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Self-Efficacy Theory: Implications for Social Facilitation and Social Loafing

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Two experiments indicate that the areas of social facilitation and social loafing are complementary and can be conceptualized in terms of self-efficacy theory. In Experiment 1, efficacy expectancies were manipulated by false performance feedback, and outcome expectancies were manipulated by 3 group conditions (alone, coaction, and collective). In Experiment 2, efficacy expectancies developed spontaneously while participants performed easy or difficult tasks, and outcome expectancies were manipulated by 3 evaluative conditions (alone, evaluation, and no evaluation). Consistent with social facilitation research, high-efficacy evaluated participants performed better than alone participants, whereas low-efficacy evaluated participants performed worse than alone participants. Consistent with social loafing research, high-efficacy nonevaluated participants performed worse than evaluated participants, whereas low-efficacy nonevaluated participants performed better than evaluated participants.

The effect of the presence of others on individual task performance has been a question of interest to social psychologists since the field's inception. Social facilitation and social loafing are two lines of research that have examined such effects, with each area having roots that trace back to two of the first social psychological experiments. Social facilitation research dates back to Triplett's (1898) experiment with children winding fishing reels; children wound more line when working side-by-side with others who were similarly occupied than when working alone. Social loafing research dates back to Ringelmann's (1913; see Kravitz & Martin, 1986) experiment with rope pulling; students working together pulled a rope with less force than was expected on the basis of their performance when working individually. These experiments represent two of the first social psychological studies of group performance. However, in one (Triplett, 1898) working together led to better performance than when working alone, whereas in the other (Ringelmann, 1913) working together led to worse performance than when working alone. Given their long histories, it is surprising that until recently nothing had been made of the apparently contradictory nature of the findings of these two research paradigms.

In the present research, an expectancy-based model of social facilitation and social loafing is presented and tested. Many psychological theories propose that people are motivated by their expectations about what they can do as well as by their expectations about the likely consequences of their actions. Self-efficacy theory (Bandura, 1977, 1986, 1989), for example, maintains that a person's motivation is determined by two related expectancies: an *efficacy expectancy,* the belief by a person that he or she is capable of performing the requisite behavior; and an *outcome expectancy,* the belief by a person that a given behavior or set of behaviors will lead to a given outcome. Bandura's (1978) example of a high jumper illustrates the distinction: "The expectation that one can jump 6 feet is an efficacy judgement; the social recognition, applause, trophies and self-satisfactions anticipated for such a performance constitute outcome judgements" (p. 240). Self-efficacy theory has been shown to predict behavior well in numerous contexts (e.g., see Bandura, 1986; and Maddux & Stanley, 1986, for reviews). It is argued not only that applying self-efficacy theory can further an understanding of social facilitation and social loafing but that applying the theory to group performance may lead to a greater refinement of self-efficacy theory as well.

Social Facilitation and Social Loafing

Contemporary interest in social facilitation began with Zajonc's (1965) drive-based explanation of the phenomenon. He proposed that the presence of others, as an audience or as coactors, arouses a performer's generalized drive, which increases the emission of dominant responses. When the dominant responses are correct, as on simple or well-learned tasks, performance would be improved in the presence of others, as in Triplett's (1898) study. However, when the dominant responses are incorrect, as on difficult or not well-learned tasks, performance would be impaired in the presence of others. Zajonc's integration renewed interest in the area of social facilitation, as it made sense of a number of apparently contradictory findings.

But what of Ringelmann's (1913) findings? Ringelmann's students also worked together on a task that was quite simple, but there was no social facilitation. Harkins (1987; see also Harkins & Szymanski, 1987) has argued that nothing had been made of these apparent contradictions because, by the time of Zajonc's (1965) review, these two topics had already been viewed as be-

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longing to separate research areas. That is, in Triplett's (1898) research, children worked individually, side-by-side, and on the same task, placing it within the coaction literature. In contrast, Ringelmann's students pulled on the same rope. As Steiner (1972) had argued, coordination losses could account for Ringelmann's results, placing it within the group process literature. Having been consigned to separate areas, the discrepant findings of these two research paradigms were apparently easy to ignore.

However, coordination losses alone have been shown to be insufficient to account for Ringelmann's (1913) findings and therefore cannot account for the presumed differences between social facilitation and social loafing. For example, after replicating Ringelmann's rope-pulling experiment, Ingham, Levinger, Graves, and Peckham (1974) conducted a second experiment in which participants were led, on certain trials, to believe that they were pulling with others, when in fact they were pulling alone. These pseudogroup trials provided no opportunities for coordination losses; however, participants still put forth less effort than when working alone. Social loafing has since been demonstrated on a variety of tasks that require physical effort (e.g., pumping air [Kerr & Bruun, 1981]; clapping and shouting [Latané, Williams, & Harkins, 1979]; and folding paper [Zaccaro, 1984]) and cognitive effort (e.g., reacting to proposals [Brickner, Harkins, & Ostrom, 1986]; brainstorming and vigilance [Harkins & Petty, 1982]; solving mazes [Jackson & Williams, 1985]; and evaluating essays [Petty, Harkins, & Williams, 1980]).

Williams, Harkins, and Latané (1981; see also Kerr & Bruun, 1981) have shown that when participants were led to believe that their outputs could be individually identified, social loafing was eliminated. However, Harkins and Jackson (1985) have shown that the identifiability of individual performance alone is insufficient to eliminate social loafing. Social loafing was eliminated only when outputs were identifiable and when participants believed they were performing the same task, because it was only then that participants thought they could be evaluated through comparison of their performances with that of co-workers. Consistent with this reasoning, additional research has indicated that participants in social loafing studies are motivated by the potential for evaluation (Harkins, 1987; Harkins & Szymanski, 1988; Harkins & Szymanski, 1989; Szymanski & Harkins, 1987).

The emphasis on the potential for evaluation as one important determinant of social loafing has important implications for integrations with the area of social facilitation. Jackson and Williams (1985) and Harkins (1987) have provided empirical support for the proposal that social facilitation and social loafing can be accommodated within the same experimental design. For example, Jackson and Williams (1985) used three group conditions (alone, coaction, and collective) in which participants performed easy and difficult mazes. Coaction participants performed better on simple mazes and worse on complex mazes than did alone participants, reflecting a social facilitation effect. Moreover, collective participants performed worse on the simple mazes than did coaction participants, reflecting a social loafing effect; when the mazes were complex, collective participants performed better than coaction participants.

Self-Efficacy Theory and Social Performance

This line of research therefore suggests that social facilitation and social loafing can be accommodated within the same experimental design. In the present article, it is proposed that self-efficacy theory (e.g., Bandura, 1977, 1986, 1989) may provide a useful theoretical framework in which to conceptualize these results. The following analysis focuses on a participant's efficacy expectancies and outcome expectancies.

Efficacy Expectancy

A variety of theoretical explanations have been invoked to account for social facilitation effects (e.g., see Geen, 1989, for a review). Although these traditional views of social facilitation focused on task difficulty (i.e., easy vs. difficult) as a key moderating variable, some recent research suggests that task difficulty may affect performance through a participant's efficacy expectations. For example, Geen (1979) has shown that participants given preliminary failure feedback performed worse on a complex paired-associates list when in the presence of an experimenter than when alone. However, if participants were given preliminary success feedback, they performed the complex list better in the presence of an experimenter than when alone, a finding not predicted by drive theory (cf. Geen, 1981; Good, 1973; Seta & Hassan, 1980). Extending this line of reasoning, Sanna and Shotland (1990) asked participants to perform a series of rote memorization tasks. On a preliminary task, participants were given feedback that indicated that they had performed either successfully or unsuccessfully. After the prior success, participants expected to perform well, and they performed better in the presence of an audience than when alone. However, after the prior failure, participants expected to perform poorly, and they performed worse in the presence of an audience than when alone (see also Robinson-Staveley & Cooper, 1990).

Additional evidence comes from theorists (e.g., Bond, 1982; Carver & Scheier, 1981) who have argued that a participant performing a simple task will develop an expectation of a successful performance, resulting in improved social performance. In contrast, a participant performing a complex task will develop an expectation of a poor performance, resulting in impaired social performance. For example, Bond used two types of paired-associates lists: a list made up of mostly simple items and a few complex items, and a list made up of mostly complex items and a few simple items. When performing the list with mostly simple items and a few complex items, participants inferred that they were doing well, and audience presence did not affect performance on complex items. However, when the list consisted of mostly complex items, participants inferred that they were doing poorly, resulting in impaired social performance, even on the simple items inserted among the complex items.

Consistent with these proposals, in social loafing research, on simple tasks such as rope pulling (Ingham et al., 1974), clapping and shouting (Latané et al., 1979), pumping air (Kerr & Bruun, 1981), and folding paper (Zaccaro, 1984), evaluation has been shown to lead to improved performance. When complex tasks were used (Jackson & Williams, 1985), evaluation has

been shown to lead to impaired performance. Thus, whether participants were first provided with false performance feedback (e.g., Geen, 1979) or whether task difficulty was varied (e.g., Jackson & Williams, 1985), changes in a participant's efficacy expectancies may have influenced social performance.

Outcome Expectancy

If a person believes that he or she is capable of the requisite performance, this does not mean that he or she can necessarily expect outcomes to result from the performance. As Bandura (1986) proposes, "outcome expectations can be dissociated from self-efficacy judgements when either no action can produce a selected effect or when extrinsic outcomes are loosely linked to level or quality of performance" (p. 393). Consider the social facilitation alone condition in which participants cannot be evaluated (e.g., Schmitt, Gilovich, Goore, & Joseph, 1986) or the typical social loafing collective condition (e.g., Harkins & Jackson, 1985). What type of social recognition can a participant expect from the experimenter when he or she cannot be individually identified and evaluated? Likely, not much. In fact, as Latané et al. (1979) have observed, participants loaf because they believe that "they can receive neither precise credit nor appropriate blame for their performance" (p. 830). The expected evaluation (or lack thereof) from the experimenter can be regarded as an outcome expectancy. Thus, for a person in the prototypic collective condition, there is a loose performance–outcome contingency at best (Latané et al., 1979). In contrast, in the evaluation conditions of social facilitation and social loafing research, a high performance–outcome expectancy should result.

Interesting in this regard is that additional research has suggested that an *outcome value* construct may be usefully added to self-efficacy theory (e.g., Maddux, Norton, & Stoltenberg, 1986; Maddux & Stanley, 1986; Teasdale, 1978). For example, Bandura (1989) has observed that "in most social, intellectual, and physical pursuits, those who judge themselves highly efficacious will expect favorable outcomes, whereas those who expect poor performances of themselves will conjure up negative outcomes" (p. 25). Sanna and Shotland (1990) have shown that when participants expected to perform well, they expected a positive evaluation from an audience, and performance was improved relative to participants who worked alone. However, when participants expected to perform poorly, they expected a negative evaluation from an audience, and performance was impaired relative to participants who worked alone. This research suggests that high-efficacy expectancy, coupled with high-outcome expectancy, produces expectations of positive evaluation and improved social performance. In contrast, low-efficacy expectancy, coupled with high-outcome expectancy, produces expectations of negative evaluation and impaired social performance. The present article reports the results from a pair of experiments that were designed to examine these possibilities.

Experiment 1

To test the applicability of self-efficacy theory to social facilitation and social loafing, participants' efficacy expectancies and outcome expectancies were manipulated. In Experiment 1, this was done by varying two levels of efficacy expectancy and three levels of outcome expectancy in a 2 (efficacy expectancy) × 3 (outcome expectancy) between-subjects factorial design. A vigilance task was used, in which participants were asked to detect as many signals as they could while minimizing false alarms (e.g., Harkins, 1987; Harkins & Szymanski, 1988). Efficacy expectancies (high vs. low) were manipulated by providing false performance feedback after participants worked on a preliminary task. Outcome expectancies were manipulated by having participants perform alone (low-outcome expectancy), in coacting pairs in which performances could be individually evaluated (high-outcome expectancy), or in collective pairs in which performances were pooled and could not be individually evaluated (low-outcome expectancy).

It was predicted that, in the high-efficacy condition, coaction participants would perform better than alone participants, whereas in the low-efficacy condition, coaction participants would perform worse than alone participants. These findings would be consistent with the results of social facilitation research. In addition, it was predicted that, in the high-efficacy condition, collective participants would perform worse than coaction participants, whereas in the low-efficacy condition, collective participants would perform better than coaction participants. These findings would be consistent with the results of social loafing research. Moreover, high-efficacy coaction participants should expect a positive evaluation, whereas low-efficacy coaction participants should expect a negative evaluation.

Method

Participants

Participants were 144 introductory psychology students who received extra course credit. Twelve pairs in each of the coaction and collective conditions and 24 individuals in each of the alone conditions were randomly assigned to the six cells of the design.

Procedure

Participants arrived individually or in pairs and were seated at a table on which there were two personal computers and a partition that prevented pairs from seeing one another. There was a third, larger computer (without a monitor or keyboard) that was positioned on a box near the floor. A set of wires ran under the table, connecting the three computers. Participants were asked to read the following instructions that were presented on their computer monitor:

> We are interested in studying the performance of people on a task that we are developing called the vigilance task. The vigilance task requires you to watch for dots to flash on the computer screen. When you see a dot, you are to respond by pressing the RED key on the center of the keyboard. A dot may flash any number of times and in any location since the number and position of the dots are determined randomly by the computer. In this experiment, you will be asked to perform a series of three vigilance tasks (one 4 minute practice trial and two 9 minute experimental trials), and to answer some questions concerning your perceptions of the tasks and of your performance. Please try to detect

as many signals as you can while minimizing the number of times that you falsely report a signal.

Vigilance tasks. The vigilance tasks were similar to others used in social loafing research (e.g., Harkins, 1987; Harkins & Szymanski, 1988). During the 4-min vigilance practice trial, 6 dots were presented. During each of the 9-min vigilance experimental trials, 11 dots were presented. Each signal was a 1 mm square that was flashed for 0.05 s on a 27.94 cm computer monitor at a randomly predetermined location. However, across the three trials no dots appeared in exactly the same location, and no time intervals between flashes were exactly the same. Participants responded by pressing the *h* key on the center of the computer keyboard, which was marked with red tape. The three vigilance trials were the same for all participants.

Efficacy expectancy. Participants were told that, to familiarize them with the experimental procedure, they would first perform a 4-min vigilance trial that had been used in previous research. Before beginning the 4-min trial, the experimenter answered any questions and then left the room. After completing the trial, participants read the following:

> This completes the 4 minute vigilance practice trial. Because this 4 minute vigilance trial has been used in previous research, there are norms that indicate how well you performed relative to other people who have performed this task. These norms have been entered into the computer. To calculate how well you did, in terms of percentile ranking, press the spacebar. Your percentile ranking depends both on the number of dots that were presented to you and on the number of dots that you correctly detected. Your performance on the 4 minute vigilance practice trial should give you a general indication of how well you will perform on the two 9 minute vigilance trials.

When the spacebar was pressed, there was a 8.6 s interval in which the screen flashed "CALCULATING . . . Please Wait." After this time, the drive-light flashed on, and, as if it were being typed out by the computer, the following false performance feedback was presented. In the *high-efficacy* condition, participants read "You scored in the upper 80th percentile on established norms for this task. The 80th percentile is the highest possible performance ranking for the 4 minute vigilance task." In the *low-efficacy* condition, participants read "You scored in the lower 20th percentile on established norms for this task. The 20th percentile is the lowest possible performance ranking for the 4 minute vigilance task."

Outcome expectancy. The computer then instructed participants that, having had some practice, they were ready to begin the two 9-min vigilance trials. Consistent with the cover story, the participants were also told that during this time they would be asked to answer some questions that would help the researchers in their further development of the vigilance tasks. Participants then read the following:

> Previous researchers have used only the 4 minute vigilance trial (like the one that you just participated in for practice) to assess people's vigilance performance. However, in our experiment we are testing to see what happens when people are asked to perform the vigilance trials for longer time intervals. Therefore, we have extended the vigilance trials to 9 minutes each. Although norms exist for performance on the 4 minute vigilance trial, we do not have any norms for performance on the 9 minute trials since this task is still under development. We therefore cannot provide you with feedback on how you did relative to norms. However, try your best to detect as many signals as you can while minimizing the number of times that you falsely report a signal.

Coupled with the opening instructions indicating that the number and position of the dots would be determined randomly by the computer, *alone* participants then read the following:

> The computer will record the number of times that you correctly report the presence of a dot so that the experimenter can look at the number of dots that you detected after you are finished.

Participants in the *coaction* condition read the following:

> The computer will record the number of times that each of you correctly report the presence of a dot. Since each of you will be presented with the same number of dots, the experimenter can look at the number of dots that each of you detected individually after you are finished.

In the *collective* condition, participants read the following:

> The computer will combine the number of times that both of you correctly report the presence of a dot. Since both of you will be presented with the same number of dots, the experimenter can look only at the total number of dots that both of you detected as a group after you are finished.

At this point, participants were instructed to stop and wait quietly for the experimenter. The experimenter reentered the room, turned on the third computer, and told participants that, because of limited computer memory, their performance on the two 9-min vigilance trials would be recorded by the third larger computer; the experimenter reemphasized the alone, coaction, and collective manipulations. After answering any questions, the experimenter initiated the remainder of the experiment and left the room.

Before continuing, participants were asked a series of questions that contained manipulation checks relating to performance on the 9-min vigilance trials. They were asked to rate the extent to which they believed they would be able to correctly detect the dots, the extent to which they believed the experimenter would be able to determine exactly how many dots they individually detected, the extent to which they believed the experimenter would be able to directly compare their individual performance with the performances of others, the extent to which they believed their performance would be evaluated positively by the experimenter, and the extent to which they believed their performance would be evaluated negatively by the experimenter. Each of these questions was accompanied by an 11-point scale anchored by *not at all* (0) and *very much* (10). The questions were presented, and participants responded to them, by computer. After completing the two 9-min vigilance trials, participants were again asked to answer this set of questions.

Results

The data from pairs in the coaction and collective conditions were averaged, resulting in 12 observations per cell (see, e.g., Harkins, 1987). In the alone conditions, data were averaged in pairs according to order of participation, also resulting in 12 observations per cell.

Manipulation Checks

Manipulation checks were analyzed using 2 (efficacy expectancy) × 3 (outcome expectancy) analyses of variance (ANOVAs). The manipulation checks represent the average of participants' ratings of these variables as measured before and after the two 9-min vigilance trials.[1] Where appropriate, Newman-Keuls tests were used to compare means.

[1] Repeated measures ANOVAs, using the manipulation checks before and after the two 9-min vigilance trials as repeated measures factors, revealed no repeated measures effects. Repeated measures ANOVAs on the two measures of anticipated positive evaluation and on the two measures of anticipated negative evaluation similarly revealed no repeated measures effects.

Identifiability. There was a main effect of outcome expectancy on the measure of identifiability, $F(2, 66) = 51.76$, $p < .001$. Participants in the collective condition believed that the experimenter would be less able to determine exactly how many dots they individually detected on the 9-min vigilance trials ($M = 4.47$) than did participants in the alone ($M = 8.11$) and coaction ($M = 8.06$) conditions (both $ps < .01$), whereas the latter two means did not differ significantly ($p > .20$). No other effects were significant.

Comparability. On the comparability measure, there was an outcome expectancy main effect, $F(2, 66) = 24.45$, $p < .001$. Coaction participants ($M = 7.75$) believed that the experimenter could directly compare their individual performance on the 9-min vigilance trials with the performances of others to a greater extent than did alone ($M = 4.46$) and collective ($M = 4.26$) participants (both $ps < .01$); alone and collective participants did not differ significantly ($p > .20$). No other effects were found.

Self-efficacy expectancy. There was a main effect of the efficacy manipulation on the extent to which participants believed that they would be able to correctly detect the dots on the 9-min vigilance trials, $F(1, 66) = 39.83$, $p < .001$. The high-efficacy manipulation produced stronger self-efficacy expectancies ($M = 6.37$) than did the low-efficacy manipulation ($M = 4.46$). No other significant main effects or interactions were revealed.

Valence of anticipated evaluation. To analyze this measure, a composite *social value* index was constructed by subtracting participants' ratings of the extent to which they believed that their performance would be evaluated negatively by the experimenter from their ratings of the extent to which they believed that their performance would be evaluated positively by the experimenter (Sanna & Shotland, 1990). Scored in this manner, an estimate of participants' anticipated evaluation on the 9-min vigilance trials was obtained with the associated signs indicating the direction of evaluative valence.

Analysis of social value scores revealed a main effect of efficacy expectancy, $F(1, 66) = 27.78$, $p < .001$, which occurred in the context of an Efficacy Expectancy × Outcome Expectancy interaction, $F(2, 66) = 10.44$, $p < .001$. As predicted, in the high-efficacy condition, coaction participants expected a greater positive evaluation from the experimenter ($M = 4.17$) than did alone ($M = 0.96$) and collective ($M = 0.73$) participants (both $ps < .01$). In contrast, in the low-efficacy condition, coaction participants expected a greater negative evaluation from the experimenter ($M = -3.90$) than did alone ($M = -0.66$) and collective ($M = -0.46$) participants (both $ps < .01$). All alone and collective means did not significantly differ from each other.[2]

Vigilance Errors

Consistent with previous research using a vigilance task (e.g., Harkins, 1987; Harkins & Szymanski, 1988), the two possible types of vigilance errors (misses and false alarms) were positively related. For this reason, the two types of errors were added for analysis.

To assess the effects of experimental treatments on errors, a 2 (efficacy expectancy) × 3 (outcome expectancy) analysis of covariance (ANCOVA) was conducted with participants' practice task errors used as a covariate. The dependent measure represents the mean number of errors made on the two 9-min vigilance trials.[3]

The performance results are presented in Figure 1. The figure represents vigilance errors, so fewer errors indicate better performance. There was a main effect of efficacy expectancy, $F(1, 66) = 57.69$, $p < .001$, with fewer errors made by high- ($M = 2.62$) than low-efficacy ($M = 4.43$) participants. However, this effect must be interpreted in the context of an Efficacy Expectancy × Outcome Expectancy interaction, $F(2, 66) = 18.37$, $p < .001$. As predicted, and as Figure 1 illustrates, in the high-efficacy condition, coaction participants made fewer errors ($M = 1.48$) than did alone ($M = 3.16$) and collective ($M = 3.25$) participants (both $ps < .01$), whereas alone and collective means did not differ ($p > .20$). In contrast, also as predicted, in the low-efficacy condition, coaction participants made more errors ($M = 5.29$) than did alone ($M = 4.04$) and collective ($M = 3.95$) participants (both $ps < .01$), whereas alone and collective means did not differ ($p > .20$).

Path Analysis

The role of self-efficacy expectancy and valence of anticipated evaluation as mediators of performance were examined directly using multiple regression techniques. According to Judd and Kenny (1981), three requirements must be met to demonstrate mediation. First, the independent variables must affect the outcome (vigilance errors). Second, the independent variables must affect the proposed mediators (self-efficacy expectancy and valence of anticipated evaluation). Third, the proposed mediators must affect the outcome when the effects of the independent variables are controlled.

To test for mediation in the present data, the independent variables were contrast coded (e.g., *high efficacy* = 1, *low efficacy* = −1). The analyses were conducted using the self-efficacy expectancy and valence of anticipated evaluation manipulation checks as measured *before* performance. The standardized path coefficients are depicted in Figure 2.

As anticipated by the ANOVAs reported previously, a model including only the independent variables was significant ($R^2 =$

[2] An ANOVA on the measure of anticipated positive evaluation revealed a main effect of efficacy expectancy, $F(1, 66) = 15.44$, $p < .001$, and an Efficacy Expectancy × Outcome Expectancy interaction, $F(2, 66) = 7.77$, $p < .001$. In the high-efficacy condition, coaction participants expected a greater positive evaluation ($M = 5.58$) than did alone ($M = 3.04$) and collective ($M = 3.19$) participants (both $ps < .01$), whereas within the low-efficacy condition means did not differ from each other (alone, $M = 2.38$; coaction, $M = 1.45$; collective, $M = 2.85$). An ANOVA on the measure of anticipated negative evaluation revealed a main effect of efficacy expectancy, $F(1, 66) = 15.66$, $p < .001$, and an Efficacy Expectancy × Outcome Expectancy interaction, $F(2, 66) = 4.36$, $p < .02$. In the low-efficacy condition, coaction participants expected a greater negative evaluation ($M = 5.35$) than did alone ($M = 3.04$) and collective ($M = 3.31$) participants (both $ps < .02$), whereas within the high-efficacy condition means did not differ (alone, $M = 2.08$; coaction, $M = 1.41$; collective, $M = 2.46$)

[3] A repeated measures ANOVA, using errors on the two 9-min vigilance trials as a repeated measures factor, revealed no repeated measures effects.

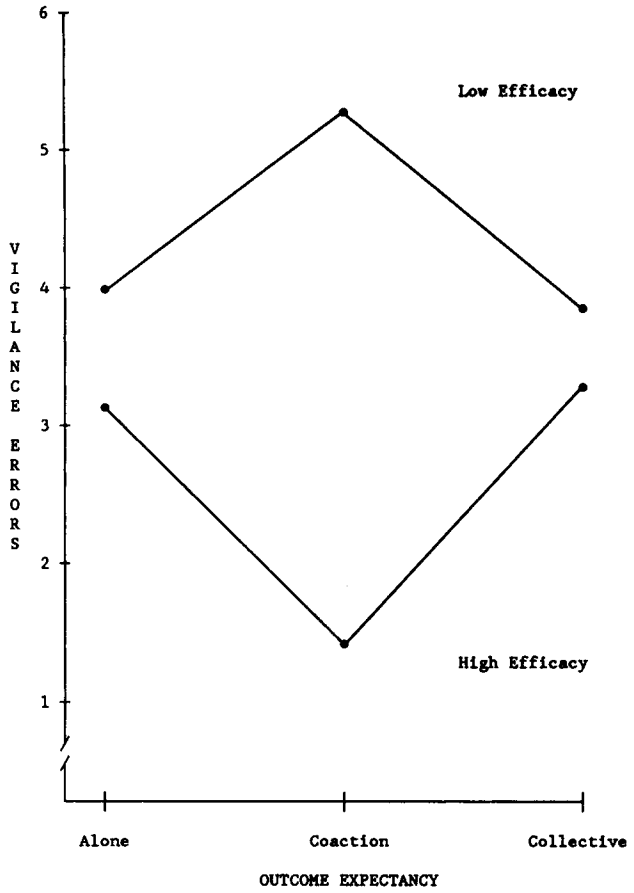

Figure 1. Performance results of Experiment 1.

.528), $F(3, 68) = 25.36$, $p < .001$. Regressions of self-efficacy expectancy ($R^2 = .444$), $F(3, 68) = 18.12$, $p < .001$; and valence of evaluation ($R^2 = .338$), $F(3, 68) = 11.58$, $p < .001$; on the independent variables were also significant. Providing evidence for mediation, significant paths from self-efficacy expectancy (−.335) and valence of evaluation (−.307) to vigilance errors were obtained. As predicted, vigilance errors decreased as self-efficacy increased and valence of evaluation became more positive. There were also significant direct paths from manipulated efficacy and Efficacy × Outcome to vigilance errors. The regression model for vigilance errors, displayed in Figure 2, was significant ($R^2 = .658$), $F(5, 66) = 25.39$, $p < .001$; and accounted for significantly more variance in vigilance errors than when self-efficacy expectancy and valence of evaluation were omitted ($\Delta R^2 = .130$), $F(2, 66) = 12.53$, $p < .001$.[4]

Discussion

The results of Experiment 1 provide support for the proposal that social facilitation and social loafing may be conceptualized in terms of self-efficacy theory. Efficacy expectancy and outcome expectancy jointly affected performance on a vigilance task. On a preliminary task, feedback indicated to participants that they had successfully or unsuccessfully performed, and this induced high and low self-efficacy expectancies, respectively. In addition, outcome expectancies were manipulated by using three group conditions: alone, coaction, and collective. Although coaction participants who worked on identical tasks believed that they could be individually evaluated by the experimenter (high-outcome expectancy), participants who worked alone and collectively believed that they could be individually evaluated by the experimenter to a lesser extent (both low-outcome expectancy). Path analysis provided support for the mediational role of self-efficacy expectancies and valence of evaluation, although significant direct paths from the independent variables also remained.

The finding that a measure of output (e.g., number of errors made) and a standard of comparison (e.g., number of errors made by others) is necessary for evaluation is consistent with prior research (e.g., Harkins, 1987). In the coaction condition, the number of errors made by each participant could be identified, and because both participants were presented with the same number of dots, each participant's performance could be compared by the experimenter to the performance of a coworker. In the collective condition, participants' performances were pooled, and neither the number of errors made nor a standard of comparison (because there were no norms for the 9-min trials) would be available to the experimenter. In the alone condition, although participants believed they were individually identifiable, they did not believe that their performance could be compared to a standard because, as the instructions stated, the number of dots presented during a trial was determined randomly by the computer.

Experiment 2

In Experiment 1, efficacy expectancies were manipulated by providing false performance feedback, and outcome expectancies were manipulated by three group conditions. However, in social facilitation research, participants are usually asked to perform easy or difficult tasks. Therefore, a question to be addressed is whether self-efficacy expectations would develop spontaneously when task difficulty was varied. In Experiment 2, this was explicitly tested using the easy and difficult versions of the Remote Associates Test (RAT; e.g., McFarlin & Blascovich, 1984). High-efficacy expectancies were predicted to develop when performing the easy list, whereas low-efficacy expectancies were predicted to develop when performing the difficult list. Outcome expectancies were manipulated using three levels of evaluation: alone (low-outcome expectancy), pairs working on same tasks who could be evaluated (high-outcome expectancy), and pairs working on different tasks who could not be evaluated (low-outcome expectancy). These factors were varied in a 2 (efficacy expectancy) × 3 (outcome expectancy)

[4] The pattern and magnitude of the significant paths using the self-efficacy and valence of evaluation manipulation checks as measured *after* performance were virtually identical to those presented in Figure 2. Again, the regression model for vigilance errors was significant ($R^2 = .635$), $F(5, 66) = 22.97$, $p < .001$, and accounted for significantly more variance in vigilance errors than when self-efficacy expectancy and valence of evaluation were omitted ($\Delta R^2 = .107$), $F(2, 66) = 9.67$, $p < .001$.

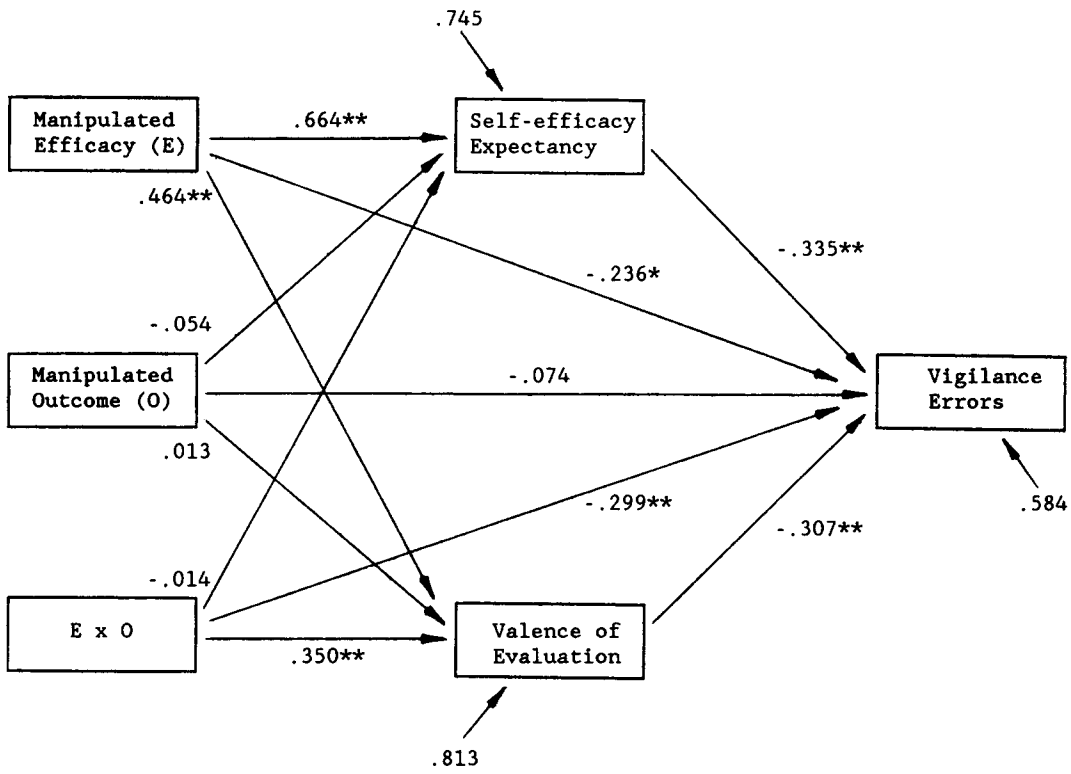

Figure 2. Path analysis for Experiment 1. (Standardized path coefficients are presented; $^{*}p < .05$. $^{**}p < .01$.)

between-subjects factorial design. The same versus different task manipulation of evaluation has been used recently in social loafing research (e.g., Harkins, 1987; Harkins & Jackson, 1985), but it also has had a long history in social facilitation research (e.g., Seta, Paulus, & Risner, 1977).

It was predicted that, in the easy-list condition, evaluation participants would perform better than alone participants, whereas in the difficult-list condition, evaluation participants would perform worse than alone participants. These findings would be consistent with the results of social facilitation research. In addition, it was predicted that, in the easy-list condition, no-evaluation participants would perform worse than evaluation participants, whereas in the difficult-list condition, no-evaluation participants would perform better than evaluation participants. These findings would be consistent with the results of social loafing research. Furthermore, easy-list evaluation participants should expect a positive evaluation, whereas difficult-list evaluation participants should expect a negative evaluation. If self-efficacy expectancies can be shown to develop spontaneously while participants work on easy or difficult tasks, then a stronger case could be made for the generality and applicability of self-efficacy theory to social facilitation and social loafing phenomena.

Method

Participants

Participants were 144 introductory psychology students who received extra course credit. Twelve pairs were randomly assigned to each of the evaluation and no-evaluation conditions and 24 individuals were randomly assigned to each of the alone conditions.

Procedure

On arrival, individuals or pairs were seated at a table on which there were two personal computers and a partition that prevented pairs from seeing one another. Participants were asked to read the following instructions that were presented on their computer monitor:

> We are interested in studying the performance of people on a task that we are developing called the Remote Associates Test (RAT). Each RAT item consists of three stimulus words that are somehow related to a fourth word that you are to determine and record. For example, an item might consist of the three stimulus words: "elephant," "lapse," and "vivid." A correct response would be the fourth word "memory." We are interested in the responses that people give to a wide variety of RAT items. You will be asked to perform only a small subset of these items. Since some of the items are easy and some are difficult, the number of items that you get correct would be comparable to the number of items that another person gets correct only when you are working on the same series of items. If you are not working on the same series of items, then your performance cannot be compared to the performances of anyone else.

Outcome expectancy. For *alone* and *no-evaluation* participants, the instructions continued as follows: "In this experiment, we are interested in the number of correct responses for a wide variety of items, and so, you alone will be performing this particular series of items." Participants in the *evaluation* condition read the following: "In this experiment, we are interested in the number of correct responses for

one particular series of items, and so, each of you will be performing the same series of items."

Efficacy expectancy. Efficacy expectancy was manipulated by requiring participants to perform either the easy (*high efficacy*) or difficult (*low efficacy*) version of the RAT. Each RAT item consisted of 3 stimulus words that were related to a 4th unreported word that participants were to determine and record. As determined by previous research (e.g., McFarlin & Blascovich, 1984), the easy list was composed of 10 easy items (e.g., stimulus: "Athletes-Web-Rabbit"; response: "foot"), and the difficult list was composed of 10 difficult items (e.g., stimulus: "Desert-Ice-Spell"; response: "dry"). The stimulus words were each presented serially on a computer screen for 1 min. During each 1-min interval, participants recorded the 4th word on an answer sheet that was provided. If participants could not think of an answer, they were instructed to write an *X* in the space that was provided for that item. The triads of stimulus words within each of the lists were presented in random order.

All of the participants first took part in a 1-min practice trial, during which one RAT item was presented.[5] At the end of the practice trial, the experimenter answered any questions and then left the room. No performance feedback was given for the practice trial. Participants then worked on either the easy or difficult RAT list under the various conditions. Of course, under no-evaluation instructions, pairs actually performed the same tasks (i.e., both participants performed either the easy or the difficult list depending on condition).

After completing the list, participants were asked a series of questions, embedded among filler items, that were designed to assess the success of the manipulations. The questions were presented in random order, and participants responded by computer. They were asked two questions concerning the extent to which they thought the items were easy and difficult to solve, two questions concerning the extent to which they believed the experimenter could determine exactly how many responses they wrote down, two questions conerning the extent to which they believed the experimenter could directly compare their individual performance with the performances of others, two questions concerning the extent to which they believed they could successfully solve and correctly answer the items, two questions concerning the extent to which they believed the experimenter would evaluate their performance, and two questions concerning the extent to which they believed their performance would be positively and negatively evaluated by the experimenter. Each of the rating scales that accompanied the questions were anchored by *not at all* (0) and *very much* (10).

Results

The data from pairs in the evaluation and no-evaluation conditions were averaged, resulting in 12 observations per cell (see, e.g., Harkins, 1987). In the alone conditions, the data were averaged in pairs according to order of participation, also resulting in 12 observations per cell. The data were analyzed by a series of 2 (efficacy expectancy) × 3 (outcome expectancy) ANOVAs. Newman-Keuls tests were used for mean comparisons where appropriate.

Manipulation Checks

Task difficulty. The task difficulty measure consisted of an average of two items concerning the extent to which participants thought that the RAT items were easy and difficult (reverse-scored) to solve, $r(70) = .63$, $p < .001$. There was a main effect of efficacy expectancy, $F(1, 66) = 63.06$, $p < .001$. No other effects were significant. Consistent with previous research using these lists (e.g., McFarlin & Blascovich, 1984), participants thought that the easy list ($M = 6.04$) was easier to solve than the difficult list ($M = 3.43$).

Identifiability. Two items assessed the extent to which participants believed that the experimenter could determine exactly how many responses to the RAT items they wrote down, $r(70) = .61$, $p < .001$. In all conditions, the experimenter could readily determine how many items participants wrote down by observing their answer sheets. Therefore, all participants should have felt equally identifiable, and they did (Fs < 1; overall, $M = 8.39$).

Comparability. Participants were asked two questions concerning the extent to which they believed that the experimenter could directly compare their individual performance on the RAT items with the performances of others, $r(70) = .72$, $p < .001$. There was a main effect of outcome expectancy, $F(2, 66) = 16.26$, $p < .001$. Evaluation participants felt that their performances could be compared ($M = 7.04$) to a greater extent than did alone ($M = 4.77$) and no-evaluation ($M = 4.88$) participants (both ps < .01); the latter two conditions did not differ ($p > .20$). There were no other significant effects.

Self-efficacy expectancy. The self-efficacy measure consisted of two questions concerning the extent to which participants believed they could successfully solve and correctly answer the RAT items, $r(70) = .73$, $p < .001$. There was a main effect of efficacy expectancy, $F(1, 66) = 42.24$, $p < .001$, with no other effects significant. As predicted, performing the easy list produced stronger self-efficacy expectancies ($M = 5.98$) than did performing the difficult list ($M = 4.04$).

Outcome expectancy. There was a main effect of outcome expectancy on the average of the two items, $r(70) = .84$, $p < .001$, that asked participants the extent to which they believed that the experimenter would evaluate their performance on the RAT items, $F(2, 66) = 21.76$, $p < .001$. Participants in the evaluation condition ($M = 7.72$) felt that they would be evaluated to a greater extent than did alone ($M = 4.48$) and no-evaluation ($M = 4.69$) participants (both ps < .01); the alone and no-evaluation means did not differ ($p > .20$). No other effects were found.

Valence of anticipated evaluation. A social value index was constructed by subtracting participants' ratings of the extent to which they believed that their performance would be evaluated negatively by the experimenter from their ratings of the extent to which they believed that their performance would be evaluated positively by the experimenter (Sanna & Shotland, 1990). Analysis of social value scores revealed a main effect of efficacy expectancy, $F(1, 66) = 33.95$, $p < .001$, which was explainable in the context of an Efficacy Expectancy × Outcome Expectancy interaction, $F(2, 66) = 13.63$, $p < .001$. As predicted, in the easy-list condition, evaluation participants expected a greater positive evaluation ($M = 4.54$) than did alone ($M = 0.04$) and no-evaluation ($M = 0.67$) participants (both ps < .01). In contrast, in the difficult-list condition, evaluation participants expected a greater negative evaluation ($M = -4.09$) than did alone ($M = -1.20$) and no-evaluation ($M = -0.87$) participants (both

[5] The RAT items used for the practice trial were taken from the "control" list (see McFarlin & Blascovich, 1984). Participants in the easy list condition were given the easy item: "Surprise-Line-Birthday"; response: "party." Participants in the difficult list condition were given the difficult item: "Bald-Screech-Emblem"; response: "eagle."

$ps < .01$). All alone and no-evaluation means did not significantly differ from each other.[6]

Items Correct

The performance results are presented in Figure 3. The figure represents the number of RAT items correct, so more items indicates better performance. Analysis of the number of RAT items answered correctly revealed a main effect of efficacy expectancy, $F(1, 66) = 92.97$, $p < .001$. As expected on the basis of previous research (e.g., McFarlin & Blascovich, 1984), more items were answered correctly when working on the easy ($M = 5.10$) than on the difficult ($M = 2.69$) lists. Of greater interest, however, was the Efficacy Expectancy × Outcome Expectancy interaction, $F(2, 66) = 18.46$, $p < .001$. As predicted, and as Figure 3 illustrates, in the easy-list condition, evaluation participants correctly answered more RAT items ($M = 6.17$) than did alone ($M = 4.29$) and no-evaluation ($M = 4.83$) participants (both $ps < .01$), whereas the means of alone and no-evaluation participants did not differ ($p > .20$). In contrast, also as predicted, in the difficult-list condition, evaluation participants correctly answered fewer RAT items ($M = 1.62$) than did alone ($M = 3.04$) and no-evaluation ($M = 3.41$) participants (both $ps < .01$), whereas the means of alone and no-evaluation participants did not differ ($p > .20$).

Path Analysis

Path analysis was conducted to examine the mediational role of self-efficacy expectancy, outcome expectancy, and valence of anticipated evaluation using the manipulation checks as described previously.[7] As with Experiment 1, the independent variables were contrast coded. The standardized path coefficients are depicted in Figure 4. As anticipated by the ANOVAs, a model including only the independent variables was significant ($R^2 = .618$), $F(3, 68) = 36.80$, $p < .001$; as were regressions of self-efficacy expectancy ($R^2 = .388$), $F(3, 68) = 14.37$, $p < .001$; outcome expectancy ($R^2 = .317$), $F(3, 68) = 10.52$, $p < .001$; and valence of evaluation ($R^2 = .438$), $F(3, 68) = 17.69$, $p < .001$, on the independent variables. Providing evidence for mediation, significant paths from self-efficacy expectancy (.290) and valence of evaluation (.383) to items correct were obtained. As predicted, items correct increased as self-efficacy increased and valence of evaluation became more positive. There were also significant direct paths from manipulated efficacy and Efficacy × Outcome to items correct. The regression model for items correct, displayed in Figure 4, was significant ($R^2 = .799$), $F(6, 65) = 43.09$, $p < .001$, and accounted for significantly more variance in items correct than when self-efficacy expectancy and valence of evaluation were omitted ($\Delta R^2 = .181$), $F(2, 65) = 29.04$, $p < .001$.

Discussion

The results of Experiment 2 replicate and extend the results of Experiment 1, providing further evidence in support of an application of self-efficacy theory to social facilitation and social loafing. As has been typically done in social facilitation research, participants in Experiment 2 were asked to perform either an easy or a difficult task. As predicted, participants who worked on the easy RAT list developed high self-efficacy expectancies, whereas participants who worked on the difficult RAT list developed low self-efficacy expectancies. In addition, outcome expectancies were manipulated by including three

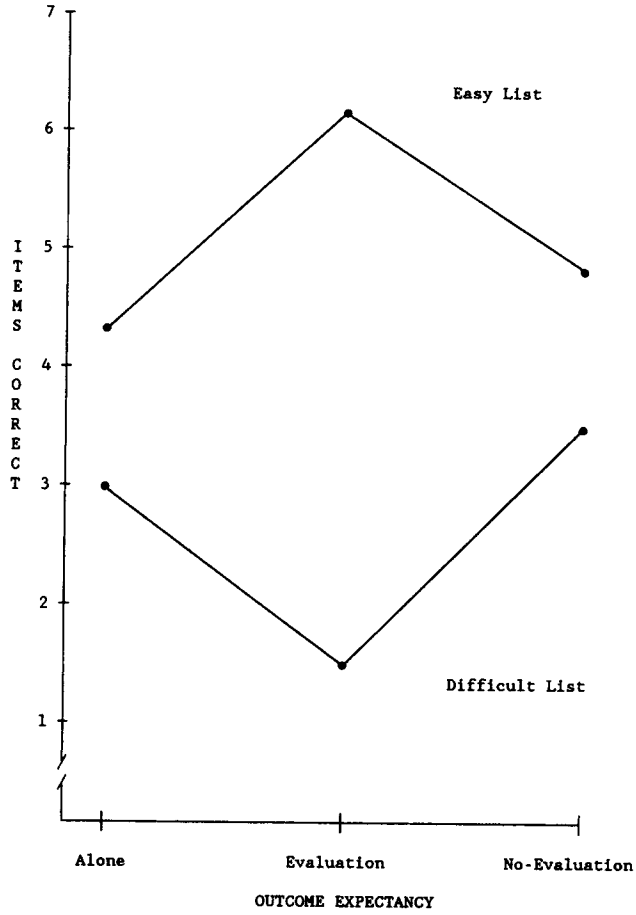

Figure 3. Performance results of Experiment 2.

[6] There was a main effect of efficacy expectancy on the measure of anticipated positive evaluation, $F(1, 66) = 17.16$, $p < .001$, which was due to an Efficacy Expectancy × Outcome Expectancy interaction, $F(2, 66) = 10.90$, $p < .001$. In the easy-list condition, evaluation participants ($M = 6.29$) expected a greater positive evaluation than did alone ($M = 3.21$) and no-evaluation ($M = 3.63$) participants (both $ps < .01$), whereas within the difficult-list condition means did not differ from each other (alone, $M = 3.04$; evaluation, $M = 1.83$; no-evaluation, $M = 3.09$). There was a main effect of efficacy expectancy on the measure of negative evaluation, $F(1, 66) = 26.30$, $p < .001$, explainable by an Efficacy Expectancy × Outcome Expectancy interaction, $F(2, 66) = 6.58$, $p < .001$. In the difficult-list condition, evaluation participants ($M = 5.92$) expected a greater negative evaluation than did alone ($M = 4.25$) and no-evaluation ($M = 3.96$) participants (both $ps < .03$), whereas within the easy-list condition means did not differ (alone, $M = 3.17$; evaluation, $M = 1.75$; no-evaluation, $M = 2.96$).

[7] A measure of outcome expectancy (expected evaluation), in the absence of evaluative valence, was not included in Experiment 1.

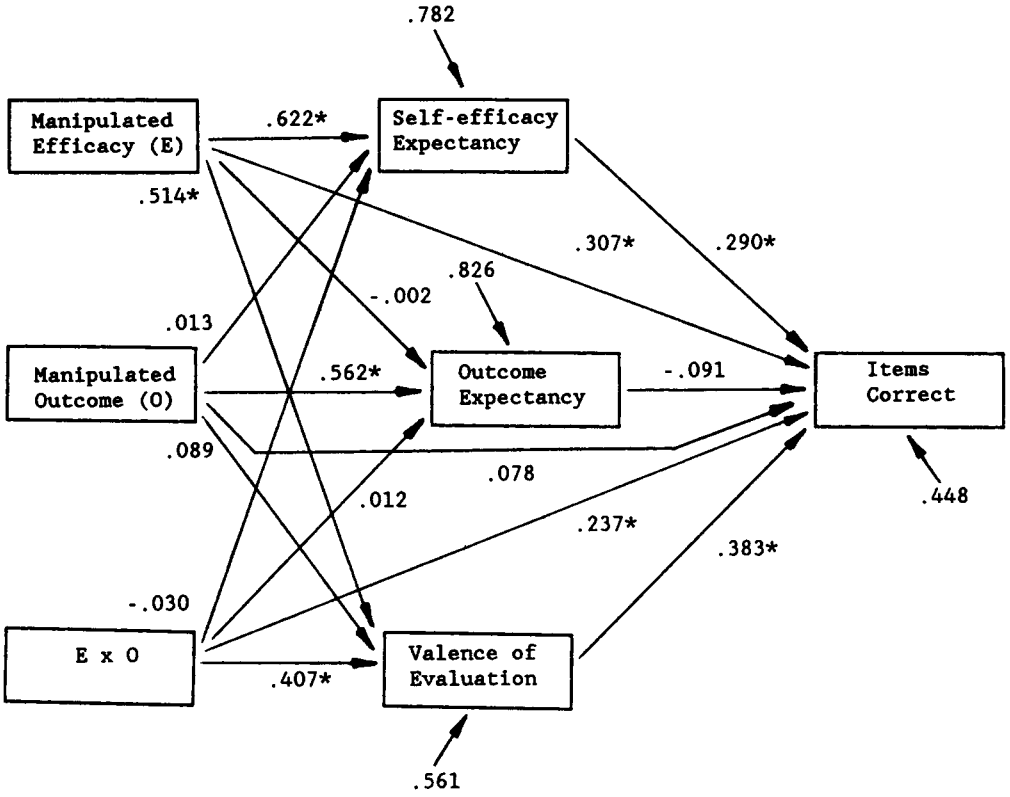

Figure 4. Path analysis for Experiment 2. (Standardized path coefficients are presented; $^*p < .01$.)

conditions in which participants worked alone, in pairs on identical tasks (evaluation), or in pairs on different tasks (no-evaluation). Although all participants felt equally identifiable, only in the evaluation condition did participants believe their performances could be compared and evaluated by the experimenter, a high-outcome expectancy. High-efficacy evaluation participants expected a positive evaluation, whereas low-efficacy evaluation participants expected a negative evaluation. Moreover, path analysis provided support for the mediational role of self-efficacy expectancies and valence of evaluation. The fact that performance differences were shown to result from self-efficacy expectancies that developed spontaneously as participants worked on easy or difficult tasks provides further support for the generality and applicability of self-efficacy theory to social facilitation and social loafing phenomena.[8]

General Discussion

The findings from these two experiments provide convergent evidence to support the proposal that social facilitation and social loafing can be conceptualized in terms of self-efficacy theory. In Experiment 1, as predicted, in the high-efficacy condition, coaction (high-outcome expectancy) participants performed better than alone and collective (both low-outcome expectancy) participants, whereas in the low-efficacy condition, coaction participants performed worse than alone and collective participants. In Experiment 2, high-efficacy expectancies were shown to develop when performing an easy task, whereas low-efficacy expectancies were shown to develop when performing a difficult task. As predicted, in the easy-list condition, evaluation (high-outcome expectancy) participants performed better than alone and no-evaluation (both low-outcome expectancy) participants, whereas in the difficult-list condition, evaluation participants performed worse than alone and no-evaluation participants. In both experiments, path analyses provided evidence for the mediating influence of self-efficacy expectancy and valence of evaluation on performance.

Positive Versus Negative Evaluation

The finding that differences in social performance appear to depend on whether the expected evaluation is positive or negative has interesting implications for theories of group performance. For example, although the issue of mere presence versus evaluation potential has not been resolved (cf. Guerin, 1986), and it is unlikely that all evaluative concerns can be eliminated in an experiment, in the present studies pairs who could not be individually evaluated performed at a level equivalent to alone participants within the high- and low-efficacy conditions. These findings are consistent with the results of Jackson and Williams (1985). Moreover, the valence of evalua-

[8] It is noteworthy that, in Experiment 2, expectancies were measured only after performance, discounting the possibility that the ratings themselves could have affected performance (see Sanna & Shotland, 1990, footnote 3).

tion expected by these participants was close to zero. It is possible that when a relatively neutral evaluation is expected, the presence of others will have little or no effect on performance (Sanna & Shotland, 1990). It is noteworthy that a focus on whether the expected evaluation is positive, negative, or neutral may help to illuminate the proportion of null results in these areas (e.g., Bond & Titus, 1983).

Sources of Comparison Standards

The notion that standards of comparison underlie evaluation is consistent with self-efficacy theory. For example, Bandura (1986) has proposed that *social standards,* or the performance level of those in one's immediate social environment, can serve as a referential comparison. In the present research, as in most previous social facilitation and social loafing research (e.g., Jackson & Williams, 1985; Latané et al., 1979), participants were evaluable only when their performances could be individually identified and compared with that of co-workers. In addition, *collective standards,* or a measure of one's personal accomplishment in comparison to the standard adopted by a group, can serve a motivational function (Bandura, 1986). Goethals and Darley (1987) have proposed a similar notion in their elaboration of social comparison theory (cf. Luthanen & Crocker, 1991; Tajfel & Turner, 1986). Research has shown that evaluation at the group level can eliminate social loafing (Harkins & Szymanski, 1989). Bandura (1986) also proposed that *normative standards* can serve as a comparison. These norms can be expressed in terms of such things as percentiles, departures from a mean, or the average performance of some representative sample. The average performance of participants in previous research (e.g., Szymanski & Harkins, 1987) corresponds most closely to the notion of normative standards. It is also possible that *personal standards* could motivate performance (Bandura, 1986). That is, the person could develop some notion of how the current level of performance compares with earlier levels. This possibility has yet to be explored directly by social facilitation and social loafing researchers. However, if a person has had extensive experience with a task, it is likely that such personal standards could motivate performance (see also Ruble & Frey, 1991).

Sources of Evaluation

In the present research, as in most previous social facilitation and social loafing research, the experimenter was the most salient source of evaluation. However, Szymanski and Harkins (1987) have argued that there are three potential sources of evaluation in social loafing research. That is, participants may loaf because they believe the experimenter cannot evaluate them, co-workers cannot evaluate them, or they cannot evaluate themselves. Social facilitation researchers have also referred to these three sources of evaluation (e.g., experimenter evaluation [Seta, Paulus, & Schkade, 1976], co-worker evaluation [Klinger, 1969], and self-evaluation [Sanders, Baron, & Moore, 1978]). Future research should determine whether the prospect of positive and negative self-evaluation (and co-worker evaluation) can motivate performance in a manner similar to the present findings with positive and negative experimenter evaluation.

Further implications of this line of reasoning concern the cognitive and behavioral strategies that people may use to maintain the prospect of positive evaluation or to avoid the prospect of negative evaluation. For example, Tesser (1988) has developed a model of self-evaluation that would suggest that people will engage in a number of social comparison strategies (e.g., downward comparisons) and social reflection strategies (e.g., basking) to maintain a sense of positive evaluation. Self-handicapping research (e.g., Higgins, Snyder, & Berglas, 1990) would suggest similar possibilities. That is, people may engage in strategies to discount ability as a cause of poor performance and to augment ability as a cause of good performance. Research addressing how such processes operate when people are faced with the prospect of positive or negative evaluation appears particularly intriguing.

Alternative Models of Social Performance

Self-efficacy theory appears to provide an integrative framework in which to conceptualize social facilitation and social loafing phenomena. However, this is not to suggest that self-efficacy expectancy and expected evaluation are the only, or even the primary, motivators of performance in these paradigms. There are likely other variables such as attributions, intrinsic motivation, goal setting, and so on, that are also important in this regard (e.g., see Bandura, 1986). In addition, social facilitation theorists have proposed a variety of possible variables (e.g., incentives, attention to the task, self-presentation concerns, etc.) that may serve as mediators of social performance (e.g., see Geen, 1989, for a review). For example, the significant direct paths from the independent variables to performance in the path analyses of the present studies might suggest that, at least as measured in these studies, self-efficacy expectancy and valence of evaluation may affect performance in conjunction with other mediational processes.[9]

Alternative theoretical perspectives can also be brought to bear on these issues. For example, Paulus (1983) has proposed a cognitive–motivational model in which effort, arousal, and task-irrelevant cognitions are assumed to mediate social performance. Mullen and Baumeister (1987) have proposed a model of social performance from a self-attention perspective. To address further the mediating and integrating role of self-efficacy theory in social facilitation and social loafing paradigms, one would also need to test for alternative mediators (given appropriate measures of the mediators). It is likely, of course, that there may be several mediational processes working in conjunction to produce social performance effects. If so, it may be that a model that contains mediators from self-efficacy theory as well as those from other theories would need to be developed. Future research would be effectively directed toward a comparison of the various theories and toward assessing how the various presumed mediators may function independently or in concert to motivate group performance.

[9] Of course, measurement error in the intervening variables could also alter the magnitude of the paths in the mediational models. The likely consequence of this in the present studies would be an overestimation of the magnitude of the paths from the independent variables to performance.

Efficacy Versus Outcome Expectancies

Finally, several studies have attempted to differentiate efficacy expectancies from outcome expectancies with varying degrees of success (e.g., Barling & Abel, 1983; Jacobs, Prentice-Dunn, & Rogers, 1984; Maddux, Norton, & Leary, 1988; Maddux & Rogers, 1983; Stanley & Maddux, 1986). Maddux et al. (1986) have provided perhaps the most conclusive evidence that efficacy and outcome expectancies can be manipulated in a nonconfounded manner using a persuasive communications paradigm. The present research adds to this evidence by focusing on participants' efficacy expectancies, concerning whether they could successfully perform a task, and outcome expectancies, concerning whether they would be evaluated (see Bandura, 1986). The present group performance paradigm may offer a unique opportunity to test the proposals of self-efficacy theory and the operation of these two expectancies.

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