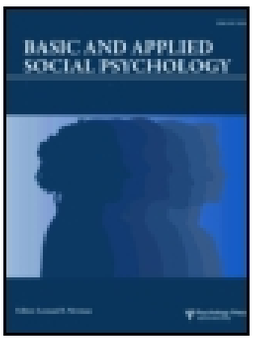

Basic and Applied Social Psychology

ISSN: 0197-3533 (Print) 1532-4834 (Online) Journal homepage: https://www.tandfonline.com/loi/hbas20

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To cite this article: Timothy A. Lavery , Timothy A. Lavery , Timothy M. Franz , Timothy A. Lavery , Timothy M. Franz , Jennifer R. Winquist & James R. Larson (1999) The Role of Information Exchange in Predicting Group Accuracy on a Multiple Judgment Task, Basic and Applied Social Psychology, 21:4, 281-289, DOI: 10.1207/S15324834BASP2104_2

To link to this article: https://doi.org/10.1207/S15324834BASP2104_2

BASIC AND APPLIED SOCIAL PSYCHOLOGY, *21*(4), 281–289

The Role of Information Exchange in Predicting Group Accuracy on a Multiple Judgment Task

Timothy A. Lavery
Department of Psychology
The University of Illinois at Chicago

Timothy A. Lavery, Timothy M. Franz
Department of Psychology
Indiana University South Bend

Timothy A. Lavery, Timothy M. Franz, Jennifer R. Winquist and James R. Larson, Jr.
Department of Psychology
The University of Illinois at Chicago

This study was conducted to examine whether the amount of unshared information (i.e., information that only one group member or another possesses prior to discussion) exchanged within groups is related to group-judgment accuracy when the correct response is not apparent to the members prior to discussion. Thirty-nine 3-person groups were asked to make a series of 36 judgments regarding the probability that hypothetical high school dropouts would return to school. These judgments were based on a set of information, part of which was given to all group members prior to discussion (shared information) and part of which was divided among them (unshared information). Moreover, this information was distributed to the members in such a way that their individual prediscussion preferences would tend to be either inaccurate (hidden profiles) or accurate (manifest profiles), relative to the optimal group judgment based on all of the information that was given to the group as a whole (i.e., both shared and unshared information). Results indicated that there was no relation between the amount of unshared information discussed and group accuracy on hidden-profile cases. Instead, the results suggested that group accuracy was determined by how accurate members were prior to discussion and that the vital role of group discussion was not to exchange information but to aggregate member judgments into a consensual group judgment.

Important decisions are often made in the collective. One perceived benefit of this collective approach is that group members can discuss their unique information (i.e., information of which the other members were unaware prior to discussion), thus enabling the group as a whole to make more educated (and, by implication, more accurate) decisions. This perceived benefit has been the crux of a substantial amount of research that has focused on the exchange of unique information during discussion and the impact that this exchange has on group accuracy (for a review, see Wittenbaum & Stasser, 1996).

Stasser and Titus (1985, 1987) were the first researchers to systematically examine the impact of prediscussion information distribution on group discussion. They did this via a laboratory paradigm in which information about three discrete choice alternatives (three candidates for student body president) was either distributed to all of the group members (shared information) or was divided among them (unshared information) prior to discussion. Groups were asked to discuss the candidates and decide which one was best for the job. A considerable amount of subsequent research using basically this same paradigm has indicated that groups tend to discuss more of their shared information than their unshared

Requests for reprints should be sent to Timothy A. Lavery, Department of Psychology (m/c 285), The University of Illinois at Chicago, 1007 West Harrison Street, Chicago, IL 60607–7137. E-mail: tal@uic.edu

information (Larson, Christenson, Abbott, & Franz, 1996; Larson, Christenson, Franz, & Abbott, 1998; Larson, Foster-Fishman, & Franz, in press; Larson, Foster-Fishman, & Keys, 1994; Schittekate & Van Hiel, 1996; Stasser, Taylor, & Hanna, 1989; Stewart & Stasser, 1995; Winquist & Larson, 1998).

This disproportion in the amount of shared and unshared information that groups discuss is of little consequence if the shared and unshared information leads the group to the same choice alternative. However, there may be instances where a suboptimal alternative is supported by the shared information. In these instances, groups must discuss their unshared information to be accurate. Realizing this, Stasser and colleagues (Stasser, 1988; Stasser & Stewart, 1992; Stasser & Titus, 1985) created *hidden profiles*. In a hidden profile, task-relevant information is distributed such that group members' individual prediscussion preferences will be inaccurate relative to the optimal choice based on the entire set of information (i.e., all of the information that is given to the group as a whole, shared or unshared). To illustrate, consider a simplified situation where a three-person group is asked to decide between two discrete choice alternatives, A and B. Consider further that there are two shared information items favoring Alternative A and three unshared information items favoring Alternative B. On the whole, there are more items favoring Alternative B than A. However, if the group only discusses its shared information, it will likely select Alternative A and, thereby, make a less than optimal decision (assuming that all of the information is equally diagnostic). Given this example, one can easily imagine another situation where the group's shared and unshared information favors the same choice alternative. We refer to these latter cases as *manifest profiles.* Results from the studies that have manipulated profile type indicate that groups select the optimal alternative far fewer times when the decision includes a hidden profile than when the decision includes a manifest profile (Christensen et al., 1997; Larson et al., 1998; Stasser & Stewart, 1992; Stasser & Titus, 1985).

Overall, the results of studies focusing on information exchange suggest that groups do not always fulfill their function as well as they could. They tend to discuss more of the information that all of the members already know prior to discussion, and they do not perform very well when it is essential for them to discuss their unshared information to make an accurate decision (i.e., when there is a hidden-profile situation). When groups do discuss their unshared information, they are able to make more accurate decisions on hidden-profile cases (Hollingshead, 1996; Winquist & Larson, 1998). These studies indicate that it is possible for information exchange to be used as a means to increase group accuracy.

However, two studies by Gigone and Hastie (1993, 1996) suggest an entirely different role for group discussion. Their results suggest a model that operates almost entirely at the individual member level. In both studies, Gigone and Hastie asked groups to make a series of 32 continuous scale judgments (deciding the grade that students received in an introductory psychology course). They used a policy-capturing methodology to examine the influence of particular information items on group judgments. They found evidence that, in general, the influence of information items was positively related to the number of group members who had prediscussion knowledge of the item, what they dubbed the *common knowledge effect.*

On the surface, the common knowledge effect is not inconsistent with the notion that information exchange is a vital part of discussion. However, Gigone and Hastie's (1993, 1996) results indicate that information exchange plays little or no role in producing this effect. Instead, the relation between prediscussion information distribution and the influence of particular information items on group judgments is mediated almost exclusively by prediscussion, individual preferences. By distributing a subset of the overall pool of information to each of the group members, the experimenter is essentially dictating what information each of the members uses to form an initial, individual preference. Shared information, because it is held by all of the group members, can be used by all of the members in reaching an initial preference, whereas unshared information can only be used by one member. Thus, prediscussion information distribution is important because it determines how many members are able to consider the information when forming their prediscussion preferences. The more members there are that consider a particular information item, the more influence that item is likely to have on the group judgment, simply because that item is able to affect more members' prediscussion preferences. Put another way, according to this view, most, if not all, of the final group product is determined prior to the group even coming together.

Given these results, one may speculate as to what function group discussion served in the Gigone and Hastie (1993, 1996) studies. In answer to this, Gigone and Hastie found that group judgments were strongly related to the average of the members' prediscussion preferences. This suggests that the vital function of discussion was simply to aggregate members' prediscussion preferences into a consensual group judgment. Of course, every group must ultimately combine member preferences to reach a final decision. Therefore, the main question at issue in this study is not whether groups aggregate their members' preferences at all. Instead, the main issue is whether, prior to aggregation, groups use information exchange as a means to revise erroneous member prediscussion preferences.

Despite Gigone and Hastie's results (1993, 1996), it is possible that information exchange may have an impact on group accuracy even for tasks similar to those used in their two studies. Gigone and Hastie did not explicitly manipulate profile type in their judgment tasks. Still, discussing unshared information should be important only when that information implies a different conclusion than the shared

information, and when the conclusion implied by the unshared information is, in fact, correct. It is unknown whether any of the 32 trials in Gigone and Hastie's task met these criteria. Thus, we used a task very similar to the one used by Gigone and Hastie, but we included hidden profiles in half of our judgments.

In addition to the inclusion of hidden-profile cases, our design differed from the two Gigone and Hastie (1993, 1996) studies in several other ways. First, we explicitly informed the participants in our study how heavily to weigh each of the information items to form an accurate judgment, whereas Gigone and Hastie left it up to their participants to decide how much importance to place in each of the items. Second, we manipulated prediscussion information distribution within groups, whereas Gigone and Hastie manipulated information distribution between groups. Third, we randomly distributed only a subset of the potential information items to the members, whereas groups collectively had all of the information in the Gigone and Hastie studies. The purpose of these last two changes was to create a situation where group members could not develop expectations over time for whether particular items were shared or unshared. We felt that such a situation would foster a more vital environment for information exchange.

We predicted that profile type would moderate the relation between information exchange and group accuracy. For manifest-profile cases, group accuracy should not be contingent on discussion of unshared information, and groups should be about as accurate as the members were coming into discussion. For hidden-profile cases, on the other hand, accuracy should depend on whether groups discuss and utilize their unshared information. Based on this, it was hypothesized that groups would be more accurate on hidden-profile cases when they discussed more unshared information.

METHOD

Participants

One hundred seventeen undergraduate students (63 women and 54 men) at the University of Illinois at Chicago who were enrolled in an introductory psychology class participated in the experiment for partial fulfillment of course requirements. The participants were split into 39 same-sex groups (21 women and 18 men). Group gender differences were examined in all the reported analyses.

Task and Materials

The participants were given information about 42 hypothetical female high school students who had dropped out of school because they were pregnant. For each of the dropouts, the participants were asked to judge the percentage of individuals like the one in question that would eventually return to school to complete their high school degree. The first 6 cases were used for practice. Thus, there were 36 experimental cases to be judged.

The information given to the participants for each case was selected from 12 potential information items about factors that could facilitate or inhibit a return to school (see Appendix).

Six of the factors were facilitators, and six were inhibitors. The six facilitators were Parent's Education Level, Extracurricular Activities Prior to Dropping Out, Grades Prior to Dropping Out, Friends' Educational Level, Career Motivation, and Amount of Government Assistance Available. The six inhibitors were Transportation Difficulties, Neighborhood Gang Activity, Attendance Record the Semester Prior to Dropping Out, Behavioral Problems at School Before Dropping Out, Satisfaction With School Prior to Dropping Out, and Use of Drugs and Alcohol. The 42 cases were constructed so as to appear as realistic as possible (i.e., using realistic combinations of facilitators and inhibitors).

For each case, the group as a whole received information about 9 of 12 possible factors. Information about the remaining 3 was said to be unknown. The information about the 9 factors was distributed among the three group members such that 3 of the items were given to all three group members (shared information) and 6 of the items were evenly distributed among the group members (unshared information). Hence, each member received a total of 5 items: 3 items of shared information and 2 items of unshared information. The 9 factors used for each case varied randomly across the 36 experimental cases. Similarly, the shared or unshared status of the factors varied randomly.

The participants were told exactly how much weight they should assign to each of the 12 factors to be accurate. The 12 factors were divided into three weight levels (Levels 1, 2, or 3). Each level contained four factors: two facilitators and two inhibitors. Level 1 was used as a base. Level 2 factors were said to be two times as important as Level 1 factors, and Level 3 factors were said to be three times as important as Level 1 factors. For example, Attendance Record the Semester Before Dropping Out was said to be an inhibitor that was two times as important as the inhibitor Transportation Difficulties, and Use of Drugs and Alcohol was said to be three times as important as Transportation Difficulties.

In addition to these between-factor levels, participants were also provided with within-factor levels. Conceptually, between-factor levels are analogous to predictor weights in a multiple regression model, and within-factor levels are analogous to the predictor values. Hence, the between-factor levels are referred to as factor weights, and the within-factor levels are referred to as factor levels. Whereas the factor weights enabled comparisons across factors for the same case, factor levels facilitated comparisons across cases for the same factor. For example, the inhibitor Use of

Drugs or Alcohol had three factor levels: occasional use, moderate use, and heavy use. The three factor levels were said to have the same relation among them as did the factor weights. That is, Level 2 was said to be two times as important as Level 1, and Level 3 was said to be three times as important as Level 1.

The factor weights and factor levels for the nine factors included in a given case were used to compute the exact percentage of dropouts with the same pattern of facilitators and inhibitors who would return to high school. This exact percentage was defined as the correct answer. The percentage was derived by starting with a base of 50% (i.e., without any information, there is an equal likelihood of the dropout returning to school or not returning to school). The extent of the increase or decrease from the base of 50% was determined using the factor weights and factor levels. For example, the information item Heavy Use of Drugs or Alcohol would decrease the likelihood of the dropout returning to school by 9% (factor weight = 3; factor level = 3; $3 \times 3 = 9\%$ decrease). Using this strategy, the correct percentage was derived as follows:

$$\text{Correct percentage} = \Sigma\,(FW \times FL) - \Sigma\,(IW \times IL) + 50$$

where FW and FL are facilitating factor weights and facilitating factor levels, respectively, and IW and IL are inhibiting factor weights and inhibiting factor levels, respectively. The values for the three factors that were omitted from each case were set to zero.

This equation was also used to derive the predicted member prediscussion preference for each of the cases (i.e., the percentage that the member should choose, given the information that he or she was provided). The only distinction between the predicted member prediscussion preferences and the correct percentage was that more values were set to zero for the predicted member prediscussion preferences (i.e., all but the five factors for which the member actually received information). Within each case, the predicted member prediscussion preferences were identical for all three members.

The 36 experimental cases were constructed so that 18 included manifest profiles and 18 included hidden profiles. Manifest and hidden profiles were distinguished by the absolute discrepancy between the correct percentage and the predicted member prediscussion preferences. For manifest-profile cases, there was no difference between the correct percentage and the predicted member prediscussion preference. In contrast, for hidden-profile cases, there was, on average, an absolute discrepancy of 20% (i.e., 20% more or less likely that the individual would return to school) between the correct percentage and the predicted member prediscussion preference. Half of the hidden cases were constructed so that the predicted member prediscussion preference was lower than the correct percentage, and half were constructed so that it was higher than the correct percentage.

Each case was presented to the participants on a standard printed form that listed all of the 12 factors and their factor levels. For each member, the 5 factors that pertained to the particular case being judged at the moment and their factor levels were circled on the sheet. The hidden- and manifest-profile cases were arranged in a random order. Twenty of the groups saw the cases in this random order, and 19 saw the cases in the reverse order. No differences were found in any of the analyses between groups who viewed the information in the two different orders.

Procedure

Participants were scheduled to participate in the study in multiples of three. The participants were told that they would be participating in a study on group decision making and that the other participants in the room with them would be their groupmates. The participants were told that the purpose of the study was to examine their ability to apply rules for making predictions about events when given incomplete information.

Next, the task was described to the participants. First, the participants were told that they would be receiving information about real female teenagers who had dropped out of high school because they were pregnant. The participants were told that this information was based on cases reported in several earlier studies supported by a large federal grant. The participants were told that their task was to estimate for each case the percentage of dropouts with identical characteristics who actually did return to school for their high school diploma.

The experimenter explained that there were a total of 12 factors that the earlier studies had found to either facilitate or inhibit the return to high school. Each of these factors was briefly described to the participants while they were looking at an example page. The participants were told that the earlier studies had found that some of the facilitators and inhibitors were more important than others in determining the likelihood of dropouts returning to school. The experimenter then proceeded to describe the weighting scheme to the participants (i.e., the factor weights and factor levels). The participants were told to assume that, if they knew nothing about the dropout, they should infer that there was a 50% probability of the dropout returning to school.

The participants were told exactly how many information items they would receive for each of the cases (five) as well as how many items the group as a whole would receive (nine). The participants were allowed to keep the 42 information sheets with them throughout the experiment. Thus, participants were not required to recall any of the information. For each of the cases, participants were given 30 sec to read the information and make an individual judgment. The participants were then given an additional 90 sec to discuss the case with their group mates and reach a consensus judgment.

These time limits were selected to be commensurate with the time taken by Gigone and Hastie's (1993) participants. For the first six cases, the experimenter provided the participants with the correct answer after the group reached its decision. Groups were given a 5-min break between their 18th and 19th experimental judgment. Groups' discussions were audiotaped. Four of the audiotapes contained a great deal of static, thus rendering them uncodable. Therefore, all analyses involving group discussion data included only 35 groups.

RESULTS

Reliability

A research assistant who was blind to the purpose of the study listened to the audiotapes of the 35 group discussions. The assistant was instructed to record each item of information the group discussed for each of the 36 cases. To estimate the reliability of the coding, a second coder, given the same instructions as the first, was asked to code 9 (26%) randomly selected discussions: five from the first order and 4 from the second order. We found adequate agreement between the two coders ($\kappa = 0.81$, $z = 162.00$, $p < .0001$), suggesting that our primary coder was able to reliably record the items that the groups discussed.

Preliminary Analyses

Prior to testing our main hypothesis that information exchange has an impact on group accuracy when the case includes a hidden profile, we needed to examine whether we were successful in manipulating profile type. Thus, we examined whether member prediscussion preferences were more accurate when the case involved a manifest profile than when it involved a hidden profile. Accuracy was measured as the absolute deviation of the member's prediscussion preferences from the correct percentage. Overall mean hidden and manifest accuracy scores were derived for each member by averaging the 18 absolute deviations for hidden and manifest cases, respectively. A 2 × 2 (Profile × Member Gender) mixed-design hierarchical analysis of variance (ANOVA) was conducted on the overall mean accuracy scores. Members were nested within groups to account for the possibility that member accuracy might not be independent within groups.

Results indicated that member preferences were more accurate when the case involved a manifest profile than when the case involved a hidden profile, $F(1, 37) = 530.73$, $p < .0001$, $\eta^2 = .93$ (manifest-profile cases: $M = 11.06$, $SD = 4.22$; hidden-profile cases: $M = 20.55$, $SD = 3.73$). Thus, it appeared as if we were successful in creating hidden profiles. The analysis also yielded a moderately significant Gender × Profile interaction, $F(1, 37) = 4.68$, $p < .04$, $\eta^2 = .11$. Male group members were slightly more accurate on manifest-profile judgments ($M = 10.46$, $SD = 4.00$) than were female members ($M = 11.57$, $SD = 4.36$), $F(1, 37) = 5.46$, $p < .02$, $\eta^2 = .03$. However, male group members and female group members were about equally accurate on hidden-profile judgments (men: $M = 20.23$, $SD = 4.01$; women: $M = 20.91$, $SD = 3.37$), $F(1, 37) = 2.04$, $p < .15$, $\eta^2 = .01$. The gender main effect did not even approach significance, $F(1, 37) = 0.05$, *ns*, $\eta^2 = .001$.

We also conducted a 2 × 2 (Profile × Group Gender) mixed-design ANOVA, using the overall mean absolute deviations of the group judgments from the correct percentage for hidden and manifest cases as the dependent variable (again, by averaging, for each group, the 18 absolute deviations for hidden and manifest cases, respectively). As with member preferences, groups were more accurate when the case involved a manifest profile than when it involved a hidden profile, $F(1, 37) = 163.90$, $p < .0001$, $\eta^2 = .82$ (manifest-profile cases: $M = 8.92$, $SD = 3.68$; hidden-profile cases: $M = 17.20$, $SD = 5.03$). This occurred, even though groups had the opportunity to discuss all of the available information in both profile types. No other effects even approached significance, all Fs ≤ 0.54, ps > .05, $\eta^2 \leq .01$.

The final analysis that we conducted prior to testing our main hypothesis examined a critical assumption of research on hidden profiles. Specifically, this research proposed that prediscussion information distribution is important because it determines how likely it is that particular information items will be discussed. The byproduct of this was a discussion bias favoring shared information over unshared information, which could impede group accuracy in the presence of a hidden profile. Thus, we examined whether groups were more likely to discuss shared information items than unshared information items. This was done in a 2 × 2 × 2 (Prediscussion Distribution: Shared vs. Unshared × Profile: Hidden vs. Manifest × Group Gender) mixed-design ANOVA. For each group, we derived the percentage of shared and unshared information discussed per case. Then, for each group, we derived the overall mean percentage of shared and unshared information discussed on hidden and manifest cases by averaging the percentage of unshared information discussed for the 18 hidden cases and the 18 manifest cases, respectively. These overall mean percentages were used as the dependent variable.

Results revealed a strong main effect for prediscussion information distribution, $F(1, 31) = 75.87$, $p < .0001$, $\eta^2 = .11$. On average, groups discussed a larger percentage of their shared information ($M = 86.9\%$, $SD = 18.9\%$) than their unshared information ($M = 73.1\%$, $SD = 20.3\%$). This occurred despite the fact that the group members had all of the information about each case recorded on the information sheet in front of them and so did not have to rely on their ability to recall that information. None of the other effects even approached significance, all Fs ≤ 0.63, ps > .05,

$\eta^2 \leq .02$. Thus, this study confirmed that there was a discussion bias in favor of shared information. The extent of the bias could potentially impact how accurate groups were on hidden-profile cases (if information exchange had an impact on group accuracy).

Testing the Impact of Information Exchange

Next, to test our main hypothesis, we derived two standardized regression coefficients for each group by regressing group accuracy onto the percentage of unshared information that the group discussed per case.[1] This was done separately for hidden and manifest cases. The standardized regression coefficients were then used as the dependent measure in a 2 × 2 (Profile × Group Gender) mixed-design ANOVA. According to our hypothesis, it was predicted that, on average, the standardized coefficients for manifest cases would not significantly deviate from zero (i.e., there would be no relation between group accuracy and the percentage of unshared information discussed for manifest-profile cases). On the other hand, it was predicted that, on average, there would be significant negative coefficients for hidden-profile cases (i.e., there would be a positive relation between group accuracy and discussion of unshared information; low numbers indicated greater accuracy).

Contrary to expectation, none of the effects in the ANOVA even approached significance, all Fs ≤ 1.25, ps $> .05$, $\eta^2 \leq .04$. Most important, the profile main effect was not significant, $F(1, 32) = 0.12$, *ns*, $\eta^2 = .04$. Thus, the relation between the amount of unshared information exchanged and group accuracy was not moderated by decision profile type (hidden-profile judgments: mean $\beta = -0.09$, $SD = 0.66$; manifest-profile judgments: mean $\beta = -0.02$, $SD = 0.47$). Moreover, the mean relation between amount of unshared information exchanged and group accuracy for hidden-profile judgments was not significantly different from zero, $t(34) = -0.81$, *ns*, $\eta^2 = .06$. Thus, our hypothesis was not supported. We found no evidence that information exchange impacted group accuracy.

Our failure to find a relation between the amount of unshared information exchanged and group accuracy, even on hidden-profile cases, is consistent with the notion that our groups used discussion primarily to aggregate their members' prediscussion preferences. Consistent with this, we regressed for each group the 36 group judgments onto the mean of the member prediscussion preferences and found that the average standardized regression coefficient was reliably different from zero (mean $\beta = 0.86$, $SD = 0.15$), $t(38) = 35.31$, $p < .0001$, $\eta^2 = .49$.

Supplementary Analyses

One possible explanation for our results is that the participants perceived the task as being extremely complex. If the participants had a great deal of difficulty applying the weighting scheme to their judgments, they may have given up trying to do so. In addition, if the participants gave up trying to use the weighting scheme, it is conceivable that discussion may have been primarily used to aggregate member judgments. That is, the groups were not concerned with evaluating the diagnosticity of individual information items, which is primarily done through information exchange.

Although we had no direct data indicating how complex the participants perceived the task to be (i.e., from the participants themselves), we were able to conduct two supplementary analyses to indirectly determine whether the task was overly complex and whether the participants gave up trying to use the weighting scheme. First, we examined whether the participants' prediscussion preferences were related to the predicted prediscussion preferences (i.e., the value that the participants should have chosen, given the information that they were provided). We regressed for each member the 36 prediscussion preferences onto the predicted prediscussion preferences for the 36 cases. We found that the average standardized regression coefficient was reliably different from zero (mean $\beta = 0.70$, $SD = 0.17$), $t(116) = 44.76$, $p < .0001$, $\eta^2 = .49$. Thus, contrary to what may have been expected if the task were too complex, members seemed to have been able to apply the weighting scheme to their judgments.

To examine whether the participants gave up trying to apply the weighting scheme to their judgments, we derived two standardized regression coefficients for each member by regressing prediscussion preferences onto the predicted prediscussion preferences separately for the first half of the experiment (i.e., the first 18 judgments) and the second half of the experiment (i.e., the final 18 judgments). We found no differences in the extent to which the participants were able to apply the weighting scheme in the first half of the experiment (mean $\beta = 0.70$, $SD = 0.17$) and the second half of the experiment (mean $\beta = 0.66$, $SD = 0.23$), $t(117) = 1.56$, $p < .11$, $\eta^2 = .01$. Thus, over the course of the experiment, the participants do not appear to have given up trying to apply the weighting scheme in favor of a more simplified (and potentially less accurate) approach.

DISCUSSION

Prior research examining information exchange in small groups has found that groups often do not exchange relevant

[1]We first attempted to regress group accuracy onto both the percentage of shared information and the percentage of unshared information that groups discussed per case. We felt that this would provide a truer estimate of the impact that discussing unshared information had on group accuracy. However, many groups discussed all of their shared information for each of the 36 cases (on average, groups discussed 86.9% of their shared information per case). As a result, for 13 groups it was not possible to derive an unbiased estimate for shared information discussed. Therefore, we decided to only regress group accuracy onto the percentage of unshared information discussed per case.

information in a manner that leads them to make the best decision. Specifically, information that only one member possesses prior to group discussion tends to be discussed less often. This study replicated these results with a multiple judgment task. Nevertheless, this study found no indication that information exchange actually had any impact on group accuracy, even for the hidden-profile cases. Instead, the groups seemed to focus more on aggregating their members' prediscussion preferences.

These results ran counter to our expectations. By including hidden profiles in the basic Gigone and Hastie (1993, 1996) design, we felt that information exchange would be important in predicting group accuracy. Our failure to find an effect for profile type means that the question still remains regarding why information exchange has been found to have an impact on group accuracy for studies using the Stasser paradigm (e.g., Stasser & Titus, 1985, 1987) but not for studies using the Gigone and Hastie paradigm. It is likely that the explanation for this apparent contradiction lies in task characteristics. There are clear differences in the nature of the tasks used in the two paradigms that can be pointed to as possible explanations for the contradictory results. Thus, it is instructive to compare the tasks used both in the Gigone and Hastie studies (1993, 1996) and this study, on the one hand, to the tasks used in studies that have found evidence for a relation between the amount of unshared information discussed and group accuracy, on the other hand. To date, there are two such studies. Hollingshead (1996) found that groups that chose the correct alternative in a hidden-profile task discussed more unshared information pertaining to the correct alternative than groups that chose the incorrect alternative. Similarly, Winquist and Larson (1998) found that the proportion of unshared information that groups discuss was a significant predictor of group accuracy.

One notable difference between these two studies and those that have not found that information exchange impacts group accuracy is the amount of time that groups were given to make a decision. Both Hollingshead (1996) and Winquist and Larson (1998) gave groups 20 min to make their decision. In contrast, groups in this study were given 90 sec to make each judgment. Gigone and Hastie (1993, 1996) gave groups no explicit time constraint, but in the 1993 study they reported that groups took 54 min on average to make all 32 judgments (about 1 min 40 sec per judgment).

More important for the role of information exchange is whether the time that groups were given was commensurate with the time that groups felt they needed to make their decisions. Time pressure is a factor that has been found to have an impact on the group decision-making process (Kelly, Jackson, & Hutson-Comeaux, 1997). Under high time-pressure conditions, groups sacrifice quality for the sake of task completion (Karau & Kelly, 1992). This means using less effortful, heuristic processes, such as simply aggregating members' prediscussion preferences. As time pressure decreases, groups are more likely to discuss and systematically process task-relevant information. For Hollingshead (1996) and Winquist and Larson (1998), most groups were able to make their decisions well before the time limit.[2] It is doubtful whether groups in these studies felt much time pressure as they worked to complete the task. On the other hand, we believe that groups in our study did feel pressure to make their judgments in time. In fact, several of the participants commented to the experimenter that they felt they needed more time to make their judgments. Perhaps time pressure provides a possible explanation for the conflicting role of information exchange in these studies.

This, however, does not explain Gigone and Hastie's (1993, 1996) results. Groups in their studies were not faced with an explicit time constraint. It is suggested that groups in Gigone and Hastie's studies also felt time pressure but a more implicit time pressure that occurred as a result of another notable difference between the two paradigms, namely, the number of decisions that groups were required to make. Both Hollingshead (1996) and Winquist and Larson (1998) asked groups to make one decision, whereas Gigone and Hastie (1993, 1996) asked groups to make 32 judgments. When groups have numerous decisions to make in the same discussion, they may focus less extensively on each individual decision. That is, the group may sacrifice thoroughness in the interest of completing the group task in a reasonable amount of time. Thus, the time spent on each decision may become a relevant consideration; groups may perceive more of a time constraint when they have numerous decisions to make. Indeed, this seems to be evident in Gigone and Hastie (1993), where groups were given no explicit time constraint yet took a relatively short amount of time to make each judgment.

There is also a third factor that may have made aggregation of prediscussion preferences even more likely in Gigone and Hastie (1993, 1996) and this study. All three studies used a response scale for which averaging (a form of aggregation) was a very reasonable strategy to use when there was disagreement. For example, in the Gigone and Hastie studies, it would have been very easy for a group that disagreed as to whether the student received an *A* or a *C* to split the difference and decide on a *B.* This strategy has the potentially desirable feature of resolving disagreement without rejecting any member's preference. On the other hand, although groups in the Hollingshead (1996) and Winquist and Larson (1998) studies also could have settled disagreement via aggregation (e.g., by basing their decision on a majority-wins straw poll), this strategy seems like it would be both less ob-

[2]Hollingshead (1996) reported the mean length of time that groups in several of her experimental conditions took to make their decision (although she did not report the grand mean). These mean lengths ranged from 13 min 30 sec to 17 min 30 sec. Winquist and Larson (1998) did not collect data on how long it took groups to make their decision. However, groups almost never took the entire 20 min to make their decision.

vious and less satisfying (i.e., it is less cooperative; it is excluding at least one member's preference) to groups.

Thus, we suggest that the number of decisions that groups were required to make, perceived time pressure (externally imposed or otherwise), and the nature of the response scale were all factors that led to the discrepant results found in studies using the Stasser paradigm (Stasser & Titus, 1985, 1987) and studies using the Gigone and Hastie (1993, 1996) paradigm. More generally, if it is the case that the discrepant results in these studies are explainable by task characteristics, it may be that the time has come to shift the focus away from examining if information exchange has an impact on group accuracy to examining when information exchange has an impact on group accuracy. The next logical step for this line of research may be to predict, based on various patterns of task characteristics, whether information exchange will have an impact on group accuracy.

ACKNOWLEDGMENTS

We thank Jeanne Yakin and Maria Varga for their assistance in the conduct of this research.

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APPENDIX: FACTORS THAT WERE USED IN THE EXPERIMENT AND THEIR STATED LEVELS OF IMPORTANCE

Facilitators

Level 1 Predictors

A. Parents' education level (objective measure).

1. At least one parent has a high school degree.
2. At least one parent has a 2-year college or technical degree.
3. At least one parent has a college or professional degree.

B. Number of extracurricular activities at school in year prior to dropping out (respondent self-report).

1. One to two extracurricular activities (average).
2. Three to five extracurricular activities (above average).
3. Six or more extracurricular activities (well above average).

Level 2 Predictors (Two Times as Important as Level 1 Predictors)

C. Grades before dropping out.

1. Grades average prior to dropping out.

2. Grades above average prior to dropping out.
3. Grades excellent prior to dropping out.

D. Friends' education (respondent self-report).

1. Less than 50% of friends have high school degree.
2. Fifty percent to 85% of friends have high school degree.
3. Eighty-five percent to 100% of friends have high school degree.

Level 3 Predictors (Three Times as Important as Level 1 Predictors)

E. Career motivation (career guidance test score).

1. Test score near 50th percentile (average).
2. Test score near 75th percentile (above average).
3. Test score well above 75th percentile (well above average).

F. State or local government assistance programs (objective measure).

1. State or local government programs available to pay part of direct education costs for returning students.
2. State or local government programs available to pay all direct education costs for returning students.
3. State or local government programs available to pay all direct education costs for returning students, plus child care supplements.

Inhibitors

Level 1 Predictors

G. Transportation (objective measure).

1. Moderate (long walk or moderated ride on public transportation).
2. Difficult (long commute but public transportation available).
3. Very difficult (long commute and public transportation poor or nonexistent).

H. Neighborhood gang activity (respondent self-report).

1. Gangs present; not personally involved.
2. Gangs present; peripheral involvement through friends.
3. Gangs present; direct personal involvement.

Level 2 Predictors (Two Times as Important as Level 1 Predictors)

I. Attendance record semester before dropping out (objective measure).

1. Mediocre attendance (4–7 days absent).
2. Poor attendance (8–14 days absent).
3. Extremely poor attendance (≥ 15 days absent).

J. Behavioral problems at school before dropping out (objective measure).

1. Minor behavioral problems but no formal disciplinary action.
2. Minor to moderate behavioral problems requiring formal disciplinary action but no suspensions.
3. Moderate to severe behavioral problems requiring formal disciplinary action, plus one or more suspensions.

Level 3 Predictors (Three Times as Important as Level 1 Predictors)

K. Satisfaction with school prior to dropping out (school satisfaction questionnaire score).

1. Satisfaction near 40th percentile (below average).
2. Satisfaction near 20th percentile (well below average).
3. Satisfaction below 10th percentile (extremely below average).

L. Use of drugs or alcohol (respondent self-report).

1. Occasional use of drugs or alcohol, always at social events.
2. Moderate use of drugs or alcohol, sometimes during school.
3. Heavy use of drugs or alcohol, in many settings.