cost.

Housing is difficult to find when studying abroad. In many countries, students can apply for visiting student status and enroll directly in a university, saving costs.

Finally, students must be willing to confront and try to learn from unexpected circumstances when studying abroad. It is important for students to acquaint themselves with the laws of the country in which they will study. American students need to remember that civil rights issues are simply not relevant in many foreign countries.
Instructions to Control Groups

Please discuss whether Rice should adopt a study abroad program where a semester of study at a foreign university would be a feature of the Rice experience.
1. Please share information
2. Please reach a recommendation: yes or no
3. If you decide yes, please discuss and make a group recommendation for details about how the program should work in the following aspects:
   
   location & language
   is it worthwhile
   benefits to students
   student responsibilities

4. If you decide no, please discuss and decide the major reasons why not, considering:
   
   location & language
   is it worthwhile
   benefits to students
   student responsibilities

The reports are being left with you so that you can refer to them if you wish. Please remember to share information, reach a recommendation, and then list how the program should be structured or why you don't recommend it. After you have reached agreement on all of these things, please tell the experimenter.

At this time, please introduce yourselves to the tape, giving your name, and the report you read. Remember that your conversation will remain confidential.
Social Norming Instructions

Please discuss whether Rice should adopt a study abroad program where a semester of study at a foreign university would be a feature of the Rice experience.
1. Please share information
2. Please reach a recommendation: yes or no
3. If you decide yes, please discuss and make a group recommendation for details about how the program should work in the following aspects:
   - location & language
   - is it worthwhile
   - benefits to students
   - student responsibilities
4. If you decide no, please discuss and decide the major reasons why not, considering:
   - location & language
   - is it worthwhile
   - benefits to students
   - student responsibilities

During your discussion, it is particularly valuable to the group for you to present any information you wish, especially the information you hold which was unique to your report. Remember that not all group members were given the same information, so don't hesitate to mention information even if you think no one else knows it. Every group member should be eager to hear and share new information. This will produce the best possible discussion in your group.
The reports are being left with you so that you can refer to them if you wish. Please remember to share information, reach a recommendation, and then list how the program should be structured or why you don't recommend it. After you have reached agreement on all of these things, please tell the experimenter.

At this time, please introduce yourselves to the tape, giving your name, and the report you read. Remember that your conversation will remain confidential.
Utility Instructions

Please discuss whether Rice should adopt a study abroad program where a semester of study at a foreign university would be a feature of the Rice experience.

1. Please share information
2. Please reach a recommendation: yes or no
3. If you decide yes, please discuss and make a group recommendation for details about how the program should work in the following aspects:
   - location & language
   - is it worthwhile
   - benefits to students
   - student responsibilities

4. If you decide no, please discuss and decide the major reasons why not, considering:
   - location & language
   - is it worthwhile
   - benefits to students
   - student responsibilities

Group discussion for decision making differs from individual decision making in numerous ways, one of which is that information which may not seem useful in an individual decision frequently becomes relevant and useful during group interaction. The reports that you have read were carefully constructed of information relevant for group discussion of this task, and pretesting with Rice students like yourselves has indicated the information to be very useful in reaching a recommendation about a study abroad program. Specifically, these Rice students have demonstrated the relevance, validity, and utility of the information in these reports for discussions about study abroad in general, and for decisions about the details involved in setting up such a program.
The reports are being left with you so that you can refer to them if you wish. Please remember to share information, reach a recommendation, and then list how the program should be structured or why you don't recommend it. After you have reached agreement on all of these things, please tell the experimenter.

At this time, please introduce yourselves to the tape, giving your name, and the report you read. Remember that your conversation will remain confidential.
Social Norming and Utility Instructions

Please discuss whether Rice should adopt a study abroad program where a semester of study at a foreign university would be a feature of the Rice experience.

1. Please share information
2. Please reach a recommendation: yes or no
3. If you decide yes, please discuss and make a group recommendation for details about how the program should work in the following aspects:
   - location & language
   - is it worthwhile
   - benefits to students
   - student responsibilities

4. If you decide no, please discuss and decide the major reasons why not, considering:
   - location & language
   - is it worthwhile
   - benefits to students
   - student responsibilities

Group discussion for decision making differs from individual decision making in numerous ways, one of which is that information which may not seem useful in an individual decision frequently becomes relevant and useful during group interaction. The reports that you have read were carefully constructed of information relevant for group discussion of this task, and pretesting with Rice students like yourselves has indicated the information to be very useful in reaching a recommendation about a study abroad program. Specifically, these Rice students have demonstrated the relevance, validity, and utility of the information in these reports for discussions about study abroad in general, and for decisions about the details involved in setting up such a program.
During your discussion, it is particularly valuable to the group for you to present any information you wish, especially the information you hold which was unique to your report. Remember that not all group members were given the same information, so don't hesitate to mention information even if you think no one else knows it. Every group member should be eager to hear and share new information. This will produce the best possible discussion in your group.

The reports are being left with you so that you can refer to them if you wish. Please remember to share information, reach a recommendation, and then list how the program should be structured or why you don't recommend it. After you have reached agreement on all of these things, please tell the experimenter.

At this time, please introduce yourselves to the tape, giving your name, and the report you read. Remember that your conversation will remain confidential.
Questionnaire

Which report did you read? Please circle one:  A  B  C  Group #_____

Your Group's Recommendation: please circle one: (yes) (no)

Please fill out this questionnaire by yourself, without further discussion in your group. Please respond to the statements by circling the appropriate number on the scale printed after each statement, or simply by filling in the blanks.

1. How confident are you that the information in your report was useful?
   1  2  3  4  5  6  7  8  9
   not at all confident  confident  totally confident

2. Was it acceptable to mention unique information in your group?
   1  2  3  4  5  6  7  8  9
   not at all acceptable  neither acceptable nor unacceptable  totally acceptable

3. How confident are you in the validity of your group's recommendation?
   1  2  3  4  5  6  7  8  9
   not at all confident  confident  totally confident

4. How satisfied are you with the recommendation that your group made?
   1  2  3  4  5  6  7  8  9
   not at all satisfied  satisfied  totally satisfied

5. How much of the information from your report was relevant and useful to your group's discussion? (Please give a percentage from 0 to 100%)

   __________

6. How much of the information from your report did you mention? (Please give a percentage from 0 to 100%)  __________

   please turn the page and continue..
7. Of all of the information discussed in your group, what proportion did each member contribute? Please assign points* for the relative amount of information contributed by each member. *Points must add up to 100.

**Report read** percentage of information contributed

member A

member B

member C

check that total= 100.

8. Of your group's total time in discussion, what proportion was spent talking about new information? Please assign points* for the relative amount of time spent talking about information everyone had read and unique information (information read by only one group member). *Points must add up to 100.

**Percentage of time spent talking about:**

information everyone read

unique information

not sure if unique info.

check that total= 100.

9. Of your group's total time in discussion, what proportion was spent talking about positively and negatively oriented information? Please assign points* for the relative amount of time spent talking about positive or negative information. *Points must add up to 100.

**Percentage of time spent talking about:**

positive information

negative information

not sure

check that total= 100.

please turn the page and continue..
For the following statements, please circle the extent of your agreement.

10. My group appreciated new and unique ideas.
   1 2 3 4 5 6 7 8 9
totally disagree neither agree nor disagree totally agree

11. In my group, everybody listened to everybody else.
   1 2 3 4 5 6 7 8 9
totally disagree neither agree nor disagree totally agree

12. If there was a leader in your group, which report did s/he read? (A, B or C) _______

13. Which report was read by the person who had the most influence over your group's decision? (A, B or C) _______

14. Of your group's total time in discussion, what proportion was spent talking by each group member? Please assign points* for the relative amount of time spent talking by each member. *Points must add up to 100.

   report read ______ percentage of time talking

   member A ____________________________
   member B ____________________________
   member C ____________________________

   check that total= 100.

15. How much did each person in your group influence the final decision? Please give a rating per person from the scale below. (There could be more than one of any rating, i.e. two 3 ratings.)

   1 2 3 4 5
   little influence moderate influence great influence

   report read ______ rating

   member A ____________________________
   member B ____________________________
   member C ____________________________

   Thank you!
Checklist for Group Members, Form B

Which report did you read? Please circle one:  A  B  C  Group #______

Please complete the following checklist by yourself, without further discussion. This is a very long list, but the information from it is very important. Please do your best to pay attention until the end of the task. Next to each item, please circle the appropriate response.

Mark whether the sentences listed below were in the report you read, using the following code:

n= no, it wasn't in the report I read
s= yes, it was in the report I read, and it was in everyone else's report also
u= yes, it was in the report I read, but it was not in anyone else's report

1. Transfer credit should be arranged before study abroad is begun.  n  s  u

2. Most students study abroad during their junior year of college.  n  s  u

3. There are English speaking study abroad programs available in cosmopolitan areas of the world.  n  s  u

4. It is important for students to acquaint themselves with the laws of the country in which they will study.  n  s  u

5. The unfamiliar environment proves disorienting for students studying abroad.  n  s  u

6. Some countries have bacterial, fungal, and parasitical diseases which may be difficult to cure.  n  s  u

7. American organized semester abroad programs have been shown to provide rewarding and satisfying experiences.  n  s  u

8. One advantage to studying in the United Kingdom is that courses are taught in English.  n  s  u

9. There are many other complex issues to consider when thinking about study abroad, such as safety.  n  s  u

10. Employers and graduate schools are usually impressed with the initiative and breadth students have displayed in studying abroad.  n  s  u

11. You can find such programs in small, scenic towns.  n  s  u

12. The vast majority of students choose the United Kingdom for study abroad.  n  s  u

13. Students must be aware that the amount of credit for a semester abroad in foreign universities varies from 6-16 credit hours from one program to another.  n  s  u
14. Study abroad can be rewarding because of the sharp contrasts of foreign cultures with American culture. n s u

15. The sponsoring university cannot guarantee that students studying abroad will benefit from the experience. n s u

16. Over ninety percent of American students who study abroad are undergraduates. n s u

17. Programs in world capitals are often richly stimulating in terms of culture. n s u

18. Study abroad can be a waste of time if the student is not comfortable with the language. n s u

19. In many countries, students can apply for visiting student status and enroll directly in a university, saving costs. n s u

20. There are many programs with classes taught strictly for English speaking students studying abroad (primarily Americans). n s u

21. In most cases, it is easy to stay healthy while abroad. n s u

22. A semester abroad can be a good time to take elective courses. n s u

23. Students should also be aware that some foreign programs have no accredited U.S. sponsor. n s u

24. Certain areas of the world are unsafe for Americans. n s u

25. Knowledge of foreign countries from an economic standpoint can be a valuable career asset. n s u

26. One of the most important lessons to be learned from study abroad is flexibility. n s u

27. Returning students affirm that no other undergraduate experience affected their lives so dramatically as did time spent learning and living in another culture. n s u

28. Natural science majors have conducted interesting laboratory projects during their semesters abroad. n s u

29. When a student is away in a study abroad program, it is less expensive to travel to surrounding countries for touring. n s u

30. Programs in smaller towns tend to be better bargains than those in larger cities. n s u
31. Programs in small towns provide more opportunity for casual interaction with the local citizens.  

32. A study abroad experience rarely has a major effect on students.  

33. It is difficult to transfer credit for some study abroad courses.  

34. If the student chooses a non-English program, it is essential that he or she be realistic about his/her proficiency in the language of the abroad program chosen.  

35. Study abroad is valuable because it reflects life as it will be lived in the twenty-first century, life on a one world scale.  

36. American students frequently live with families or in student hostels when studying abroad.  

37. Students must determine if international airfare is part of the program fee, because travel overseas is a significant cost.  

38. After time spent in study abroad, work back at college can take on more focus.  

39. The sponsoring university cannot take responsibility for the safety of students studying abroad.  

40. Many countries' living conditions are not as high as those in the U.S.  

41. It is very important for each student to determine what fees are not covered by program package fees.  

42. Direct enrollment in a foreign university requires students to arrange their own housing and other services.  

43. Most people feel that study abroad is a broadening experience that is well worth the time spent.  

44. Most students choosing to study abroad are Liberal Arts majors.  

45. It is the responsibility of each student to determine the most appropriate abroad program for him/herself.  

46. Students may suffer from loneliness when immersed in a different geographic location for an extended period of time.  

47. Study abroad can open new perspectives on international political and economic issues.  

48. Computer Science majors rarely study abroad.
49. American students need to remember that civil rights issues are simply not relevant in many foreign countries.

50. Foreign university classes are usually organized on a full-year basis, so study abroad is artificially limited if the student only spends one semester in those classes.

51. A number of foreign universities offer programs that include excursions and field trips around their country.

52. There are English-language programs which integrate the study-abroad students with the native students in the same classes.

53. Students must be willing to confront and try to learn from unexpected circumstances when studying abroad.

54. Certain courses can best be studied in the context of their native locations.

55. Programs in the more cosmopolitan areas tend to provide an impersonal experience in terms of personal interactions.

56. Program fees vary widely across the different programs.

57. Housing is difficult to find when studying abroad.

58. Almost one third of all students who go abroad to study go during the summer.

59. Some people think that study abroad is more valuable if it is completed in a language other than English, because of the opportunity to learn a new language.

60. It is commonly felt that study abroad takes time away from progress toward your degree.

Please turn the page and continue.....
Please remember that this information is very important. Please do your best to pay attention until the end of the task.
Mark whether the sentences listed below were useful arguments that you would have been willing to bring up in your group discussion, using the following code:
y = yes, this statement is a useful argument
n = no, this statement is not a useful argument

1. Programs in small towns provide more opportunity for casual interaction with the local citizens. y n
2. If the student chooses a non-English program, it is essential that he or she be realistic about his/her proficiency in the language of the abroad program chosen. y n
3. Study abroad is valuable because it reflects life as it will be lived in the twenty-first century, life on a one world scale. y n
4. Certain courses can best be studied in the context of their native locations. y n
5. Students must be willing to confront and try to learn from unexpected circumstances when studying abroad. y n
6. There are English-language programs which integrate the study-abroad students with the native students in the same classes. y n
7. A number of foreign universities offer programs that include excursions and field trips around their country. y n
8. Foreign university classes are usually organized on a full-year basis, so study abroad is artificially limited if the student only spends one semester in those classes. y n
9. It is the responsibility of each student to determine the most appropriate abroad program for him/herself. y n
10. Most students choosing to study abroad are Liberal Arts majors. y n
11. Students must determine if international airfare is part of the program fee, because travel overseas is a significant cost. y n
12. American students frequently live with families or in student hostels when studying abroad. y n
13. Programs in the more cosmopolitan areas tend to provide an impersonal experience in terms of personal interactions. y n
14. It is commonly felt that study abroad takes time away from progress toward your degree. y n
15. Some people think that study abroad is more valuable if it is completed in a language other than English, because of the opportunity to learn a new language. y n
16. A study abroad experience rarely has a major effect on students. y n
17. It is difficult to transfer credit for some study abroad courses. y n
18. After time spent in study abroad, work back at college can take on more focus. y n
19. The sponsoring university cannot take responsibility for the safety of students studying abroad. y n
20. Many countries' living conditions are not as high as those in the U.S. y n
21. It is very important for each student to determine what fees are not covered by program package fees. y n
22. Direct enrollment in a foreign university requires students to arrange their own housing and other services. y n
23. Most people feel that study abroad is a broadening experience that is well worth the time spent. y n
24. Students may suffer from loneliness when immersed in a different geographic location for an extended period of time. y n
25. Study abroad can open new perspectives on international political and economic issues. y n
26. Computer Science majors rarely study abroad. y n
27. American students need to remember that civil rights issues are simply not relevant in many foreign countries. y n
28. Program fees vary widely across the different programs. y n
29. Housing is difficult to find when studying abroad. y n
30. Almost one third of all students who go abroad to study go during the summer. y n
31. When a student is away in a study abroad program, it is less expensive to travel to surrounding countries for touring. y n
32. Natural science majors have conducted interesting laboratory projects during their semesters abroad. y n
33. Returning students affirm that no other undergraduate experience affected their lives so dramatically as did time spent learning and living in another culture. y n
y=yes, this statement is a useful argument
n=no, this statement is not a useful argument

34. One of the most important lessons to be learned from study abroad is flexibility.  y  n

35. Knowledge of foreign countries from an economic standpoint can be a valuable career asset.  y  n

36. Certain areas of the world are unsafe for Americans.  y  n

37. Students should also be aware that some foreign programs have no accredited U.S. sponsor.  y  n

38. A semester abroad can be a good time to take elective courses.  y  n

39. The sponsoring university cannot guarantee that students studying abroad will benefit from the experience.  y  n

40. Study abroad can be rewarding because of the sharp contrasts of foreign cultures with American culture.  y  n

41. American organized semester abroad programs have been shown to provide rewarding and satisfying experiences.  y  n

42. Some countries have bacterial, fungal, and parasitical diseases which may be difficult to cure.  y  n

43. There are English speaking study abroad programs available in cosmopolitan areas of the world.  y  n

44. Most students study abroad during their junior year of college.  y  n

45. Transfer credit should be arranged before study abroad is begun.  y  n

46. It is important for students to acquaint themselves with the laws of the country in which they will study.  y  n

47. The unfamiliar environment proves disorienting for students studying abroad.  y  n

48. One advantage to studying in the United Kingdom is that courses are taught in English.  y  n

49. There are many other complex issues to consider when thinking about study abroad, such as safety.  y  n

50. Employers and graduate schools are usually impressed with the initiative and breadth students have displayed in studying abroad.  y  n

51. You can find such programs in small, scenic towns.  y  n
y=yes, this statement is a useful argument
n=no, this statement is not a useful argument

52. The vast majority of students choose the United Kingdom for study abroad.  
y n
53. Students must be aware that the amount of credit for a semester abroad in foreign universities  
varies from 6-16 credit hours from one program to another.  
y n
54. Over ninety percent of American students who study abroad are undergraduates.  
y n
55. Programs in world capitals are often richly stimulating in terms of culture.  
y n
56. Study abroad can be a waste of time if the student is not comfortable with the language.  
y n
57. In many countries, students can apply for visiting student status and enroll directly in a university, saving costs.  
y n
58. There are many programs with classes taught strictly for English speaking students studying abroad (primarily Americans).  
y n
59. In most cases, it is easy to stay healthy while abroad.  
y n
60. Programs in smaller towns tend to be better bargains than those in larger cities.  
y n

Thank you!
Debrief

Should Rice University Offer a Semester of Study Abroad?

DEBRIEFING INFORMATION

You have participated in an experiment designed to study group process. The issue that your group discussed, whether to recommend a study abroad program for Rice University, is purely an experimental situation. No information or recommendations from your responses or those of your group will be seen by anyone other than the experimenter.

In general, group performance is considered to depend upon the resources available to the group and the efficiency of the group process. If all of the available resources are used and the group interacts in a productive fashion (cooperating rather than spending time on irrelevant disagreements, for example), the performance of the group is likely to be high. Sometimes in such a positive situation, the group can create a solution far better than any of the individuals could when working separately or even adding their individual products. That pleasant phenomenon is termed an "assembly bonus effect." This effect is very intriguing to some researchers. The exact requirements for the effect to occur are a bit elusive, but the evidence of the effect is solid. It is a little like searching for the Loch Ness monster, if you had actually seen a footprint!

One approach to finding out how groups can perform so well is to look at how they use their resources. In a decision making task, the information that group members hold is an important resource for the group. The focus of this study has been on how group members shared the information they were given. This is why the discussions were tape recorded: so that a transcript could be written from each discussion, and the content of the discussion be analysed. No one other than the experimenter will know whose voices are on the tapes.

Thank you for participating in this study. Your participation will move the search for optimum group process a step forward. Considering the fact that groups make recommendations to the President of the University, the Chief Executive Officer of Fortune 500 companies, the Director of Space Station Freedom at NASA, and George Bush, any help that we can give to improving group process is sorely needed and may make a difference.

If your participation in this experiment has interested you in spending a semester abroad, you can obtain information from the Office of Academic Advising in the Ley Student Center. Much of the information provided to you in this experiment originated at that office.
Appendix B

Table B-1  Mean Proportion of Available Information First
Mentioned in Groups by Condition and Group Size................132

Table B-2  Mean Proportion of Information Mentioned by Group
Members by Condition in Dyads........................................133

Table B-3  Mean Proportion of Information Mentioned by Group
Members by Condition in Triads........................................135
Table B-1

Mean Proportion of Available Information First Mentioned in Groups by
Condition and Group Size.

<table>
<thead>
<tr>
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<td>yes.. n=6</td>
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<td>.264 (.22)$^s$</td>
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<tr>
<td>no.. n=5</td>
<td>.311 (.12)$^s$</td>
<td>.348 (.18)</td>
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<td>yes.. n=5</td>
<td>.339 (.12)</td>
<td>.233 (.09)</td>
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<table>
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<td>.580 (.14)</td>
<td>.420 (.10)</td>
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$^a$ Overall means for unique and shared information differ, [$E(1,19)=17.47$, $p<.001$].

$^b$ Overall means for unique and shared information differ [$E(1,16)=90.08$, $p<.0001$].

$^s$ Standard deviations are reported in parentheses.
Table B-2

Mean Proportion of Information Mentioned by Group Members by Condition in Dyads.

| first mention of unique<sup>a</sup> | utility | norming |  |  |  |  |  
|-----------------------------|---------|---------|---|---|---|---|---|
| no.. n=12 | .263 (.23)<sup>s</sup> | .253 (.15) |  |  |  |  |  
| yes.. n=10 | .400 (.25) | .306 (.20) |  |  |  |  |  

| of shared<sup>a</sup> | utility | norming |  |  |  |  |  
|---------------------|---------|---------|---|---|---|---|---|
| no.. n=12 | .247 (.22) | .194 (.12) |  |  |  |  |  
| yes.. n=10 | .243 (.15) | .225 (.18) |  |  |  |  |  

| second mention of unique | utility | norming |  |  |  |  |  
|--------------------------|---------|---------|---|---|---|---|---|
| no.. n=12 | .201 (.26) | .511 (.30) |  |  |  |  |  
| yes.. n=10 | .425 (.50) | .379 (.20) |  |  |  |  |  

| of shared | utility | norming |  |  |  |  |  
|------------|---------|---------|---|---|---|---|---|
| no.. n=12 | .330 (.13) | .388 (.20) |  |  |  |  |  
| yes.. n=10 | .419 (.16) | .377 (.22) |  |  |  |  |  

| totals of unique | utility | norming |  |  |  |  |  
|------------------|---------|---------|---|---|---|---|---|
| no.. n=12 | .218 (.29) | .951 (.86) |  |  |  |  |  
| yes.. n=10 | 1.01 (1.4) | .457 (.30) |  |  |  |  |  

| of shared | utility | norming |  |  |  |  |  
|------------|---------|---------|---|---|---|---|---|
| no.. n=12 | .481 (.25) | .474 (.26) |  |  |  |  |  
| yes.. n=10 | .515 (.19) | .505 (.36) |  |  |  |  |  

<sup>a</sup> Conditions: no, yes.
Table B-2

Mean Proportion of Information Mentioned by Group Members by Condition in Dyads. Continued.

<table>
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<td>1.02 (1.5)</td>
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<td>.917 (1.1)</td>
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<td>.431 (.72)</td>
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<td>.687 (.55)</td>
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\(a\) overall means for information type differ, \([F(1,42)=7.87, p<.01]\).

\(s\) standard deviations are reported in parentheses.
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Table B-3
Mean Proportion of Information Mentioned by Group Members by Condition in Triads. Continued.

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<td>yes.. n=10</td>
<td>.532 (.29)</td>
<td>.378 (.22)</td>
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<sup>b</sup> overall means of information type differ, [F(1,56)=31.30, p<.0001].

<sup>c</sup> overall means for information type differ, [F(1,56)=6.10, p<.05].

<sup>s</sup> standard deviations are reported in parentheses.
Appendix C

Example calculation of memory sensitivity (Pr) and response bias measure (Br):

Pr is equal to the hit rate (HR) minus the false alarm rate (FAR). If an individual correctly assigns 8 out of 10 items as "old" items, that is a hit rate of .80. If the same individual mistakenly marks 3 out of 10 lures as "old" items, that is a false alarm rate of .30. Applying the recommended correction mentioned earlier in the text (Snodgrass & Corwin, 1988) results in a corrected HR of 8.5/11 or .77, and a corrected FAR of 3.5/11 or .32. Pr then, would equal .45.

Using Pr and the corrected FAR, we obtain Br with the following formula:

Br = FAR/(1-Pr). Therefore, Br equals .32/.55 or .58 for this example.