

Equity in Effort: An Explanation of the Social Loafing Effect

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Previous researchers have demonstrated an effect termed *social loafing*: People expend less effort when working in groups than when working alone. The explanation of this decrement has been that people can "hide in the crowd" and get away with poor performance because their individual outputs are not identifiable; holding identifiability constant eliminates the loafing effect (Williams, Harkins & Latané, 1981). A second possible explanation, tested in this study, is that people, when working in groups, expect their co-performers to loaf and, therefore, reduce their own efforts to establish an equitable division of labor. A result that was consistent with this second explanation was that participants whose original expectations were violated by new information regarding their co-performer's intended level of effort matched their own efforts to these new expectations. In fact, participants matched their co-performer's level of effort whether their individual outputs were identifiable or not. These results suggest that this equity approach provides a second, viable explanation for the loafing effect. As with identifiability, holding constant the expectations about partner performance eliminates the loafing effect. In addition, a distinction is made between the factors that explain the effect and factors that simply provide limiting conditions for the effect.

In a series of experiments, Latané and his colleagues (Harkins, Latané, & Williams, 1980; Latané, Williams, & Harkins, 1979; Williams, Harkins, & Latané, 1981) have shown that participants put out greater effort when working alone than when working with others; this is an effect termed *social loafing*. This effect has been found for a variety of tasks requiring either physical effort (shouting: Latané et al., 1979; rope-pulling: Ingham, Levinger, Graves, & Peckham, 1974; pumping air: Kerr & Bruun, 1981) or cognitive effort (evaluating essays: Petty, Harkins, Williams, & Latané, 1977; brainstorming and vigilance: Harkins & Petty, 1982). According to Steiner's (1972) terminology, some of these tasks have

been "maximizing" (i.e., requiring the participant to produce as much as possible: e.g., rope-pulling, shouting, brainstorming), whereas others have been "optimizing" (i.e., requiring the participant to achieve some criterion performance: e.g., vigilance, evaluating essays), but on the group trials, all of these tasks have been additive (i.e., the group score has been represented by the sum of the individual efforts). In Davis's (1969) terminology, on the group trials these tasks have been "information reducing."

Latané et al. (1979) suggested several factors that might account for the loafing effect. For example, when participants perform with others, they may feel that they can "hide in the crowd" (Davis, 1969) and avoid the blame for slacking off, or that they are "lost in the crowd" and unable to command their fair share of the credit, or both. Williams et al. (1981) tested the viability of these explanations in two experiments. In the first experiment, participants were asked to shout as loudly as they could alone, in pairs, and in groups of 6. As in previous loafing research in which this shouting

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paradigm has been used (Latané et al., 1979), participants wore blindfolds and headsets over which instructions and a masking noise were played. In this way participants received no feedback regarding the shouting levels of their coparticipants, and knew that these coparticipants received no feedback about their performance. In the first phase of the experiment, participants performing alone put out more effort than when they thought they were shouting with one other (69% of alone effort) or 5 others (63%); they thus replicated the social loafing effect (Latané, et al., 1979). The participants were then asked to don individual microphones and were told that now their individual outputs would be identifiable even when they performed in groups. They then went through the same series of trials, but now they believed that their individual outputs were always identifiable whether they performed alone or together. Under these conditions, participants put out as much effort when they thought they were performing with others as when performing alone.

Using a between-groups design, the researchers replicated this experiment. In a condition that replicated Phase 1 of the first experiment, participants performed alone and together; thus their individual outputs were identifiable only when they performed alone. In a second condition that replicated Phase 2 of the first experiment, participants performed alone and together, but wore individual microphones all of the time; thus their individual outputs were always identifiable. In a third condition, participants performed alone and together, but were told that all individuals' performances would be summed and compared with group performances; thus their individual outputs were never identifiable. A result that replicated that of Phase 1 of the first experiment was that the participants who were identifiable only when they were alone put out greater effort alone than when they performed with others. In a result that replicated that of Phase 2 of the first experiment, when they were always identifiable, participants put out as much effort when shouting with others as when shouting alone. When they were never identifiable, participants put out as little effort alone as when they thought they were performing with others. These results are consistent with the notion that when individual out-

puts are not identifiable, participants may feel that they can receive neither credit nor blame for their performances, so they loaf.

Latané et al. (1979) also suggested that concern about the extent of partner effort could account for the loafing effect. Participants may arrive at the experiment with the notion that in situations in which responsibility for a task is shared, others attempt to minimize their efforts. Certainly, previous experiences on committees or work groups of other kinds would be sufficient to suggest this possibility. If participants believe that others are loafing, this could lead the participants to loaf themselves because there is no reason to work hard when others are not. As one Israeli kibbutznik noted, "When you work in a group there is a natural tendency to feel that you are giving your optimum. 'I am really pulling a big load but those in front of me and behind me are doing a little less'—this feeling naturally creeps up on you unless you have faith in the group within which you are working" (Criden & Gelb, 1976, pp. 61–62). Because the participants in these experiments are working with strangers, there is no reason for them to have "faith in the group."¹

In our experiment we sought to test the possibility that this inferential process could account for the social loafing effect. Using the shouting paradigm, led participants to believe that their partner intended to try as hard as possible, or to hardly try. At the same time we provided feedback meant to convince the participants that they and their partner possessed equivalent ability.

If this inferential process is at work, participants will expect others to work hard alone and to loaf in groups, and, desiring to maintain an equitable distribution of effort, they will do likewise. When participants receive information that contradicts this expectation, they will maintain equity by matching the effort levels they expect from their partners. Thus when

¹ It is also possible that a participant could discover during the course of the experiment that on the group trials, the other participants were putting out less effort than when performing alone. However, in the shouting experiments this possibility is not plausible, because in this research participants could neither see nor hear each other, which provided no opportunity for any discoveries about the others' performances.

their partners suggest that they intend to try as hard as they can, the participants should try hard as well, regardless of whether they are working alone or working with a partner. In addition, when the partners suggest that they intend to put out as little effort as possible, the participants should also put out little effort, regardless of whether they are working alone or working together.

Of course, a number of other outcomes are possible. For example, if lack of identifiability alone underlies the loafing effect, information about the partner's intended effort levels may well have no effect on the participants' levels of effort. Participants work when they think that the experimenter can monitor their efforts, and loaf when they think that the experimenter cannot. Learning that the partner intends to loaf even when performing alone or to work hard even when outputs are pooled may not change the participants' levels of effort. After all, the partner's intentions have no effect on the experimenter's ability to monitor the participants' performances.

Another possibility is that learning the partner's intentions may be enough to change the absolute level of effort, but not to change the loafing effect. Participants may work harder overall if they think that their partner will work hard, and work less overall if they think that their partner will hardly work, but the relative difference between alone and group performance may be maintained.

It is also possible that the partner's announcement of his or her intentions could result in an inverse relation between the level of effort the participants expect the partner to exert and their own levels of effort; that is, when the partner intends to loaf, participants may attempt to make up the shortfall, but when the partner intends to work hard, participants may feel even more free to loaf. This outcome suggests that the participants feel that the experiment requires some specific level of output and, given the partner's intentions, either more or less effort is required to achieve this level.

A study reported by Kerr (1983) provides some reason to expect support for effort matching. In his experiment, participants were led to believe that they were working with a partner to achieve some criterion level of performance in pumping air into a spirometer.

On each trial, if either participant reached the criterion level of performance, the group was deemed successful and each person received \$0.25. According to Steiner's (1972) typology, pumping air approximates an "optimizing" task, because a specified level of performance was required, and was "disjunctive," because the best score in the group represented the group score. The nine-trial experimental sequence was preceded by four practice trials on each of which the actual subject succeeded. The "partner" succeeded on three of the four trials. If one assumes that subjects inferred on the basis of the practice trials that their partner's ability was equal to their own, then when the partner failed on eight of the nine subsequent experimental trials, a set of conditions roughly equivalent to those operative in our low effort condition were created. Apparently the partner was able but unwilling to work. Under these conditions Kerr's (1983) actual subjects succeeded on only 75% of the trials, in comparison with the 90% success rate of the individual controls.

It seems that participants were unwilling to be played for a "sucker" (Kerr, 1983), even if it meant passing up some money to do so. These data suggest that in our study, participants, faced with a person who is equivalent in ability but who intends not to work hard, would match the low effort levels of their partner. There is no equivalent of our high-effort condition in Kerr's (1983) study, and the results for this "sucker" condition can only be taken as suggestive with respect to predictions for our experiment because the tasks differ in several potentially important respects. For example, Kerr's task approximates optimizing, whereas our task is maximizing in that it requires the participants to put out as much effort as they can (Steiner, 1972). Also, Kerr used disjunctive scoring, whereas we used an additive scheme in which the group score is represented by the sum of the individual performances (Steiner, 1972). Lastly, in our group conditions, individual outputs are not identifiable, whereas individual scores were always identifiable in Kerr's experiment.

Method

The participants were 42 undergraduate female students fulfilling an Introductory Psychology requirement. At the large university at which this research was conducted, sign-

up sheets for research participation are posted at one or both of two locations on campus. When the participant arrived to take part in the experiment, she was joined by another female student (actually a confederate) who the participant learned had signed up at the other location. The participants were then greeted by the male experimenter, who escorted them to the experimental room and told them that they would be taking part in a sound production experiment in which they would be asked to shout as loudly as they could, sometimes alone and sometimes in pairs. He went on to say that because people differ in their ability to shout, the participants would be given some tests of shouting ability before the session so that this information could be taken into account in assessing the results.

The experimenter then took the participant to a testing room in which she was given two "tests" of shouting ability. First, she was asked to blow into a tube as hard as she could for 5 s. When she did so, a red light was activated on the instrument into which she was blowing, and the needle on a meter, which the experimenter was observing and the participant could see upside down, moved up a scale. The experimenter carefully noted down the reading and then asked the participant to take a deep breath and to say "Raaaah" for as long as she could. The experimenter noted down the number of seconds and then told the participant that these two tests represented methods of gauging lung capacity that, when combined, gave a highly reliable measure. Also, the participant was told that lung capacity was highly correlated with shouting ability. Lastly, the participant was asked to shout "Raaaah" as loudly as she could for 3 s, ostensibly so that the sound level meter to be used in the experiment could be calibrated.

Of course, this procedure was followed only for the real participant. When the confederate was taken to the testing room, the experimenter and confederate waited the amount of time usually taken by the procedure and then returned to the experimental room. After both participants had been "tested," the experimenter told them that he had to calculate their lung capacities. He then went through the motions of several calculations, consulted some tables, and then told the participants that he had calculated their lung capacities, and it turned out that they had equivalent lung capacities that were both within the normal range. As an aside, he then gave feedback on the practice shout that had been given in the testing room. In all cases, the participant was told that she had shouted as loudly as expected on the basis of lung capacity. The confederate was told one of three things: In a social loafing replication condition (SLR), the confederate was told that she also had shouted as loudly as expected on the basis of her lung capacity; in a high-effort (HE) condition, she was told that she had produced even more noise than would have been expected on the basis of her lung capacity; and in a low-effort condition (LE), she was told that she had produced less than would have been expected on the basis of her capacity. Participants had been randomly assigned to one of these conditions before their arrival.

At this point, the experimenter said that the session could now begin, noticed that he had left the sound level meter in the testing room, and excused himself for a moment to go to get it. While he was gone, the confederate, commenting on what happened immediately before, told the participant one of three things: In the HE condition, she

said she had tried very hard on the practice trial and, because she thought the research was interesting, she was going to try hard throughout the experiment; in the LE condition, she said she had not tried on the practice shout and, because she thought the research was boring, she wasn't going to try hard during the rest of the experiment; and in the SLR condition, she simply made small talk until the experimenter returned.

He then randomly assigned the two women the letters A and B, had them sit in the appropriate chairs, and told them that their instructions would be delivered over their headsets from a tape recorder. On each trial, the letter of the person who was to shout would be given, followed by a countdown and the prerecorded sound of people shouting. They were to begin shouting when the taped shouting began and to shout until they heard a tone. They were reminded that they should shout as loudly as they could and were asked to don their headsets and blindfolds (purportedly to reduce sensory feedback), and the experimental tape began.

The tape had been designed to test for loafing effects with two actual participants and consisted of 10 individual trials (5 for A, and 5 for B), and 10 group trials. Of course, the confederate never shouted, but this fact went undetected by the participants as a result of the blindfolds and masking noise. The tape was played twice, so the participant shouted a total of 20 times, 10 alone trials and 10 trials in which she believed she was shouting in a pair.

The participants' performances were measured on a General Radio sound level meter set on the C scale and slow time constant. Each trial lasted 4 s and the maximum level in decibels reached during each trial served as the score for that trial.

After the shouting was completed, the participants responded to a set of questions designed to allow us to assess the effectiveness of the manipulations. On 9-point scales, participants indicated how much effort they put out alone and in pairs, how much effort their partners put out alone and in pairs, and how good they and their partner were at the shouting task.

The participants then took part in an extensive debriefing in which the experimenter began by describing the basic loafing paradigm and the question that had led to this study. The need for deception was explained, the experimenter then excused himself, and the confederate provided further details about the research and checked for feelings of suspiciousness. All participants gave every indication they had found the events believable, had understood the need for deception, and had found the experience to be an interesting one. They were then dismissed.

Results

Manipulation Checks

Ability. Analysis of the ability ratings in a 2×3 (Self vs. Other \times Condition) analysis of variance (ANOVA) revealed a Self/Other \times Partner Effort interaction, $F(2, 39) = 3.5, p < .04$. The participants reported no reliable differences between themselves and their partner in the HE ($M_{\text{self}} = 5.93, M_{\text{other}} = 7.07$), the SLR ($M_{\text{self}} = 5.93, M_{\text{other}} = 6.14$), or the LE

conditions ($M_{\text{self}} = 6.14$, $M_{\text{other}} = 5.79$). Participants did rate the HE partner as being better at the task ($M = 7.07$) than the LE partner ($M = 5.79$, $p < .05$, Tukey HSD; Kirk, 1982). In any case, at each effort level there was no reliable difference between how good partner and self were judged to be at the task. Thus our precautions to ensure that participants would not perceive differences in ability were successful.

Effort. To check the success of the effort manipulation, we analyzed the participants' ratings of their own and their partner's efforts, both alone and together, in a $2 \times 2 \times 3$ (Alone vs. Pair \times Own Effort vs. Other Effort \times Condition) ANOVA. This analysis revealed main effects for self/other, $F(1, 39) = 4.45$, $p < .05$, and alone/pair, $F(1, 39) = 5.49$, $p < .05$. Overall, participants felt that they had put out more effort ($M = 7.6$) than had their partner ($M = 7.3$), and participants felt that more effort had been exerted by both participants when working in pairs ($M = 7.6$) than when working alone ($M = 7.3$).

A more important finding was a Self/Other \times Partner Effort interaction, $F(2, 39) = 4.64$, $p < .02$. A posteriori comparisons (Tukey HSD; Kirk, 1982) indicated that the participants' own level of reported effort was not affected by the partner's intended level of effort. Participants in the HE ($M = 7.74$), the SLR ($M = 7.71$), and the LE conditions ($M = 7.46$) rated themselves as having exerted equivalent amounts of effort ($ps > .20$). However, participants in the HE condition rated their partner as having exerted more effort ($M = 8.07$) than did participants in the LE condition ($M = 6.53$, $p < .05$). Participants in the SLR condition rated partner effort at an intermediate level ($M = 7.24$), which did not differ reliably from the ratings in the HE or LE conditions ($ps > .20$). Thus it appears that we successfully manipulated the participants' expectations concerning their partner's motivation, while holding their perceptions of the partner's ability constant.

Shouting

For the major analysis the five alone and five group decibel level scores in each of the two replications were transformed into dynes/cm² (a linear scale) and were averaged within

Table 1
Sound Pressure Levels as a Function of Partner Effort and Group Size

Group size	Low effort	Social loafing replication	High effort
Alone	3.73 _a	4.58 _b	6.77 _c
Pair	3.45 _a	3.60 _a	6.66 _c

Note. Means that do not share a subscript are reliably different, $p < .05$ (Tukey HSD; Kirk, 1982).

replication. The $2 \times 2 \times 3$ (Alone vs. Pair \times Replication \times Partner Effort) ANOVA performed on these data revealed a Group Size \times Partner Effort interaction, $F(2, 39) = 5.46$, $p < .01$. The results are presented in Table 1.

Replicating results of previous research on social loafing, participants shouting alone generated more noise ($M = 4.58$) than when they thought they shouted with a partner ($M = 3.6$; $p < .05$). In the HE and LE conditions, these alone/group differences were eliminated ($ps > .20$). In the HE condition, both alone ($M = 6.77$) and pair performances ($M = 6.66$) reliably exceeded the alone performance in the SLR condition ($M = 4.58$, $ps < .05$). In the LE condition, both alone ($M = 3.73$) and pair performances ($M = 3.45$) fell below the alone performance in the SLR condition ($M = 4.58$, $ps < .05$) but did not differ reliably from the pair performance in the SLR condition ($M = 3.60$ $ps > .20$).

Discussion

In order to create the conditions necessary for a test of the effort-matching explanation of social loafing, it was necessary to manipulate the participants' expectations about their partner's intended effort levels, while leaving their feelings about their partner's abilities unaffected. Analysis of the ancillary data suggests that we successfully established these conditions. Although the participants' ability ratings for self and other did not differ within any of the three effort conditions, participants in the HE condition rated their partner as having put out reliably more effort than did participants in the LE condition, whereas participants in the SLR condition rated their partner as having exerted an intermediate amount of effort. Of

course, in previous loafing research, feedback that suggests ability equivalence has not been provided, and it is possible that such information could, by itself, modify the loafing effect. However, analysis of the performances in the SLR condition reveals that this was not the case. When participants thought that they were shouting with an equal ability partner, they put out 79% as much effort as when working alone. This value is very similar to the 82% put out by participants who thought they were working with a partner of unspecified ability (Latané et al., 1979).

The effort-matching interpretation suggests that participants put out less effort on the group trials than on the individual ones because it is this pattern of behavior that they expect of their partners. If this were the case, then providing the participants with information that their partners did not intend to distinguish between alone and group trials should eliminate the difference between the participant's alone and group performance, and it is this information that the intention manipulation was meant to provide. A finding that was consistent with this effort matching interpretation was that in the HE condition, in which the participants were informed that the partner intended to work hard all of the time, no alone/group difference was obtained. Participants worked as hard with their partner as alone and, in fact, worked significantly harder both alone and together than did the alone participants in the SLR condition. Apparently, the confederate's assertion that she was going to try very hard exceeded the participants' expectations of the amount of partner effort expected in the SLR-alone condition. In addition, in the LE condition, in which participants were informed that their partner intended to hardly work, participants put out as little effort working alone as when working with their partner. Thus a result that was consistent with the effort-matching interpretation was that modifying the participants' expectations concerning their partner's effort levels led to changes in the participants' own effort levels.

In suggesting potential explanations for social loafing, Latané et al. (1979) pointed out that when participants performed together, individual outputs were submerged in the group total, so participants could receive neither credit nor blame for their individual perfor-

mances. This lack of identifiability could lead to the reduced effort found on group trials. In consistency with this notion, Williams et al. (1981) found that when identifiability was held constant, the alone/group difference was eliminated. When participants were told that their individual performances could be monitored even when they performed in groups, they worked as hard in groups as alone. When told that their individual outputs were to be summed with those of their partners and that the experimenters would examine only these sums, participants put out as little effort alone as when in groups. Thus when identifiability of individual output was held *constant*, there were no differences in alone/group performance.

A second explanation proffered by Latané et al. (1979) was the effort-matching interpretation tested in our experiment. As with the identifiability notion, when expectations concerning the partner's intended levels of effort were held *constant*, we found that the alone/group difference was eliminated. When the partner suggested that she would always work hard, the participants worked hard, whether working alone or with their partner, and when the partner suggested that she would hardly work, the participants followed suit and reduced their alone performances to their group levels.

Identifiability and information concerning partner intentions are only two of a number of manipulations that have been shown to modify the loafing effect. For example, Harkins and Petty (1982) found that increasing task difficulty or giving participants the impression that they are performing different yet comparable tasks eliminates the loafing effect. Increasing personal involvement has also been shown to eliminate the loafing effect. Brickner, Harkins, & Ostrom (in press) asked participants to evaluate a proposal that they were told would personally affect them (high involvement) or would have no direct effect (low involvement). A manipulation of how responses were handled was crossed with the involvement manipulation: Participants were shown either that their responses would be kept separately, or that they would be pooled. In the low-involvement conditions, participants whose outputs were pooled generated fewer reactions than those whose outputs were sepa-

rated, which was a loafing effect. However, in the high-involvement condition, participants whose outputs were pooled generated as many reactions as participants whose outputs were identifiable. Williams (1981) found that the use of cohesive groups moderates the loafing effect. Participants took part in a typing task in which their individual outputs were individually identifiable or were pooled. The loafing effect, though present when the participants were strangers (low cohesion), was eliminated when the participants were friends (high cohesion).

Although all of these manipulations share the common feature that they moderate the loafing effect, there appears to be a crucial difference among them. For two of these moderators, identifiability and expectations of partner performance, the moderating variable takes on one value when individuals perform alone, whereas it takes on another when they perform in groups. In other words, when participants perform alone, their outputs are identifiable; when participants perform with others, their outputs are not. Holding identifiability *constant* eliminates the alone/group difference (Williams et al., 1981). In our experiment, when participants worked with others, they put out less effort because this is what they expected of their partner. When they performed alone, participants expected their partner to work hard, and so did they. However, when these differing expectations were held *constant*, the alone/group difference was eliminated.

The other moderators do not exhibit this characteristic. For each of these other variables, loafing occurs at one level of the moderating variable, but not at the other. When the participants are strangers, when the task has low personal relevance, when the task is easy, or when everyone is working on the same task, loafing occurs. When these variables were held constant, performance differences between alone and group conditions were still obtained. Thus these factors cannot account for the loafing effect. Instead they seem to provide limiting conditions for the loafing effect, because when participants take part with friends, the task has personal relevance, task difficulty is increased, or participants have their own unique task loafing is eliminated.

Thus identifiability and expectations about partner performance are the only factors that

have been shown to exhibit a pattern of results that is consistent with an explanation of the social loafing effect. However, a second criterion must also be met. One should show that not only do the moderating variables take on different values when participants take part alone and in groups, but that the participants experience the psychological states implied by these different values. For the identifiability factor, this criterion has been satisfied by numerous postexperimental manipulation checks that show higher reported identifiability when participants are alone than when they are in groups. For example, Harkins and Petty (1982) found that participants taking part in vigilance and brainstorming tasks report feeling that their individual outputs are less identifiable when outputs are pooled than when kept separately. For the partner intention factor, this criterion has yet to be fulfilled. When asked how much effort they and their partner exerted alone and in pairs, participants in our research did not report that their partners loafed on the pair shouts. Instead, they reported that they and their partners worked harder in pairs than when alone. In other research (Latané et al., 1979; Williams et al., 1981), participants have reported that everyone worked as hard in groups as when alone. Perhaps this pattern of results should not be surprising because participants in each of these studies were instructed to try as hard as they could on every trial. Reporting that less effort was exerted on group trials by anyone would involve an admission that the experimenter's instructions had been disregarded. For this reason, collecting data that are consistent with this partner-effort explanation is quite difficult, but even so, such supportive data are required for this explanation to be convincing.

Lastly, we return to the issue of why knowledge about the partner's effort should produce a desire in the participant to match this level. As stated previously, Latané et al. (1979) suggested an equity explanation. People match others' efforts because they feel they should do their fair share of the work. Kerr (1983) described his matching results similarly; when one's partner is hardly working, one would be a "sucker" to make up for it by working hard. However, there exists another possibility that might explain the matching phenomenon. It may be that participants are engaging in social

comparison (Festinger, 1954), matching their level of effort not to the partner's level, but to some normative standard that is communicated through the partner; that is, the partner's expressed intention to work hard or hardly work gives the participants information about how people, in general, would respond. Thus participants match effort not because of a sense of fairness or equity, but simply because they are conforming to some standard. Because our experiment was not designed to distinguish between these two alternatives, future research is needed to explicate the matching effect.

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