

Group Dynamics: Exploring Whether Two Heads are Better than One

Dawn Meissner and Amber Bentilla

Faculty Sponsor: Betsy L. Morgan, Department of Psychology

ABSTRACT

This study examined the effects of evaluation and reward on group productivity. Thirty-seven female and 23 male undergraduates served as participants who were randomly assigned to one of four conditions created by varying the absence/presence of reward and the absence/presence of an evaluator. The dependent variable was the group score on a timed trivia task. Participants' satisfaction with the group experience was measured before and after the results of the task were known. In contrast to our hypotheses, the results showed a main effect of reward and evaluator presence; whereby, groups with no evaluator and no reward present produced higher trivia scores and were therefore more productive. The satisfaction findings suggest that "losers" are more likely to criticize themselves and involved others when the group is unsuccessful; whereas "winners" are less likely to criticize their winning group. Findings suggest a complex relationship between motivation and the effects of outside factors such as reward and evaluator. Further research should attempt to identify both optimal and detrimental environments for group performance tasks.

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In recent years, businesses around the world have acknowledged the importance of teamwork on their companies' successes (e.g., Perkins, 1997). A common belief appears to prevail: teamwork achieves more than individual work. However, despite this new attention on corporate group work, groups are not always as effective as they might be. Consequently, the proposed study examines the impact of evaluation and motivation on individual and group performance in order to add to a growing body of literature regarding ways to improve the effectiveness of groups.

Why work in groups?

Group work is a common characteristic in American culture: the jury system, group therapy, family networks, and the business world all rely on groups. The question becomes- how is a collection of judgements beneficial over one jury member's decision? Why and how is a group of individuals more effective than the expertise of one individual's efforts? While individual work can be successful, executives of corporations like General Motors, AT&T, and Texas Instruments embrace the team approach's results: increased employee productivity, reduced inventory costs, lower employee turnover, customer service improvement, and decreased error rates (Burton, 1990; Weillins, 1994). Group work has also been observed to

change overall behavior of workers in business settings by increasing their positive attitudes toward their jobs, their willingness to suggest solutions to problems encountered in their work groups, and decreasing the number of sick days taken (Young, 1993).

Group work enhances the quality and quantity of both output and creativity. For instance, Michaelsen and colleagues (1989) reported a group's total scores on multiple-choice course examinations were, on average, higher than individual's total scores. In studies on creativity, groups consisting of multiple members of differing attitudes and diverse background are found to be more creative due to the compilation of wide spectrums of thoughts (as reviewed by Aranda, 1998). In turn, each member can synthesize their own thoughts with those of the others, and eventually join together with a single high quality decision or product. Indeed, as the advantages of group work continue to become more apparent, so does the number of corporations who incorporate group work into their strategies. Estimates suggest the U.S. workforce will be increasingly organized into work teams (Albrecht, 1997). Perkins (1997) concluded from organizational group research, "The key to sustainable success for organizations is to perform collectively, so that the enterprise is greater than the sum of its parts." (p. 50).

What needs to be considered?

Businesses need to know how to keep groups working productively and positively, optimizing their overall performance. Companies also need to be aware of the problems associated with group processes. Finally, businesses need to attend to multiple aspects including accountability and motivation.

Accountability is a large factor when dealing with an individual's contribution to a group; however, it is not an easy concept to understand within modern American culture. The U.S. emphasizes individualistic achievement and motivation while the business world attempts to positively target the dimensions of teams (Aranda, 1998). It is easy to envision the difficulties and uneasiness involved in business/corporate intentions. Accountability breeds responsible attitudes. When all members possess a substantial amount of responsibility for overall team performance, both individual and team output appears to increase substantially (Sheppard & Taylor, 1999).

The other important aspect of group performance is motivational level. The more that each individual in a group is motivated to perform a task, the greater the group performance (Burton, 1990). Many workplaces now incorporate group-based reward plans that measure the group's performance, but all reward individuals on the basis of how well the group performs (Heneman & Von Hippel, 1995). This approach has generally been seen as beneficial to the group's output since the plan encourages the group members to cooperate and form goals to accomplish their task.

Accountability and motivation are both related to group work outcomes. Without careful attention to these characteristics or a failure to acknowledge their significance, social loafing can occur. This "social disease" occurs when a group member decreases their individual efforts, relying more on the other members to achieve their group goal (Heneman & Von Hippel, 1995). In an important study by Sheppard & Taylor (1999), motivation was experimentally manipulated in order to reduce social loafing. Participants were arranged in groups and instructed to, by collaborative efforts, accumulate as many uses for an object as possible. The experimenters manipulated the presence of reward, positive vs. negative feedback, and presence of evaluator during performance of group tasks. All manipulations were believed to directly affect effort motivation during these tasks. Results revealed that participants would

work hard for a valued outcome if they believe their individual efforts matter. A good example of this is students who work harder because they believe that the quality of their papers will be directly related to the grades received. Conclusions from Sheppard and Taylor's research indicate that social loafing can be eliminated if participants in groups value productive behaviors and outcomes, believe that performance is dependent on effort, and believe that the outcome is dependent on performance.

The current research explored the role of two important and related factors on group and individual performance: accountability and motivation. We predicted that to decrease social loafing, each member needs to feel a certain degree of responsibility to the group and believe strongly that overall performance of the team is dependent upon the sum of each individual's efforts. We hypothesized that:

1. Group performance will be greater when accountability is present (e.g., an evaluator) than when it is not.
2. Group performance will be greater when motivation (e.g., reward) is present than when it is not.
3. Individual performance will be greater when accountability is present than when it is not.
4. Individual performance will be greater when motivation is present than when it is not.

Methods

Participants and Procedure:

37 female and 23 males solicited from undergraduate psychology, communications, and health education courses received course credit for their participation in this study. Participants were run in groups of five.

The participants were randomly assigned to one of four conditions. Each condition varied absence/presence of a reward and absence/presence of an evaluator, leading to four potential conditions. In the reward conditions, the experimenter informed participants that there would be a reward (each member of the team with the most points received \$5 to be used toward university purchases). In the no reward conditions, the experimenter mentioned no reward, participants were simply be told to complete the task to the best of their ability. In the evaluator present conditions, the evaluator walked around with a clipboard and appeared to take notes. The participants in these evaluator present conditions were notified beforehand that the evaluator would be observing both their individual efforts as well as the group's effort. Consequently, the four conditions were as follows:

1. Reward with evaluator present.
2. No reward with evaluator present.
3. Reward with evaluator not present.
4. No reward and no evaluator present.

The task for all groups involved collaborative effort within each group on identical sets of trivia questions. The four conditions were run at separate times. Placed at each table were five resource books for the groups to utilize during the task. Each group was allowed 10 minutes to obtain as many answers to the trivia as they can. In order to prevent quick guessing on the answers, the groups were informed that a wrong answer would result in a deduction of

points from their total score. All groups within each condition were instructed to perform a task and were told they would be videotaped during the testing period. This deceptive declaration was made so that participants were motivated to more accurately recall their contributions at the end of the task. In fact, no videotaping took place. After 10 minutes, each group was asked to close all resource books and hand in their answers to the trivia questions.

Immediately following the collection of answers, each participant was handed a survey and asked about their perceptions of their own personal contribution as well as their satisfaction with the overall group experience. While the participants were completing the survey, the trivia questions were corrected for each group. A correct answer received 5 points, no answer received 0 points, and a wrong answer received -5 points. The total points for each group was then tallied to determine the "winner" (who received a reward in two of the conditions). After the winners are announced, another survey was handed out that contained several of the same questions on the first survey in order to gauge the effects of the actual group success on the participants' perceptions. Finally, the participants were debriefed and all participants were given a candy bar for their participation.

Results

Table 1 shows the mean trivia scores and standard deviations for each of the four conditions. The analyses involved a 2 x 2 factorial design involving two independent variables with two levels each, presence of reward (present or not), presence of evaluator (present or not). The dependent variable was group productivity as measured by the groups' scores on the trivia test. The trivia scores were compared across each condition using ANOVA with an alpha level of .05 on the statistical software SPSS.

Contrary to the hypotheses that there would be a main effect for reward presence and for evaluator presence (and a significant interaction) such that the trivia scores would be higher when there was a reward and/or evaluator, the results were generally in the opposite direction. While there was no interaction effect detected, there was a main effect detected for reward presence, and there was a main effect in regards to evaluator presence, ($F(1,59) = 8.14, p < .01$), whereby, groups with no evaluator present and those in the no reward condition produced higher trivia scores and were therefore more productive.

In order to more fully explore these findings, we conducted a post-hoc analysis of the data by assessing the number of errors each group make on the task (e.g., the number of points deducted for wrong answers). Table 2 shows their mean error and standard deviations for each of the conditions. There was no evidence of a main effect for reward or the presence of an evaluator. However, the evaluator presence showed a pattern inconsistent with the primary analysis (e.g. groups with an evaluator present showed a trend toward making fewer errors, despite their overall lesser performance on the trivia test ($F(1,59) = 1.867, p = .18$). Of particular interest, was a significant interaction effect ($F(1,59) = 7.467, p < .01$), the highest error rates were shown in the condition where there was no reward and no evaluator and the lowest shown with both a reward and an evaluator.

Satisfaction measures

In order to explore our hypotheses regarding the participant's satisfaction with experiences, their responses to survey questions (asked before and after the winners results announcement) were analyzed. In general, the results supported our hypothesis that to decrease social loafing, each member needs to feel a certain degree of responsibility to the group and believe strongly that overall performance of the team is dependent upon the sum of each individual's efforts. We conducted these analyses on participant perceptions separate-

ly for the participants involved in the winning groups ($N=20$) and those involved in the losing groups ($N=60$). When assessing the perceptions of the losing group members we found that their rating of the overall effectiveness of their groups dropped between time 1 ($M = 4.35$, $SD = 0.77$) and time 2 ($M = 4.03$, $SD = 0.89$, paired $t = 2.7$, $p < .01$) – where a higher score indicates a higher level of effectiveness perceived. In other words, the losing participants appear to rate their overall effectiveness higher before they know the results, and lower after they realize they did not win. Analyses on the winners show a predictable opposite pattern, they rate their overall effectiveness significantly lower before they know they are the winning group ($M = 4.33$, $SD = 0.77$) and higher after they are told they are the highest scorers ($M = 4.68$, $SD = 0.47$, paired $t = -2.67$, $p < .05$).

In the survey question regarding participants' personal satisfaction with the trivia task, a similar pattern is found. The losing groups rate group performance satisfaction higher before the announcement of winners/losers ($M = 4.20$, $SD = 0.82$) and lower after they know they have lost, $M = 3.80$, $SD = 0.87$, paired $t = 3.40$, $p < .01$. The winning groups rate satisfaction lower before they know their performance in comparison with other groups ($M = 4.43$, $SD = 0.78$), and higher after they are informed that they are the highest scorers, $M = 4.80$, $SD = 0.41$, paired $t = -2.88$, $p < .01$.

Finally, in the losing groups we analyzed their view of the degree to which all members contributed an equal amount of effort. Losing groups rated equal contribution higher before the winners were announced ($M = 4.3$, $SD = 0.77$), and lower after they knew they were not the winners ($M = 4.03$, $SD = 0.89$, paired $t = 2.70$, $p < .01$). Similarly, for the survey question which gauged individual rating of personal individual performance within the group context, losing groups also rated themselves higher before-the-fact ($M = 3.90$, $SD = 0.98$, $M = 3.58$, $SD = 1.11$, paired $t = 2$, $p < .01$). There were no such changes between survey time one and time two for the winning groups.

DISCUSSION

The hypotheses that both group performance and individual performance would be greater when accountability was present (e.g., an evaluator) were not supported. This is contrary to results found by Sheppard and Taylor (1999) regarding motivation to work hard for a valued outcome if it is believed that individual effort matters. Our hypotheses that group performance and individual performance would be greater when motivation (e.g., reward) was present were also not supported. The presence of a reward did not increase the level of group or individual performance, but in the opposite direction, the absence of the reward actually resulted in the higher group scores. This again is contradictory to the research findings of Sheppard and Taylor (1999), whose study resulted in a significant relationship between the presence of reward and heightened group performance.

These surprising findings offer several possible implications. It is possible that the study already involved a high level of accountability and/or motivation. For instance, the task was dependent upon group effort, the participants were gaining course credit, and the task appeared to be fun for the participants and may have been motivating in its own right. Future research may try to reduce these effects. In particular, future research may choose to manipulate the reward to be more immediate, desirable, or tangible. There is some in the literature in support of these "reverse" findings. For example, one particular theory is the presence of reward (reinforcement) actually threatens an individual's power to determine his/her own actions. The introduction of a reward, therefore, creates an illustration of control or, in other words, the perception that reinforcement has more control over one's behavior than one has

over one's own behavior (Eisenberger & Cameron, 1996). This perceived manipulation distracts the participant from the task, reducing intrinsic motivation, or the desire to participate in the task for its own sake (Schrof, 1993). Our findings, along with other research yielding similar results, suggest a complex relationship between motivation to complete a task and the presence of evaluator and/or the presence of reward.

The results also show that groups with an evaluator present actually made fewer errors, regardless of their lesser performance on the task. Furthermore, the highest error rates were observed among groups where there were neither an evaluator nor a reward present, and the lowest rates with groups including an evaluator and a reward. These first findings somewhat support our hypotheses in that "performance" would be considered better in the result with the fewest number of errors made. However, the latter finding of an interaction – where the highest error rates were found when there was no presence of either reward or evaluation. There was no motivation (i.e. reward) to push the participants to finish the task more quickly; however, perhaps the resulting high error rates occurred simply because the individuals were in a hurry, distracted, or plainly uninterested. With no evaluator present, the participants did not have to worry about themselves being singled out as the unproductive one; therefore, their lack of care with the task was allowed to interfere and thus contributed to the group's overall deduction of points. On the other hand, the low error rates among groups with both a reward and evaluator present could simply be due to the motivation to perform well and the conscious awareness of being observed individually as well as part of a team. Future research should again consider what is truly the motivating factor of this study, and thus, design the method and task accordingly. It is clear that future research may be well served by focusing on the distraction as a factor on productivity and what variables affect the level of distraction.

The findings from the satisfaction analyses were more clearly in line with previous research and our expectations. Participants who were in losing groups rated their own and their group's effectiveness higher before they knew the results, and lower after they knew they were not winners. Participants who were in the winning groups showed the opposite finding, their assessments of their own effectiveness and their group's effectiveness increased after they found out the results. Their satisfaction also increased. The satisfaction findings suggest that "losers" are more likely to criticize themselves and involved others when the group is unsuccessful; whereas "winners" are less likely to criticize their winning group. Winning or losing also affects individual's overall impression of the task. These findings remain important to the business world and those interested in worker morale – suggesting that managers need to be mindful of the impact of "losing" on the group members.

Overall, while our results were contrary to expectation, they indicate that more research on the role of evaluation and reward is necessary. If our results were to be reliably replicated, they would have some serious implications about the business world's assumptions regarding traditional reward structures.

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Table 1.

ANOVA for Group Productivity as Measured by Trivia Scores

Group	Present			Not Present		
	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>
Evaluator	25.83	12.25	30	4.17	12.94	0
Reward	24.17	9.92	30	35.83	13.59	30

Source	Between Subjects		
	<u>df</u>	<u>F</u>	<u>p</u>
Evaluator (E)	1	8.140	.006
Reward (R)	1	15.953	.000
E * R	1	.000	1.000

Table 2.
ANOVA for Group Error Rates on Trivia Game

Group	Present			Not Present		
	<u>M</u>	<u>SD</u>	<u>n</u>	<u>M</u>	<u>SD</u>	<u>n</u>
Evaluator	5.000	4.152	30	6.667	5.662	30
Reward	5.833	5.427	30	833	4.564	30

Source	Between Subjects		
	<u>df</u>	<u>F</u>	<u>p</u>
Evaluator (E)	1	1.867	.177
Reward (R)	1	.000	1.000
E * R	1	7.467	.08