The Effects of Goal Setting and Group Size on Performance in a Social Dilemma

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Abstract
The effect of self-set personal and assigned group goal setting on an individual's behaviour in 3- and 7-person groups confronted with a social dilemma was investigated. Participants (N = 274) earned between $1.82 and $4.94 by investing money in either a personal account or a group account. Self-set personal goals that were compatible with an assigned group goal led to higher group performance than self-set incompatibly high ("greedy") personal goals. Collective-eficacy in making money, outcome expectations that cooperation with others leads to the attainment of the group's goal, and group goal commitment correlated positively with group performance. Individuals in 7-person groups (N = 28) were less cooperative than those in 3-person groups (N = 26). They had lower collective-eficacy, lower outcome expectations, and lower commitment to the group goal than did individuals in 3-person groups. Furthermore, individual performance in 7-person groups was significantly lower than individual performance in 3-person groups. A social dilemma appears to be a boundary condition for the normally positive effect of group goal setting on group performance.

Résumé
On a examiné l'effet de l'établissement d'objectifs personnels et d'objectifs fixés pour un groupe sur le comportement individuel, dans des groupes de trois et de sept personnes, en face d'un dilemme social. Les participants (N = 274) gagnaient de 1,82 $ à 4,94 $ en plaçant de l'argent dans un compte personnel ou collectif. Les objectifs personnels compatibles avec un objectif fixé pour le groupe ont mené à un rendement collectif supérieur à celui obtenu par des buts personnels incompatibles parce qu'excésifs. L'efficacité collective pour ce qui est de gagner de l'argent, les résultats attendus (selon lesquels la coopération mène à l'atteinte des objectifs du groupe) et l'engagement du groupe envers son objectif présentaient une corrélation positive avec le rendement du groupe. Les membres de groupes de sept personnes (N = 28) étaient moins coopératifs que ceux des groupes de trois personnes (N = 26). Ils présentaient des résultats plus faibles que ceux des groupes de trois personnes sur le plan de l'efficacité collective, des résultats attendus et de l'engagement envers le groupe. De plus, leur rendement était nettement inférieur à celui des groupes de trois personnes. Un dilemme social semble être une condition limite pour l'effet normalement positif de l'établissement d'objectifs de groupe, sur le rendement collectif.

Among the most robust findings in the behavioural science literature is that given high goal commitment, setting a specific, difficult goal increases performance significantly over that of urging individuals to "do their best" (e.g., Lee & Earley, 1992; Locke & Latham, 1990). Similar findings have been obtained regarding the effect of group goals on group performance. For example, a factor analysis revealed that setting a specific production goal by logging crews correlated positively with cords of wood harvested per employee hour (Ronan, Latham, & Kinne, 1973). Subsequent field experiments showed that logging crews with specific, high goals had higher productivity than crews who were urged to "do their best" (Latham & Kinne, 1974; Latham & Locke, 1975; Latham & Yukl, 1975). A meta-analysis involving 10 studies and 163 groups supported these findings. The mean performance level of groups with specific, high goals was almost one standard deviation higher than the performance of groups for which no goals were set (O'Leary-Kelly, Martocchio, & Frink, 1994).

Klein and Mulvey (1995) and Mulvey and Klein (1998) showed that the magnitude of the group goal is an important determinant of the level of performance achieved. Specifically, they found that the difficulty of a self-set group goal (i.e., a score on a group assignment that required investigating a human resource subfunction of an organization) correlated positively and significantly with group performance.

Laboratory experiments by Weldon and her colleagues (Weingart, 1992; Weingart & Weldon, 1991; Weldon,
Jehn, & Pradhan, 1991) identified the variables that mediate the effects of group goals on performance. These include effort and persistence, identification of strategies to attain group goals, performance monitoring, goal commitment, morale building communication, and extra-role behaviours.

In virtually all goal setting studies, working to attain the goal has been beneficial to both the individual and the group. Yet in organizational settings, goals are often in conflict so that working to attain the group's goal may be detrimental to the individual and vice versa. For example, managers are often rewarded monetarily for doing what is in the best interest of their respective divisions rather than doing what is in the best interest of the overall organization. This phenomenon is referred to in the social psychology literature as a social dilemma, where one's personal interests are in conflict with those of the group to which the person belongs. There are two important properties of a social dilemma (e.g., Komorita & Parks, 1995; Liebrand, Messick, & Wilke, 1992). First, there is a clear strategy that enables a maximum payoff for the individual at the expense of others. Second, if everyone chooses this strategy there is a suboptimal outcome whereby everyone loses more than that which would have occurred if everyone had worked toward the attainment of the group goal.

The issue of individual versus group goal setting is an important one given that people in organizations must balance their individually oriented behaviour with group level concerns. Yet goal setting researchers have largely ignored the issue of goal conflict in general (e.g., Locke & Latham, 1990; Locke, Smith, Erez, Chah, & Shaffer, 1994) and the potential conflict between individual and group goal setting in particular. The present study investigated whether a social dilemma is a boundary condition for the normally positive effect of specific, challenging group goals on subsequent group performance. Consequently, answers to whether there are main effects for assigned group goals for group performance, self-set personal goals for the individual's performance, and time on group performance in a social dilemma were sought.

In a bargaining study, Huber and Neale (1987) found that when negotiators set high personal goals for themselves, a level of conflict exists that precludes the problem solving behaviours necessary for an integrative solution. This is because negotiators focus on individual gain rather than on maximizing joint profitability. Similarly, Mitchell and Silver (1990) found that on an interdependent tower-building task, the assignment of a goal to the individual resulted in significantly lower group performance than the assignment of a group goal, the assignment of a group goal plus an individual goal, or urging people to "do their best." They concluded that assigning a specific, high goal to an individual directs attention away from strategies that enhance group performance.

However, Crown and Rosse (1995) showed that groupcentric individual plus group goals increased group performance on an interdependent grammar task over any other goal combination. This is because a groupcentric individual goal focuses attention on maximizing a person's contribution to the group whereas the focus of an egocentric goal is on maximizing the individual's performance. In conclusion, these studies suggest that if individuals have difficult goals for individual performance on a nonadditive task, group performance suffers. Thus, the following hypotheses were tested in a social dilemma:

H1a, b: Consistent with goal setting theory, there is a main effect for assigned group goals on group performance (1a) as well as for self-set personal goals on the individual's performance (1b).

Goal setting theory (Locke & Latham, 1990) states that goal commitment influences the effect of goals on performance. The role of commitment should also be critical to group performance in a social dilemma. Only if individuals are committed to the group goal will they set personal goals that do not maximize self-interest.

However, in social dilemma situations individuals may learn, over time, the futility of everyone engaging in non-cooperative behaviour, and that through cooperation they can obtain a better outcome than is the case when they focus only on maximizing personal gain (e.g., Allison & Messick, 1985; Bornstein, Erev, & Goren, 1994; Murnighan & Roth, 1983). This is because, over time, individuals have an opportunity to learn the structure of a social dilemma and coordinate their behaviour with that of other group members. Group size, however, can affect the level of cooperation and hence performance.

A robust finding in the social dilemma research is that cooperation declines as groups become large (e.g., Allison, McQueen, & Schaefer, 1992; Liebrand et al., 1992; Messick & Brewer, 1983). This is because specific "tit for tat" strategies to induce group members into mutual cooperation are less effective in large groups; the extent to which a group member feels accountable for the welfare of the group declines as group size increases; and the extent to which personal choice is identifiable decreases as group size increases. As group size increases beyond seven, however, the lack of cooperation in a social dilemma is unaffected (Liebrand, 1984). Therefore, the following hypotheses were tested:

H2: Commitment to the group's goal is higher in small groups than it is in large groups. A behavioural indicator of commitment to the group's goal is the difficulty level of a self-set personal goal. Thus it was hypothesized that the
mean self-set personal goal for participants in 7-person groups is significantly higher than the mean self-set personal goal in 3-person groups.  
H3a, b: Cooperation among members is higher in 3-person than in 7-person groups (3a), and this cooperation increases with time (3b).  
H4: Cooperation leads to higher earnings for an individual than self-serving behaviour.  
H5: The earnings for small groups parallel the results obtained for individuals’ cooperation. That is, performance of small groups increases with time.

Goldstein (1993) argued that process variables may provide important insights for the analysis of interventions in that they can help identify the source of effects. Bandura’s (1997) social-cognitive theory may provide a basis for explaining goal effects at the group level. Two variables that may explain the effect of assigned group goals on subsequent performance were investigated, namely, collective-efficacy and outcome expectancies.

Bandura (1997) defined collective-efficacy as the group’s shared belief in its joint capabilities to organize and execute the courses of action required to produce given levels of attainments. He argued that collective-efficacy influences the goals groups seek to attain, how they manage their resources, the strategies they construct, how much effort they put into their group endeavour, and their vulnerability to discouragement when collective efforts fail to produce quick results or encounter forcible opposition. Both laboratory and field studies have shown that collective-efficacy correlates positively with group performance (e.g., Mulvey & Klein, 1998; Prussia & Kinicki, 1996; Silver & Bufanio, 1996). Thus, the sixth hypothesis of the present study was that:

H6: There is a positive and significant correlation between collective-efficacy and subsequent group performance.

Few, if any, studies have examined collective-efficacy as a potential mediator of goal effects. Research with the individual as the unit of analysis (e.g., Earley & Lituchy, 1991; Meyer & Gellatly, 1988) has shown that self-efficacy mediates the relationship between assigned personal goals and individual performance. This is because assigning challenging goals for individuals conveys a belief in their abilities to attain them (e.g., Bandura, 1997; Salancik, 1977). Because group-level findings for efficacy may parallel individual-level findings, it was hypothesized that:

H7: Collective-efficacy mediates the relationship between group goal level and group performance.

Performance is also determined by the individual’s expectancy of desired outcomes as a result of successful performance (Bandura, 1997). The higher the expectancy that a certain behaviour or performance level will secure specific outcomes, the greater the motivation to perform the activity. Thus, even if individuals or groups have a high sense of efficacy, they are less likely to persist if outcome expectancies are low. Thus, the eighth hypothesis of the present study was:

H8: There is a positive and significant correlation between outcome expectancies and subsequent group performance.

Outcome expectancies may affect the strength of the relationship between goal assignment and group performance. Stated differently, outcome expectancies moderate the relationship between goal level and performance. This moderating effect is described such that a positive relationship exists between goal level and performance for those having high outcome expectancies, but a weaker or nonexistent relationship is observed for those having low outcome expectancies. Thus, the ninth hypothesis of the present study was:

H9: Outcome expectancies moderate the relationship between group goal level and group performance.

**METHOD**

**Experimental Design and Participants**

Of the 274 students who participated in the study, 145 were male and 115 were female. Fourteen participants did not indicate their gender. The participants were randomly assigned to conditions in a 3 (high, moderate, and “do best” group goal) × 2 (3-person, and 7-person group) × 3 (blocks) factorial design. Different goal levels (high, moderate) were included so that the effects of having specific group goals of varying difficulty levels in a social dilemma context could be explored. There were 26 3-person groups and 28 7-person groups. Group goals and group size were between-group factors, and blocks (repeated measures) was a within-group factor.

**Experimental Task**

The task was one proposed by Marwell and Ames (1979), and subsequently used by others (e.g., Fleishman, 1988; Komorita, Parks, & Hulbert, 1992; Sell, Griffith, & Wilson, 1993). In brief, participants were informed that they would be working as a group on a decision-making task that measures their ability to make money. The amount of money that they could earn was dependent on their own decisions as well as the decisions of the other group members. This task was chosen because working to make money for one’s team and oneself is a requirement in many organizational settings.

Each group member was required to make a series of
nine financial decisions as to how to invest 25 cents. There were two options, namely, investing the money in one’s personal account, or in a joint account shared with the others. Participants were allowed to contribute all or part of their monetary resources to either the personal account or to the joint account. The participants were informed that if they invested money in the joint account, their contribution would double in value (e.g., 15 cents becomes 30 cents). In contrast, contributions to one’s personal account would not be doubled (nor anything else). Moreover, participants were told that each group member would receive an equal share of the money from the joint account regardless of how much money he or she had actually contributed to it. Therefore, at the end of each investment trial, the amount of money that each group member earned was the amount of money in one’s personal account plus a share from the joint account.

The dilemma was that it was potentially profitable to allocate all of one’s monetary resources to one’s personal as opposed to the joint account. Put differently, the reward structure of the task was such that participants who allocated the 25 cents to their personal account would take advantage of those individuals who contributed all or a significant amount of their monetary resources to the joint account. However, if others behaved in a similarly self-enhancing fashion, each participant’s earnings would be less than if the money had been allocated to the joint account.

Multiple investment decisions allowed participants to observe fellow group members, and to experience the consequences of one another’s actions. To prevent such knowledge from influencing their cooperative or self-enhancing behaviour, the participants were not told there were nine trials (e.g., Burrough & Roth, 1983; Rutte, Wilke, & Messick, 1987; Sell et al., 1993).

Because the participants worked for money (i.e., they were facing an actual dilemma), their reputation within the school was at stake. Anecdotal data indicated that task involvement was high regarding who among them was most capable of earning money. Thus, there is reason to believe that the experimental design had both external (e.g., communication was allowed, all choices were public, and there was the opportunity to earn money) and internal validity.

**Procedure**

Each group member received a package explaining the task requirements. At the end of the instructions, the importance of setting a group goal on subsequent performance was explained. In order to ensure that both moderately difficult and highly difficult group goals were set, the goal was assigned by the researcher. This procedure is not unlike goals that are assigned by an instructor in an educational setting or a manager in a work setting. Moreover, studies (e.g., Latham, Erez, & Locke, 1988) have shown that goals assigned with a rationale have the same effect on performance as participatively set goals. The goals, based on the recommendations of Wood and Locke (1990), were either one that 50% or one that only 10% of the groups in a pilot study had attained.

The instructions were: “To make money typically requires groups to think strategically. Hence, it is important that

*Do Best Group Goal Condition:* this group does its best to think of ways to make as much money as possible (3-person and 7-person groups).

*Specific Group Goal Condition:* this group commits to a specific, difficult yet attainable goal to make money. In previous sessions, the average amount of money that groups made was $12.00 (3-person, moderately difficult goal) / $13.00 (3-person, highly difficult goal) / $26.00 (7-person, moderately difficult goal) / $31.00 (7-person, highly difficult goal). Therefore, this group’s goal is to think of ways to make $12.00 / $13.00 / $26.00 / $31.00 or more.”

In addition, each participant was asked to set a specific personal goal regarding the amount of money that he or she intended to earn.

Each of the nine trials was identical in format. All participants received a decision slip on which to record the amount of money to be allocated to the personal account, and how much money to invest in the joint account. Once the contributions had been recorded, the experimenter collected the slips. The experimenter then announced the amount of money each group member allocated to both the personal and the joint account, and calculated the amount of money that comprised each group member’s share of the payoff from the joint account. Group members were also told the amount of money that they and their colleagues earned during each trial. Providing feedback was necessary because goals in the absence of feedback have a minimal effect on performance (Erez, 1977).

Participants were allowed to discuss their decisions with the other group members for up to three-minutes, three times during the task, namely, prior to trials 1, 4, and 7. Communication among group members frequently occurs in real-work settings, and has been shown to promote cooperation in social dilemma situations (e.g., Kerr & Kaufman-Gilliland, 1994; Komorita & Parks, 1995).

After the ninth trial, participants completed a questionnaire that included manipulation checks (see Measures). Participants were debriefed and thanked for their participation.
Measures

Performance. Performance was operationalized as the amount of money earned by both the individual and the group. The maximum amount of money that could be made by 3- and 7-person groups was $13.50 and $31.50, respectively. Maximum performance could only be attained if all group members consistently cooperated, that is, contributed all their monetary resources to the joint account.

Personal goal. Prior to trial 1 each group member was asked to set a specific personal monetary goal. The instructions stated that a realistic personal goal would fall between $1.50 and $5.25 for 3-person groups, and $0.75 and $6.25 for 7-person groups.

Goal commitment. Commitment to the assigned group goal was measured using seven 5-point Likert-type items taken from Hollenbeck, Klein, O’Leary, and Wright (1989). Consistent with the studies conducted by Weingart and Weldon (1992) and Mulvey and Klein (1998), the items were modified to refer to group rather than individual goals [e.g., “It is quite likely that this group goal may need to be revised” (reverse scored)]. Scores could range from “completely disagree” (1) to “completely agree” (5). Measures of commitment to the group goal were taken three times, namely, prior to trials 1, 4, and 7.

Collective-efficacy. Gist (1987) suggested three methods for assessing collective-efficacy, namely, aggregating perceptions of individual self-efficacy, averaging of individuals’ responses to perceptions of collective-efficacy, and asking group members to collectively fill out a single questionnaire. There is no consensus on which method to use. Bandura (1997) argued that measuring collective-efficacy by having group members form a consensus view of their collective-efficacy is problematic because social influence processes may obscure differences among members on this issue. Similarly, Lindsey, Mathieu, Heffner, and Brass (1996) suggested that while collective-efficacy may represent the group equivalent of individual self-efficacy, it is not simply the aggregate of individual group members’ self-efficacies. Therefore, the second method suggested by Gist (1987) was used in the present study.

Participants were asked their individual perceptions of collective-efficacy (e.g., “I feel my group can make $12.00 on this task”), which were then aggregated. Both collective-efficacy magnitude and strength in making money were measured. Measures of collective-efficacy magnitude and strength were taken three times, namely, prior to trials 1, 4, and 7. Fifteen levels were assessed, ranging from earning $6.75 to $13.75 for 3-person groups, and $18.00 to $32.00 for 7-person groups. Collective-efficacy magnitude was operationalized as the total number of “Yes” responses to the questions above.

Efficacy strength was the sum of the rating scores across the 15 performance levels. The ratings were made in terms of a 10-point scale ranging from “no confidence at all” (1) to “total confidence” (10). This operationalization of collective-efficacy is consistent with studies conducted by Mulvey and Klein (1998) and Prussia and Kinicki (1996).

Outcome expectancies. The anticipated outcomes of contributing to the joint account were measured using nine 5-point Likert-type items (e.g., “I believe that a feeling of trust will arise so that each group member will allocate money to the joint account” and “I believe other group members will take advantage of me”). These outcome items about trust, that is, beliefs whether other group members would contribute money to the joint account, were identified in a pilot study. Scale scores could range from “completely disagree” (1) to “completely agree” (5). Measures of outcome expectancies were taken three times, namely, prior to trials 1, 4, and 7.

Manipulation checks

Clarity of instructions. Clarity of instructions was measured using two items (e.g., “I had a full understanding about the procedures of the experiment”). Scores could range from “not at all” (1) to “very much so” (5). In addition, based on a scenario in which three (seven) individuals allocated money to both the personal and the joint account, participants were asked to answer the following questions: (1) “How much money did you receive from the joint account?”; (2) “How much money did you earn?”; (3) “How much money did the other participants earn?”, and (4) “How much money did the group earn?” Answers to these questions were checked prior to participants making their first investment decision. If an incorrect answer was given to any of these four questions, the experimenter could explain the correct answer in detail.

Goal specificity. Goal specificity was measured using three 5-point Likert-type items [e.g., “To what extent was there uncertainty as to the amount of money to be earned by the group” (reverse scored)] adapted from Winters and Latham (1996). Scale scores could range from “not at all” (1) to “very much so” (5).

Member familiarity. Two questions were included that measured how familiar the group members were with one another. These questions were: “How often do you interact socially with the others in your group?” [scale scores could range from “almost never” (1) to “a great deal” (5)], and “How well do you know the others in your group?” [scale scores could range from “not at all” (1) to “very much so” (5)].

Level of Analysis

The majority of the hypotheses identified the group as the
TABLE 1  
Mean Group Performance for Each Experimental Condition  
(Standard Deviations in Parentheses)

<table>
<thead>
<tr>
<th>Group size</th>
<th>Assigned Group Goal Level</th>
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<tbody>
<tr>
<td></td>
<td>Do best</td>
<td>Moderate</td>
</tr>
<tr>
<td>3-person</td>
<td>$11.57</td>
<td>$12.09</td>
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<tr>
<td></td>
<td>(1.62)</td>
<td>(1.14)</td>
</tr>
<tr>
<td>7-person</td>
<td>$26.15</td>
<td>$26.98</td>
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<tr>
<td></td>
<td>(4.43)</td>
<td>(4.32)</td>
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Note. Cell n’s range from 8 to 12.

unit of analysis. Collective-efficacy, outcome expectancies, and goal commitment were assessed at the individual level. Sufficient perceptual agreement within groups must be demonstrated in order to meaningfully aggregate individual-level responses. The composition rule that was applied in the present study involved the "referent-shift consensus" (Chan, 1998). That is, the referent in the questions that comprised the measurement scales for collective-efficacy, outcome expectancies, and goal commitment involved the group rather than the individual. Within-group consensus was then used to justify the aggregation of individuals’ perceptions to represent the value of the group-level constructs. Specifically, two empirical criteria were assessed to evaluate the appropriateness of the aggregations. First, a series of one-way ANOVAs with group as the independent variable and collective-efficacy, outcome expectancies, and goal commitment as the dependent variables indicated that between-group variance exceeded within-group variance. Second, the eta-squared values or ICC(1)’s from a one-way random effects ANOVA were calculated. These values were corrected for group size and missing values (e.g., Bliese & Halverson, 1998; Yammarino & Markham, 1992). For example, the eta-squared values indicate that 26% to 57% of the variance in individual level responses for outcome expectancies can be explained by the group level properties of the data. In general, the eta-squared values increased as time progressed. The results indicated that aggregation of the individual level data for collective-efficacy, outcome expectancies, and goal commitment was appropriate (even though initial values for the measures of collective-efficacy and commitment were close to zero).

RESULTS

Manipulation Checks

Clarity of instructions. The coefficient alpha for the 2-item scale was .84. A 3 (group goal assignment) x 2  (group size) ANOVA indicated that there were no significant differences in perceived clarity of the instructions across conditions. The grand mean of 4.50 (SD = 0.75) indicates that the participants understood the experimental procedures.

Goal specificity. The coefficient alpha for the 3-item scale was .73. A t-test indicated there was a significant difference in perceived specificity of the group goal between participants in the “do best” condition (M = 2.82, SD = 0.94) and participants who had a specific (M = 3.47, SD = 0.98) group goal; t(245) = 26.72, p < .001, and d = 0.64.

Member familiarity. The coefficient alpha for the 2-item scale was .75. A 3 (group goal assignment) x 2 (group size) ANOVA indicated that there were no significant differences in member familiarity across conditions. The grand mean of 3.01 (SD = 1.08) indicates that the group members were familiar with one another.

Goal difficulty. The goal difficulty levels used in the present study were based on a pilot study. To test if these goal levels were appropriate for the present population, the number of times groups reached the moderately difficult and highly difficult group goals were calculated. The moderately difficult group goal was reached 5 out of 8 times by both 3-person and 7-person groups. The highly difficult group goal was reached 2 out of 8 times by 3-person groups, and 1 out of 8 times by 7-person groups. These findings suggest that the goal difficulty levels were appropriate.

Hypotheses

Personal and group goals. Table 1 shows the average amount of money made by groups across the experimental conditions. The minimum and maximum amounts of money earned by 3-person groups were $9.23 and $13.50, respectively. The corresponding values for 7-person groups were $19.54 and $31.50. T-tests indicated that neither in 3-person groups (t(25) = 0.84, p > .05, and d = 0.31) nor in 7-person groups (t(27) = 0.22, p > .05, and d = 0.18) did a specific group goal increase performance significantly over that of groups urged to "do their best." Furthermore, t-tests indicated that neither 3-person nor 7-person groups assigned a highly difficult group goal outperformed groups assigned a moderately difficult group goal (t(15) = 0.01, p > .05, d = 0.04, and t(15) = 0.01, p > .05, d = 0.06 for 3-person and 7-person groups, respectively).

Table 2 shows the mean values for the individual’s personal goals and the person’s subsequent performance across experimental conditions. The minimum and maximum amounts of money earned by individuals in 3-person groups were $2.89 and $4.50, respectively. The corresponding values for individuals in 7-person groups were $1.82 and $4.94. The correlation between personal goal level and the amount of money made by the participants was r(77) = .14 (p > .05) for individuals in 3-person
groups and $r(186) = .05$ ($p > .05$) for participants in 7-person groups.

Hypotheses 1a and 1b were thus rejected. It would appear that a social dilemma is a boundary condition for the positive effect normally obtained for goal setting on the performance of the individual as well as the group.

**Goal commitment.** One purpose of the present study was to examine the effect of conflicting personal and group goals on the group's performance. In the present study, an incompatibly high personal goal was defined as the intention to earn $4.51$ or more. This is because attaining $4.51$ or more could only be achieved by behaving in a self-serving fashion, that is, contributing little or no money to the joint account and taking advantage of those group members who did. This strategy, however, does not work if others do likewise. In contrast, group performance is maximized if each group member has a personal goal of $4.50$. A personal goal of $4.50$ matches the group goal, and can only be attained if all the money is given to the joint account.

The mean self-set personal goal for participants in 3-person groups was $3.92$ ($SD = .97$); the corresponding value for participants in 7-person groups was $4.75$ ($SD = 1.22$). The difference was statistically significant, $t(177.57) = 5.87$, $p < .001$, and $d = 0.75$. Thus the second hypothesis was supported. Goal commitment is higher in a small than it is in a large group.

The coefficient alphas for the 7-item attitudinal measure of goal commitment scale were .78, .85, and .86 for blocks 1, 2, and 3, respectively. The mean values for commitment to the group goal across conditions are shown in Figure 1. A repeated measures ANOVA on commitment with group size as a between-group factor and time as a within-group factor indicated a marginally significant effect of group size, $F(1, 27) = 3.69$, $p < .05$, and $f = 0.37$. Goal commitment was higher in 3-person groups than in 7-person groups during blocks 1 ([29] = 1.72, $p < .09$, and $d = 0.60$), 2 ([27] = 1.96, $p < .06$, and $d = 0.71$), and 3 ([27] = 1.76, $p < .09$, and $d = 0.68$). These results provide further support for the second hypothesis.

**Group size.** To examine the effect of self-set personal goals on the groups' performance, the goal difficulty level of the participants' personal goal was aggregated for each group to represent a measure of cooperative goal orientation. The Pearson product correlation between aggregated self-set personal goal level and the amount of money made by the group was $r(25) = .38$ ($p < .05$) for 3-person groups and $r(27) = -.16$ ($p > .05$) for 7-person groups. A subsequent chi-square test indicated that participants in 7-person groups set "greedy" personal goals that were incompatible with that of maximizing the group's performance more frequently than did those individuals in 3-person groups, $X^2(1) = 46.52$, $p < .001$. Specifically, only 24% of the participants in 3-person groups had a personal goal of making $4.51$ or more while 60% of the participants in 7-person groups set a self-serving goal. This finding provides support for hypothesis 3a, namely, that cooperation among group members is higher in 3-person than in 7-person groups.

**Time.** A repeated measures ANOVA on the monetary contribution to the joint account with group size as a between-group factor and time as a within-group factor was conducted to test whether participants in 3-person groups were more cooperative, that is, contributed more money to the joint account than participants in 7-person
groups. There was no significant main effect for group size, $F(1, 241) = 1.23, p > .05$, and $f = 0.16$. However, the results indicated a significant interaction effect between group size and time, $F(2, 482) = 4.29, p < .05$, and $f = 0.23$. Specifically, participants in 3-person groups contributed significantly more money to the joint account during blocks 2 ($t(179.98) = 2.38, p < .05$, and $d = 0.30$) and 3 ($t(188.6) = 1.71, p < .08$, and $d = 0.23$) than did participants in 7-person groups (see Figure 4). These findings provide additional support for hypothesis 3a. Furthermore, the results indicated that participants in 3-person groups contributed significantly more money to the joint account during blocks 2 ($t(74) = 3.76, p < .001$, and $d = 0.41$) and 3 ($t(74) = 4.94, p < .001$, and $d = 0.55$) than during block 1 (see Figure 1). There were no significant differences in the amount of money contributed to the joint account during blocks 1, 2, and 3 for individuals in 7-person groups. These findings provide support for hypothesis 3b.

The higher level of cooperation among participants in 3-person groups relative to participants in 7-person groups led to a significant difference in the amount of personal money earned. The minimum and maximum amounts of money earned by participants in 3-person groups were $2.89 and $4.50, respectively ($M = 3.96, SD = 0.46$). The corresponding values for participants in 7-person groups were $1.82 and $4.94 ($M = 3.79, SD = 0.62$). The difference in mean individual performance was statistically significant, $t(188.31) = 2.40, p < .05$, and $d = 0.32$. Thus cooperation led to higher individual earnings than self-serving behaviour. Hence, the fourth hypothesis was supported.

Table 3 shows the average amount of money made by 3-person and 7-person groups across blocks. A repeated measures ANOVA on the amount of money earned by groups during each block indicated a significant within-effect for time for 3-person groups ($F(2, 50) = 5.46, p < .01$, and $f = 0.32$), but not for 7-person groups ($F(2, 54) = 0.24, p > .05$, and $f = 0.10$). Planned comparisons indicated that the amount of money made by 3-person groups during blocks 2 ($t(25) = 2.30, p < .05$, and $d = 0.47$) and 3 ($t(25) = 3.08, p < .01$, and $d = 0.53$) was significantly greater than the amount of money made during block 1. Thus the fifth hypothesis was supported.

**TABLE 3**

Mean Group Performance for 3- and 7-person Groups During Blocks 1 - 3 (Standard Deviations in Parentheses)

<table>
<thead>
<tr>
<th>Group size</th>
<th>Block 1</th>
<th>Block 2</th>
<th>Block 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-person</td>
<td>$3.83$</td>
<td>$4.06$</td>
<td>$4.12$</td>
</tr>
<tr>
<td></td>
<td>$(0.46)$</td>
<td>$(0.44)$</td>
<td>$(0.51)$</td>
</tr>
<tr>
<td>7-person</td>
<td>$9.10$</td>
<td>$9.11$</td>
<td>$9.27$</td>
</tr>
<tr>
<td></td>
<td>$(1.17)$</td>
<td>$(1.26)$</td>
<td>$(1.50)$</td>
</tr>
</tbody>
</table>

**Figure 2.** Mean values for collective-efficacy.

**Explanatory Variables**

The mean values for collective-efficacy, outcome expectations, and commitment to the group goal across conditions are shown in Figures 2, 3, and 4.

**Collective-efficacy.** The correlations between collective-efficacy magnitude and collective-efficacy strength were $r(202) = .75 (p < .001)$, $r(179) = .78 (p < .001)$, and $r(172) = .79 (p < .001)$ for blocks 1, 2, and 3, respectively. These measures were converted to z-scores (Locke & Latham, 1990) and summed to derive a total collective-efficacy score. The Pearson product correlations with group performance were positive and significant for the last two blocks; the correlations were $r(26) = .22 (p > .05)$, $r(24) = .47 (p < .01)$, and $r(24) = .60 (p < .001)$ for 3-person groups, and $r(27) = .28 (p > .05), r(26) = .57 (p < .001)$, and $r(26) = .76 (p < .001)$ for 7-person groups for blocks 1, 2, and 3, respectively. Thus the sixth hypothesis was largely supported.

A repeated measures ANOVA on collective-efficacy with goal assignment and group size as between-group factors and time as a within-group factor indicated that the main effect for goal assignment ($F(2, 44) = 0.60, p > .05$, and $f = 0.18$) and the interaction between goal assignment and group size ($F(2, 44) = 0.71, p > .05$, and $f = 0.33$) were not significant. Consequently, no mediator analyses were conducted (see Baron & Kenny, 1986). Therefore the seventh hypothesis was rejected.

Nevertheless, a marginally significant between-effect for group size on collective-efficacy was found, $F(1, 44) = 3.26, p < .07$, and $f = 0.27$. Subsequent t-tests revealed that collective-efficacy was significantly higher for 3-person groups than for 7-person groups during blocks 2 ($t(48) = 2.01, p < .05$, and $d = 0.55$) and 3 ($t(48) = 2.64, p < .01$, and $d = 0.71$). In addition, a significant interaction effect between group size and time was found, $F(2, 88) = 4.44, p < .01$, and $f = 0.33$. With time,
collective-efficacy increased for 3-person groups, but remained unchanged for 7-person groups (see Figure 2).

**Outcome expectancies.** The coefficient alphas for the 9-item scale were .77, .83, and .85 for blocks 1, 2, and 3, respectively. With the exception of the first block of trials for the 3-person groups, outcome expectancies of cooperating with other group members to attain the group's goal correlated positively and significantly with the amount of money earned. The correlations for 3-person groups were r(26) = -.17 (p > .05), r(24) = .42 (p < .05), and r(24) = .45 (p < .05) for blocks 1, 2, and 3, respectively; the corresponding correlations for 7-person groups were r(27) = .51 (p < .01), r(26) = .61 (p < .001), and r(26) = .77 (p < .001). Thus the eighth hypothesis was largely supported.

Hierarchical regression analysis was conducted to test whether the hypothesized relationship between group goal level and performance changed as a function of outcome expectancies. Specifically, for each block, the product of goal level and outcome expectancies was added to the regression equation, as described by Baron and Kenny (1986) and Cohen and Cohen (1983). A moderating effect is indicated by a significant interaction between goal level and outcome expectancies while the main effects for goal level and outcome expectancies on performance are controlled. No evidence was found that outcome expectancies moderate the relationship between group goal level and group performance for either 3-person or 7-person groups. Thus the ninth hypothesis was rejected.

Nevertheless, a repeated measures ANOVA on outcome expectancies with group goal assignment and group size as between-group factors and time as a within-group factor indicated a significant between-effect for group size, F(1, 48) = 20.17, p < .001, and f = .53. Outcome expectancies were significantly higher in 3-person groups than in 7-person groups during blocks 1 (t(51) = 3.01, p < .001, and d = 0.78), 2 (t(48) = 4.40, p < .001, and d = 1.05), and 3 (t(48) = 4.19, p < .001, and d = 1.03). In addition, a significant interaction effect between group size and time was found, F(2, 96) = 6.18, p < .01, and f = 0.57. With time, outcome expectancies decreased for 7-person groups, but remained unchanged for 3-person groups (see Figure 3).

**Regression analysis.** To tie together the above findings for collective-efficacy, outcome expectancies, and group size, a regression analysis for the third trial was conducted. The criterion was the amount of money contributed to the joint account. The results indicated that collective-efficacy (t = 2.21, p < .05), group size (t = 1.98, p < .06), and the interaction between outcome expectancies and group size (t = 2.11, p < .05) predicted the level of cooperation, F(5, 39) = 6.83, p < .001. The adjusted R² was .40.

**DISCUSSION**

The present study is among the first in the organizational psychology literature to examine what occurs when individuals with both a personal and a group goal are confronted with a dilemma as to which goal to attain. The theoretical and practical significance of the study is as follows. First, with regard to Locke and Latham's (1990)

3 Goal commitment was omitted from the regression analysis for two reasons. First, this construct correlated highly with collective-efficacy and outcome expectancies, and hence may pose threats to the interpretation of the results of the regression analysis (Pedhazur, 1982). An explanation for these high correlations is that both efficacy beliefs and outcome expectancies have been shown to be determinants of goal commitment (Latham, Locke, & Erez, 1988). Thus, the construct of goal commitment may, to some extent, be redundant. Second, goal commitment was not measured for the "do your best" group goal conditions. Therefore, by omitting this variable from the analyses, sample size was increased.
goal setting theory, the study increases knowledge of the conditions under which specific, difficult group goals are effective. It would appear that a social dilemma is a boundary condition of goal setting. No main effect for personal or group goal on subsequent performance was found. Interpreting a null result can be problematic, especially when the sample size is relatively small. But the pattern of means in Table 1 strongly suggests that there was probably no main effect for goal setting operating, as the means for the different goal setting conditions are very similar for both 3- and 7-person groups. However, high personal goals that are compatible with the group's goal of maximizing performance enhance group performance; in contrast, "greedy" or self-enhancing personal goals have a detrimental effect on a group's performance. Individuals in small groups are more cooperative than those in large groups. A likely explanation for this finding is that it is relatively easy in small groups to reach agreement on strategies to attain an objective. Agreement on strategies leads to high efficacy and outcome expectancies (Latham, Winters, & Locke, 1994; Sejits & Latham, 1999).

Second, with regard to Bandura's (1986, 1997) social-cognitive theory, the study provides evidence that group-level results parallel individual-level findings. Collective-efficacy correlated positively and significantly with group performance. These findings are consistent with previous studies (e.g., Lindsley, Mathieu, Heffner, & Brass, 1996; Prussia & Kinicki, 1996; Silver & Bufano, 1996) and thus provide additional support for Bandura's (1997) assertion that the concept of self-efficacy can be extended to groups.

The findings with regard to outcome expectancies suggest that people are likely to exert effort on a task if they expect that goal-directed behaviour leads to a desired outcome. In a social dilemma, individuals may not commit to a specific, challenging group goal when they doubt that other group members will commit to doing what is in the best interest of the group. Inherent in a dilemma is uncertainty as to whether it is worthwhile to abandon one's personal goal to pursue the group's goal. Thus, a practical implication of this finding is to coach employees that over time exploitation often generates retaliatory behaviour. Moreover, it is important for organizations to design incentive systems that reward commitment to the group's goals.

Third, with regard to the social dilemma literature, the results of the present study suggest that individuals in small groups do not consistently pursue their self-interest. With time, individuals in small groups are likely to learn the penalty of engaging in non-cooperative behaviour, and learn that through cooperation it is possible to obtain an optimal outcome. As such, the social dilemma used in the present study was a problem-solving or a "trust learning" task.

Limitations and Future Research

The limitations of the present study suggest areas for future research. First, the results are based on a 70-minute laboratory task. Manipulating the independent variables of interest in a field setting would be arguably unethical (e.g., encouraging individuals to set personal goals that are in conflict with goals of the department or organization). Nevertheless, the present study needs to be replicated with individuals working in groups or departments that are competing for scarce resources. Possible research designs include case, ethnographic, and correlational studies.

Second, Zander (1994) argued that in groups one can have each member's goal for the group, the group's goal for the group, the group's goal for each member, and each member's goal for self. The present study examined only the group's goal for the group and each group member's goal for self. Zander's taxonomy of goals in a group provides a framework for future research to tease apart the differential effects of individual and group goals on group performance.

Third, the content of communication among participants should be measured. Systematic measurement of communication (e.g., using written transcripts of all conversation among group members working on the task produced from work-session videotapes) might provide information that pertains to specific group processes, and how these processes influence group performance. Examples include whether communication is task relevant, whether group members make public commitments to cooperate with one another, an increase in the use of normative appeals for cooperation, building morale among group members, and what specific negotiation strategies are used to solve conflicts.

Fourth, individuals were told to self-set personal goals after being assigned the group's goal. As such, it is possible that knowledge of the group goal biased the selection of the personal goal. This sequence, however, often occurs in organizational settings. Nevertheless, a stronger social dilemma may be created by assigning a group goal after convincing individuals to set a specific, challenging individual goal.

SUMMARY

The present study examined the effects of assigned group goals and self-set personal goals on an individual's behaviour in small and large groups and on group performance in a money-oriented social dilemma. Collective-efficacy, outcome expectancies, and goal commitment were examined to investigate the process through which group goals may affect performance. The results showed that assigned group goals had no effect on group performance. Self-serving goals for individual performance had a detrimental effect on group perfor-
mance whereas personal goals that were compatible with the group’s goal of maximizing earnings contributed to higher group performance. While no evidence was found that collective-efficacy, outcome expectancies, and goal commitment mediated or moderated group goal effects, the results indicated that they did correlate with the group’s performance. Thus the results of the present study suggest at least four points of leverage for intervening to facilitate group performance in a social dilemma: (1) alignment of individual and group goals; (2) fostering collective beliefs of efficacy; (3) increasing individuals’ beliefs that cooperation will lead to positive outcomes; and (4) developing commitment to group goals. It would appear that large groups in particular would benefit from such interventions. This is because the data indicated that members of large groups had higher levels of self-serving personal goals, and reported lower levels of collective efficacy, outcome expectancies, and goal commitment than did members of small groups.

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