Group Dynamics: Theory, Research, and Practice
2001, Vol. 5, No. 2, 150–158


1089-2699/01/$5.00 DOI: 10.1037//1089-2699.5.2.150

# Individual Differences in Social Loafing: Need for Cognition as a Motivator in Collective Performance

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Numerous situational factors have been found to moderate the extent to which individuals engage in social loafing, but few studies have investigated the influence of individual differences on individual motivation within groups. The present study examined whether need for cognition, an individual's tendency to engage in and enjoy effortful cognitive endeavors, moderates social loafing effects. It was predicted that individuals with a high need for cognition would be less likely to loaf on a cognitively engaging task. Individuals with a low need for cognition performed significantly better in the coactive than in the collective condition, whereas individuals with a high need for cognition worked just as hard collectively as coactively. Results were interpreted within the collective effort model (S. J. Karau & K. D. Williams, 1993).

Many of the tasks faced by humans cannot be accomplished alone; rather, the effort of individuals must be combined to reach the desired goal. Indeed, such group efforts are a necessary and common element in our society, where committees, military units, athletic teams, film crews, organizational task forces, and students working on group projects represent just a few of the cases in which success depends on the collective performance of group members. Tasks in which individuals must pool their efforts to reach some desired outcome are defined as collective tasks, whereas coactive tasks are those in which individuals work in the real or imagined presence of others but outcomes depend only on one's own personal efforts. Research on social loafing has shown that, under many conditions, individuals tend to exert less effort when working on a collective task than when working on a coactive, or individual, task (see Karau & Williams, 1993), a particularly troubling finding when one considers the pervasiveness of group endeavors. Thus, it is important to identify factors that reduce or moderate social loafing. The present research examined the potential moderating role of need for cognition in social loafing.

## The Collective Effort Model

In their meta-analytic review of the literature on social loafing, Karau and Williams (1993) argued that the theoretical propositions that have been offered to explain individual effort motivation in groups are limited in scope, with each focused only on specific contexts. They asserted that the field lacks a single theoretical framework that can be applied to social loafing under differing conditions. In response to this deficiency, Karau and Williams adapted a more general theory of motivation and proposed an integrative model of individual effort on group tasks, the collective effort model (CEM). Karau and Williams argued that social loafing occurs because the contingency between one's effort and valued outcomes is, in most cases, weaker when working collectively than when working coactively or alone. Paramount to their theory is the idea that when working in a group situation there are many factors other than individual effort that can determine performance on a given task. The CEM specifies that an individual will exert effort on a collective task to the extent that his or her individual efforts will be

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We would like to thank Steven J. Karau for allowing us to adapt his radar detection computer program for this project. We also thank Cristina de Abreu Sampaio for valuable contributions to our research and Tamira Rea and Larissa Duncan for their assistance in data collection.

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instrumental in obtaining valued outcomes (see Kerr, 1983; Kerr & Bruun, 1983). However, if an individual's performance is not perceived to be linked to group performance (low instrumentality), or if the potential outcomes are not valued by the individual (low valence), individuals will not work hard. In addition to these factors, expectancy, or the degree to which high levels of effort are believed to be associated with high levels of performance, is also argued to influence motivation to exert effort in groups. Taken together, effort motivation depends on the product of the individual's perceived instrumentality, expectancy, and outcome value of a given task.

## Factors That Moderate Social Loafing

Acknowledging that group endeavors are common in today's society, researchers have identified conditions and factors that moderate the extent to which individuals engage in social loafing. For example, increasing the identifiability of individual members' contributions (Szymanski & Harkins, 1987; Williams, Harkins, & Latanè, 1981; Williams, Nida, Baca, & Latanè, 1989), enhancing group cohesiveness (Karau & Hart, 1998; Karau & Williams, 1997; Williams, 1981), reducing arousal levels (Jackson & Williams, 1985; Price, 1993), increasing the instrumentality of individual performance on group performance (Sheppard & Taylor, 1999), and providing an out-group comparison standard (Harkins & Szymanski, 1989) have all been observed to reduce or eliminate social loafing under certain circumstances.

Two particularly relevant moderators of social loafing that have been examined are task meaningfulness and personal involvement. Brickner, Harkins, and Ostrom (1986) found that whereas individuals did engage in social loafing on a thought generation task under conditions of low involvement, the effect was eliminated under conditions of high personal involvement. Thus, individuals worked just as hard collectively as coactively on the task when it was presented as personally involving. The role of task meaningfulness has also been demonstrated in Williams and Karau's (1991, Experiment 3) research examining social loafing and social compensation. It was observed that when working with a low-ability coworker, participants engaged in social loafing on a task with low meaningfulness but actually worked harder collectively than coactively (social compensation) on a meaningful task.

Although there has been much research examining potential moderators of social loafing, relatively little attention has been afforded to examining the role of individual differences in social loafing. One recent exception is a study that examined achievement motivation and expected coworker effort in collective task performance. Hart, Karau, Stasson, and Kerr (2000) found that those low in achievement motivation engaged in social loafing on an idea generation task when a coworker was expected to work. Participants high in achievement motivation, on the other hand, did not engage in social loafing regardless of expected coworker effort. Presumably, performing well had intrinsic value for individuals high in achievement motivation, even if such performance was not instrumental in achieving group goals.

Other researchers have also examined individual differences in social loafing. For example, Huguet, Charbonnier, and Monteil (1999) found that individuals who perceived themselves as having average ability on a task did not engage in social loafing. However, individuals who believed that they were superior to others in ability worked harder collectively than coactively on a challenging task but engaged in social loafing on an easy task. In an earlier study examining individual differences in social loafing, Sorrentino and Sheppard (1980) found that approval-oriented swimmers performed better collectively than coactively, whereas swimmers with a fear of rejection were observed to swim faster in individual competition than when swimming in groups. These results demonstrate the moderating role of affiliation-related motives in individual effort motivation in group settings. Williams and Karau (1991, Experiment 1) also found evidence for the role of an individual-differences variable, trust, in social loafing. Specifically, it was observed that people characterized as being average and high on trusting engaged in social loafing on a brainstorming task. However, those low on trusting were observed to engage in social compensation, actually working harder collectively than coactively.

## Need for Cognition

The present study investigated need for cognition as a moderator of social loafing. The need

for cognition construct was introduced by Cohen (1955) and White (1959), but the definition used most often in contemporary research follows Cacioppo and Petty's (1982) conceptualization that people differ in their tendency to enjoy and take part in challenging cognitive endeavors. Because people who are high in need for cognition are intrinsically motivated to work hard on cognitive endeavors, their effort may be less affected by situational factors that lead to social loafing. In an unpublished study examining the effects of need for cognition on social loafing, Petty, Cacioppo, and Kasmer (1985) had participants work collectively or coactively on either a brainstorming or a physical task (this study is described in Cacioppo, Petty, Kao, & Rodriguez, 1986). On the brainstorming task, individuals low in need for cognition performed significantly better in the coactive condition than in the collective condition (social loafing), whereas individuals high in need for cognition performed equally well in both conditions. However, on a physical task, individuals both high and low in need for cognition were found to engage in social loafing (i.e., both groups worked harder coactively than collectively). The authors argued that individuals high in need for cognition are less likely to engage in social loafing when working on a cognitively engaging task. Although these findings are intriguing and show the potential of need for cognition as a motivating factor in group performance, it is worth noting that the two tasks differ on many dimensions. For example, it is unclear whether the contingency between effort and performance is the same for each task. Our research was conducted to further examine the moderating role of need for cognition in social loafing by manipulating the perception of a single task as cognitively engaging or not, thereby eliminating confounds related to using two different tasks.

## The Present Research

In the present investigation, individuals' performance was assessed while working either coactively or collectively on a vigilance task. Although all participants worked on the same task, the perception of the task was manipulated by providing half of the participants with a standard instruction set and task description used in past research and providing the other half with additional information describing the task as thought provoking, intellectual, and challenging (cognitively engaging condition). We predicted that individuals high in need for cognition would perceive the task to be more meaningful in the cognitively engaging condition and thus would be more motivated to perform well on the task. This prediction was based on the CEM's tenet that, all things being equal, social loafing should be reduced when individuals are working on tasks that are perceived to be meaningful or intrinsically interesting. Moreover, research has demonstrated that task meaningfulness and personal involvement can eliminate social loafing (e.g., Brickner et al., 1986; Williams & Karau, 1991, Experiment 3). Thus, individuals high in need for cognition receiving the cognitively engaging manipulation were expected to exert just as much effort collectively as coactively, whereas they were expected to loaf when the task was not engaging. However, individuals low in need for cognition were expected to engage in social loafing regardless of the task perception manipulation because they would not find an effortful cognitive task to be motivating. Thus, one goal of the present study was to determine whether need for cognition would interact with the effect of task perception on social loafing.

Because individuals high in need for cognition tend to engage in and enjoy cognitive endeavors, it can be reasoned that such individuals have the self-perception that they do indeed perform well when working on cognitive tasks. This perception may further lead them to believe that their effort will be both positively related to performance (expectancy) and instrumental in their group's success, two other mechanisms affecting motivation within the CEM framework. Therefore, questionnaire data were collected to measure participants' perceived instrumentality, task meaningfulness, and expectancy. Thus, in addition to replicating the effect of need for cognition on social loafing (Petty et al., 1985) and examining the effects of task perception on social loafing, the present research aimed to explain these phenomena in terms of the CEM.

## Method

### *Participants and Design*

A large sample of introductory psychology students ($N = 669$) were pretested on the short

Need for Cognition Scale (Cacioppo, Petty, & Kao, 1984). Participants whose scores fell in the top and bottom third (those with scores above 72 and below 52, respectively) were invited to participate in the present study. The mean score for the large pretested sample was 62.4 ($SD$ = 10.2), and the mean scores for the high and low need for cognition groups composing the final sample were 74.52 ($SD$ = 4.43) and 49.96 ($SD$ = 7.19), respectively. One hundred sixty students (110 women and 50 men) participated in return for partial course credit. Individuals high ($n$ = 77) and low ($n$ = 83) in need for cognition were randomly assigned to work condition and task description in a 2 (work condition: coactive vs. collective) × 2 (task description: engaging vs. not engaging) × 2 (need for cognition: high vs. low) between-groups design.

## Procedure

On arrival at the laboratory, 3 participants were seated at individual cubicles with partitions that prevented them from seeing one another.[1] Each cubicle was equipped with a computer, 13-in. monitor, and keyboard. Participants were informed that the study was concerned with performance on vigilance tasks. The utility of vigilance tasks as a measure of individual motivation has been demonstrated in past research (e.g., Harkins, 1987; Harkins & Szymanski, 1988). The task required participants to watch for small dots (signals) to appear in the upper left quadrant of the computer screen and to press a key when they appeared. Only the upper left quadrant, which was a 9-cm × 12-cm area, was used so that the task would be more manageable for participants, which was appropriate given that our interest was in motivation and not ability. The instructions were presented on the computer screen but reiterated verbally by the experimenter.

*Work condition.* In the coactive condition, participants read that the study was interested in how many signals they could detect individually. They also read that their individual scores would be recorded by the computer and that they would be shown how many signals they detected at the end of the experiment. Furthermore, they were informed that their individual scores would be compared with the scores of other individuals who had participated in the study.

Participants in the collective condition read that the study was interested in how many signals they could detect together as a group. It was explained that the computer would record their group's score as the sum of their individual performances and that they would be shown how many signals they detected together as a group. They were also told that their group's scores would be compared with the scores of other groups.

*Task description.* The presentation of signals was the same for all participants. The duration between signals was determined with a random procedure in advance, and the location of signals fit a specific predetermined pattern. Thus, the signals appeared at the same time and in the same location on all three computers. As a means of manipulating task description, half of the participants were given standard instructions (nonengaging description), and half were given additional instructions designed to enhance the perception of the task as cognitively engaging (engaging description). These additional instructions involved terms found on the short Need for Cognition Scale (Cacioppo et al., 1984). In the nonengaging condition, participants were told that "this simulation was designed to be very basic in nature because it involves the same basic skills required of people employed as astronomers and air traffic controllers." They also read the following:

> The signals can appear anywhere within the top left quadrant of the screen and they can appear at any time. Thus, it is important that you concentrate as hard as you can and focus your attention so that you can detect as many signals as possible.

On the other hand, participants in the engaging condition were told that "this simulation was designed to be very *challenging* in nature because it involves the same *thoughtful* skills required of people employed as astronomers and air traffic controllers." They read:

> The signals will appear one at a time, in specific, predetermined locations within the top left quadrant of the screen, which, if connected, form a specific pattern (e.g., a geometric shape). Thus, it is important that you concentrate as hard as you can and focus your attention so that you can detect as many signals as possible. The

[1] Occasionally only 2 participants showed up for a session; in such cases, a confederate took the place of the 3rd participant.

pattern of dots forms a complex puzzle, so thoughtful deliberation will enable you to maximize the number of dots you correctly detect.

All participants were instructed to detect as many signals as possible while minimizing the number of false alarms (i.e., falsely reporting the presence of a signal). Participants then completed a 1-min practice trial during which five signals were presented. The signals each appeared for 35 ms in specific, predetermined locations. After the practice trial, participants were asked if they had any questions. Once questions were answered, participants were reminded that the computer would keep track of how many signals they detected individually or how many they detected together as a group. They were told that the experimental trial would last 12 min and that the amount of time between any two signals would vary. They were asked to refrain from talking throughout the entire experiment. Finally, participants were instructed to begin the experimental trial. Twenty-one signals were presented for 20 ms each, and signals appeared in a predetermined pattern in the upper left quadrant of the screen.

At the end of the experimental trial, participants were given a questionnaire to complete. The questionnaire consisted of various items, some of which were designed to assess the effectiveness of the manipulations (e.g., "Was the experimenter evaluating your individual performance or your group's performance?"). Participants were also asked to indicate the degree to which they found the task to be interesting or enjoyable. Other items targeted expectancy ("How well did you expect to perform on this task?"), meaningfulness ("How meaningful was the vigilance task?"), motivation ("How motivated were you on the vigilance task?"), and instrumentality ("How important did you feel it was for you to perform well on the vigilance task?" and "How important did you feel your own performance was to your group's success or failure?"). Participants in the collective condition completed additional items assessing instrumentality and expectancy in terms of the group's success or failure. Participants responded to each item along a 100-point continuum (e.g., *not at all important* to *extremely important*). After completing the questionnaire, participants were debriefed and dismissed.

### *Dependent Measures*

The numbers of hits (correctly responding to stimulus), misses (failing to respond to stimulus), and false alarms (incorrectly responding when a stimulus was not presented) were recorded for each participant. These measures were combined to create a more sensitive overall assessment of performance, which served as the primary dependent measure.[2] This measure of performance was computed with the following formula: $\{[\text{Hits}/(\text{Hits} + \text{False Alarms})] - (\text{Misses} / 21)\} \times 21$. This formula allowed us to determine what proportion of all responses made were hits while adjusting for the proportion of signals missed. The index was bound by the number of signals presented (scores ranged from 0 to 21), with higher scores indicating better performance (a score of 21 would be perfect). In addition, this measure correlated well with the contributing variables, having a strong positive correlation with hits ($r = .864$) and a moderate to strong negative correlation with false alarms ($r = -.615$).

## Results

### *Tests of Manipulations*

Manipulation checks showed that 70% of the individuals in the coactive condition believed

[2] Past research has combined hits and false alarms in one of two ways. First, d-prime from signal detection theory integrates both hits and false alarms relative to the number of response opportunities to measure signal sensitivity. Second, past social loafing research has examined the sum of false alarms and misses (i.e., total signals minus hits), which is simply the total number of errors. We selected the overall performance scores formula presented here for two reasons. First, d-prime is more appropriate for contexts in which participants are asked explicitly whether or not a signal appeared; here correct rejections would need to be calculated through assumptions about the number of opportunities to "not respond" during the vigilance task and this number of opportunities used to calculate false alarm and correct rejection rates. Second, the total error measure yields an observation that may give much more weight to false alarms than misses in a task with few signals (such as our task here). Also, the total errors measure is often quite skewed and does not approximate a normal distribution owing to a small proportion of respondents who have many false alarms. We preferred the measure presented here because it has clear boundaries (0 and 21, the number of signals), avoids the calculation and normality assumptions that are problematic for the other two measures, and still correlates well with d-prime ($r = .94$) and the total number of errors ($r = .89$).

that the experiment was concerned with individual performance, whereas 82% of the individuals in the collective condition thought that the study was concerned with group performance, $O^2$ (1) = 53.22, $p < .05$. In examining the effects of the task description manipulation, it was found that participants in the two task conditions (engaging vs. not engaging) did not differ in terms of the degree to which they found the task to be interesting or enjoyable; participants generally rated the task to be of little interest and not enjoyable ($M$ = 31.2 and $M$ = 22.8, respectively, on 100-point scales). Thus, support for the manipulation of task perception was not found.

### *Performance Data*

A 2 (need for cognition: high vs. low) × 2 (work condition: coactive vs. collective) × 2 (task description: engaging vs. not engaging) between-groups analysis of variance (ANOVA) was conducted on the performance data. The predicted three-way interaction was not significant, $F(1, 152) = 2.05$, $p > .05$, nor were the main effects of need for cognition, work condition, or task. However, there was a significant two-way interaction for need for cognition and work condition on performance, $F(1, 152) = 4.73$, $p < .05$. It was observed that those low in need for cognition performed significantly better in the coactive condition ($M$ = 14.63) than in the collective condition ($M$ = 11.47), a significant social loafing effect. In contrast, those high in need for cognition did not engage in social loafing; in fact, these individuals performed slightly better in the collective condition ($M$ = 14.40) than in the coactive condition ($M$ = 13.68), though this difference was not statistically significant. Figure 1 shows mean performance scores for individuals high and low in need for cognition in each work condition. No significant differences were found in performance between men ($M$ = 14.65) and women ($M$ = 13.14), nor were there any observed differences for ethnicity.

### *Tests of the Collective Effort Model*

A 2 (need for cognition: high vs. low) × 2 (work condition: coactive vs. collective) × 2 (task description: engaging vs. not engaging) between-groups ANOVA was conducted on each questionnaire item. These items examined differences with respect to task meaningfulness, motivation, instrumentality, and expectancy. It was observed that those high in need for cognition ($M$ = 58.5) found the task to be significantly more meaningful than those low in need for cognition ($M$ = 45.4), $F(1, 149) = 11.80$,

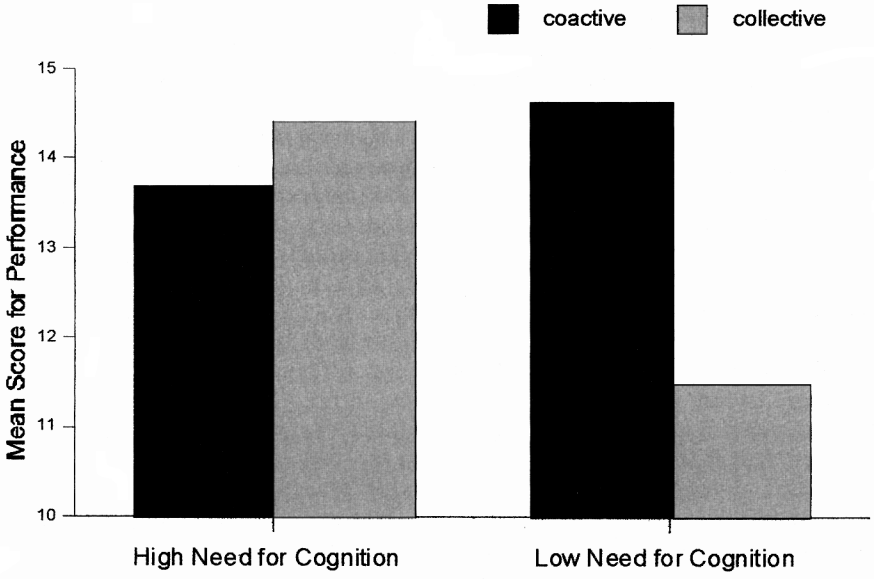


*Figure 1.* Mean performance levels for individuals high and low in need for cognition in collective and coactive work conditions.

$p < .05$. No other significant effects were observed for meaningfulness. Those high in need for cognition ($M = 64.5$) also reported greater motivation on the vigilance task than those low in need for cognition ($M = 54.7$), $F(1, 149) = 4.78$, $p < .05$.

An item designed to assess perceived instrumentality also revealed significant differences for need for cognition, $F(1, 149) = 4.60$, $p < .05$; participants high in need for cognition ($M = 70.7$) indicated that they believed it was more important that they perform well on the vigilance task than did their counterparts low in need for cognition ($M = 61.6$). A second item used only in the collective condition assessed perceived instrumentality in terms of the group's success or failure. Those high in need for cognition ($M = 73.0$) believed that their own performance was significantly more instrumental to the group's success or failure than those low in need for cognition ($M = 57.1$), $F(1, 74) = 10.15$, $p < .05$. No other significant effects were observed for instrumentality.

Reports of how well one expected to perform on the vigilance task revealed a significant two-way interaction between need for cognition and work condition, $F(1, 150) = 7.43$, $p < .05$. This interaction on expectancy was examined by looking at the simple effects of work condition for those high and low in need for cognition. The reports of individuals low in need for cognition were significantly higher when working coactively ($M = 66.9$) than when working collectively ($M = 54.0$), $F(1, 79) = 6.95$, $p < .05$. Individuals high in need for cognition, on the other hand, did not expect to perform differently in the coactive ($M = 59.9$) and collective ($M = 65.5$) conditions, $F(1, 75) = 1.46$, $p > .05$.

## Discussion

This research strongly supports the hypothesis that need for cognition moderates the effect of social loafing. Indeed, it was observed that individuals high in need for cognition did not engage in social loafing when working on a vigilance task. Interestingly, these individuals found the task used in this experiment to be worthy of their effort, regardless of whether or not they were given additional information suggesting that the task was cognitively engaging. Their effort motivation was evident in their responses to the self-report items in the questionnaire, as well as in the performance data. Individuals low in need for cognition, however, exerted significantly less effort when working collectively than when working coactively.

One goal of this study was to use the CEM to explain how need for cognition is related to individual performance on group tasks. The CEM predicts that individuals will be less likely to loaf to the extent that they perceive a task to be meaningful, that they believe their individual inputs are related to group outcomes, and that they expect their own efforts to be related to successful performance. The group that did not loaf, those high in need for cognition, scored significantly higher on measures of all of these constructs than those low in need for cognition, the group that did loaf. Thus, taken together the performance and questionnaire data are consistent with the constructs of the CEM. However, a plausible alternative hypothesis is that these reported perceptions reflect postbehavior justifications for the amount of effort exerted on the task.

A manipulation check showed that the attempted manipulation of task perception was not successful, and it is therefore not surprising that it did not have an effect on social loafing. Thus, the predicted three-way interaction could not be properly tested with this experiment. The particular task used in this study, sitting at a computer terminal waiting for signals to appear, was chosen because we had expected it to be seen as a relatively mundane, uninteresting, and unenjoyable task. We then attempted to manipulate task perception by providing information in one condition that was designed to engage participants high in need for cognition. However, the manipulation check for task description was not significant, and the performance data showed that collective condition participants high in need for cognition maintained high effort motivation regardless of the task description. It is important to note that individuals high in need for cognition are not simply better at the task, because there were no significant differences between participants high and low in need for cognition in the coactive condition. Thus, the need for cognition differences in the collective condition were due to effort rather than ability.

One explanation for why the task description did not have an effect is that the general cover story describing the task as involving the same skills used by astronomers and air traffic controllers may have been engaging to those high in

need for cognition. In retrospect, a more basic cover story in the nonengaging condition, such as "your task is simply to hit the enter key when you see a dot appear on the screen," may have yielded the expected differences with respect to task perception. A second possibility is that the task itself was one in which performance was largely dependent on the amount of attention participants were willing to exert. In the coactive condition, it was not surprising that individuals both high and low in need for cognition attended to the task and performed well, because identifiability was high. However, among individuals in the collective condition, in which identifiability was removed, only those low in need for cognition took advantage of an opportunity to loaf (e.g., Szymanski & Harkins, 1987; Williams et al., 1989). In the persuasion literature, individuals high in need for cognition have been observed to recall more information from a message (Cacioppo, Petty, & Morris, 1983), to be more responsive to manipulations of argument quality (Cacioppo et al., 1983), and to generate more thoughts in response to persuasive arguments (Axsom, Yates, & Chaiken, 1987) than individuals low in need for cognition. The present task may not have been highly cognitive in that it did not require thoughtful deliberation, but it did require careful and constant attention, and research has indicated that individuals high in need for cognition have a greater tendency to attend to stimuli in their environment (see Cacioppo, Petty, Feinstein, & Jarvis, 1996). Thus, it may have been that individuals high in need for cognition were intrinsically motivated to attend to the stimuli, and therefore whether or not their individual efforts were identifiable was irrelevant to their performance.

The present study did have some limitations. As mentioned earlier, the task description manipulation did not affect motivation. Another limiting condition of the study was that individuals participated for only a short time. More often than not, the duration of collective tasks is longer than 12 min. It would be interesting to examine the moderating role of need for cognition in social loafing over a longer period of time. Whether individuals high in need for cognition would continue to work hard in a group situation indefinitely, or whether they would eventually tire of the task and begin to loaf, should be documented.

In the present research, need for cognition was examined as a moderator of individual effort motivation on a vigilance task. Consistent with our hypotheses, need for cognition did serve as a motivational factor: Those with a tendency to take part in and enjoy cognitive endeavors did not engage in social loafing. Thus, the results of the present study not only replicated Petty et al.'s (1985) unpublished findings regarding the role of need for cognition in social loafing but also provided a specific context of explaining the phenomenon by way of Karau and Williams's (1993) CEM. Future research would do well to identify other individual-differences variables as moderators of social loafing effects. By examining these phenomena empirically, we would better understand motivation in group and team performance, which might help in the development and implementation of interventions designed to eliminate motivation losses in group endeavors.

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