EXAMINING SOCIAL LOAFING AMONG ELITE FEMALE ROWERS AS A FUNCTION OF TASK DURATION AND MOOD

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The purpose of this study was to examine evidence of social loafing in elite female rowers when performing a simulation rowing task under alone and group conditions for durations of one-stroke, 1.5-min. and 10-min. Performance was measured as distance travelled (kilometers). A secondary purpose of the study was to ascertain evidence of concomitant changes in mood using the Profile of Mood States inventory. Paired t-tests, comparing performance between each condition (alone and group), indicated an absence of loafing for all alone task durations and for the one-stroke and 1.5-min. group tasks. However, a loafing effect was found in the 10-min. group task. For affect, fatigue decreased only for the 10-min. group condition. Vigor, on the other hand, markedly decreased for all three group tasks, whereas vigor significantly increased for all three individual tasks. No other marked changes in mood scores were detected. It was concluded that social loafing may be partially dependent on motor task duration, with concomitant changes in selected mood states.

L'objectif de cette etude etait d'examiner les indications de paresse sociale chez des rameuses d'elite au cours de differentes taches d'aviron simule-en simule solitaire et en groupe, et pour des durees d'un seul copu, de 1.5 minutes, et de 10 minutes. La performance a ete measuree en distance parcourue (en kilometres). L'etude avait comme objectif secondaire de constater toute indication de variations d'humeur concomitantes, a l'aide de l'inventaire du Profil des Etats d'Humeur (Profile of Moods State). Des tests-t jumeles, comparant le performance dans les deux conditions (en solitaire et en groupe), ont indique une absence de paresse par les trois categories de taches en solitaire ainsi que pour le coup unique et la periode de 1.5 minutes en groupe. En ce qui concerne l'affect, il y a eu une baisse de fatigue seulement dans le contexte des 10 minutes en groupe. On constate, au contraire, une baisse marquee de vigueur pour les trois taches executees en group, tandis qu'il y avait une augmentation importante de vigueur pour les trois taches executees en solitaire. On n'a constate aucune autre variation prononcee dans les scores d'humeur. On en conclut que le paresse sociale dependrait en partie de la duree de la tache motrice, avec des variations concomitantes dans certains etats d'humeur.
In 1927, a French agricultural engineer named Max Ringelmann found that collective group performance, while increasing group size, resulted in substantially less performance efficiency than the sum of individual efforts (cited by Litene, Williams & Harkins, 1979). In particular, he found that three persons on a rope pulling task failed to exert three times as much force as that of one individual. The phenomenon that average individual performance decreases with increasing group size has become known as the Ringelmann Effect or, more recently, social loafing.

Social loafing is "a decrease in individual effort due to the social presence of other persons" (Latane et al. 1979, p. 823). The traditional explanation is that social loafing occurs when subjects perceive the criterion task as unimportant, meaningless, not intrinsically motivating, or performed by relative Strangers under noncompetitive conditions (Hardy, 1990; Hardy & Latane, 1988). This phenomenon is rooted in Latane's (1981) social impact theory which indicates that when an individual is the target of social forces, the amount of social pressure on the targeted person should increase linearity as a function of the strength, immediacy, and number of others. However, if the group rather than the individual is the target of these external social forces, than the group members serve as cotargets of the social impact, diffusing the responsibility throughout the group and allowing each member to exert less effort than if they were alone (also see Hardy, 1990, for a review of this theory). Thus, individuals are less likely to feel accountable for the quality of their performance if they are held collectively responsible for task success. In this way, social loafing has been explained as a motivational loss which, according to Hardy and Latane (1988), may be overcome when: (1) the performer's efforts are identifiable, (2) the individual perceives they are making especially when a unique contribution to the group's effort, performing a task perceived as difficult, (3) individuals perform with friends as opposed to strangers, and (4) when the task personally involves the performer.

One primary explanation of the social loafing phenomenon is the lack of performer identifiability. In his review of related literature, Hardy (1990) found that "when individuals are held solely responsible for the outcome, the social loafing effect is eliminated" (p. 315). For example, in one study, Latane, Williams and Harkins (1979) asked subjects to hand clap and shout in a group context and alone while wearing a headphone. They found that the average sound amplitude produced by groups of two and six persons was 66% and 36%, respectively, of the mean sound for each individual. In a follow-up study, Williams, Harkins and Latane (1981) hypothesized that persons would more likely perform well if their work was identifiable to other people, particularly if the others were sources of reinforcement. They asked six males to shout as loudly as they could for a series of 5-second trials, either alone, in pairs, or in sixes. In one condition, subjects thought that their outputs would be identifiable to the experimenters when they shouted alone, but not when they shouted in groups. In the second condition, all persons believed that their individual outputs would be identifiable to the experimenters even when they shouted in groups. This was assured by having subjects shout into individual microphones. In the first condition, the results indicated that subjects did not produce as much output as would be expected by merely summing the solo performances. The authors concluded that "The addition of microphones virtually eliminated social loafing
in groups" due, ostensibly, to greater identifiability of the subjects' performance (p. 306). Williams et al. (1981) concluded that social comparison and competitiveness are not necessary components of identifiability.

Social loafing has received relatively scant attention by researchers in the sport psychology literature. In a rare sport-related field investigation, Latane, Harkins and Williams (cited by Gill, 1986) compared the swim times of elite swimmers, using identical swim strokes and distances, for relay versus individual events under conditions of high and low identifiability. Identifiability was manipulated by announcing or not announcing the individuals' lap times. A loafing effect was found with faster swim times for the individual events than relay events under low identifiability. However, high identifiability resulted in slower swim times for individual events as compared to relays, effectively eliminating social loafing. The group situation, therefore, appeared to provide a social incentive. Perhaps, then, social loafing may be eliminated under conditions of high motivation, competitiveness, and goal-orientation, all of which are descriptive of elite athletes.

In another sport-related investigation, Hardy and Latane (1988) examined the effect of competitiveness on social loafing. Measuring the shouting and clapping of cheer-leaders under solo and group conditions, their findings supported a social loafing effect. Group cheering produced 94% as much noise as did solo cheering efforts. The authors concluded, contrary to previous explanations of this phenomenon, that "social loafing is not restricted to tasks that are seen as unimportant or meaningless, that lack intrinsic interest, that do not involve competition, or that are performed with strangers" (p. 113).

Skill level may influence a social loafing effect. Using a rowing task similar to the present study, Hardy and Crace (1991) found that competence moderates social loafing. Unskilled performers (nonrowers) exerted significantly less effort, even under alone conditions, and were more likely to loaf than skilled rowers. In a rowing task similar to the current study, skilled rowers reported that they expended more effort when working alone as compared to when working as a team.

Another untested area in the social loafing literature is task duration. Unknown is whether social loafing is a function of longer term, as opposed to relatively short term, task requirements. Examining highly skilled athletes performing a sport task that closely simulates actual performance conditions is another area lacking in the extant research. Hardy and Latane (1988) have concluded that, "Social loafing may be restricted to tasks that are seen as unimportant, meaningless, or lacking in intrinsic motivation, performed by relative strangers in noncompetitive contexts" (p. 109). It appears that research is needed to examine the social loafing effect with subjects who perceive the criterion task as intrinsically motivating and meaningful. One population that fits this criterion is competitive athletes.

Latane (1986) and Hardy and Latane (1988) contend that social loafing may be a function of the individuals' desire to economize their effort when performing in group situations because they can "hide in the crowd" and escape recognition or blame because their
individual efforts are not identifiable. Although Hardy and Latane (1988) suggest that members of established teams are susceptible to these same tendencies to economize effort in groups, this supposition has not been tested among elite athletes. Thus, a central purpose of this study was to overcome the limitations of past investigations in examining the social loafing phenomenon in a sport context among elite athletes.

A particularly surprising omission from the social loafing literature is the failure to document the subjects' emotions or mood state. Previous studies have shown unequivocally that emotions, particularly among elite athletes, plays a central role in sport performance (see Vallerand, 1983, for a review). Geen (1991) contends that individuals naturally reduce their efforts on boring or tiring tasks unless their performances are being monitored by others. Ascertaining subjects' affect is one approach to determining the cognitions that accompany performance and partially explain performance outcomes. One psychological inventory that has been used relatively often in ascertaining emotions in sport contexts is the Profile of Mood States (POMS) (McNair, Lorr, & Droppleman, 1971). Researchers (e.g., Morgan & Pollock, 1977; Tharion, Strowman, & Rauch, 1988) have shown that the POMS accurately describes the emotions of elite athletes, the same population susceptible to social loafing. Ostensibly, social loafing could be partly a function of feelings of fatigue or other unpleasant emotions rather than the performers conscious attempt to reduce effort. The POMS was used in this study to examine this factor.

One sport that is particularly susceptible to examining social loafing and overcoming the limitations of past studies is competitive crew rowing. Crew rowing involves the coordinated efforts of all members, without which performance capability cannot be reached. Crew rowing, as a team sport by which individual effort is not directly ascertained, presents an opportunity for evidence of social loafing. Due to the absence of identifiability in this study (discussed later), it was hypothesized that social loafing would be evident when performing in a group situation in contrast to performing the same task alone. It was also predicted that in a group setting, loafing would be less evident when performing over a short (one-stroke) duration than over a relatively prolonged time period (10 min.). In other words, although a loafing effect was hypothesized for all group performances, loafing was predicted to be significantly more pronounced in the longer than shorter task duration condition. This hypothesis is predicated on self-presentational processes (see Leary, 1992). Leary has concluded, based on a review of related literature, that "Loafing is largely the result of reduced self-presentational pressures in group settings" (p. 344). Previous researchers of social loafing have not tested the influence of self-presentational pressures over time.

**Method**

**Subjects**

Participants consisted of a team of six female elite crew rowers, representing the state of New South Wales, Australia, ranging in age from 20.4 to 23.8 yrs. The subjects were required to engage in the study by their coach. To ensure optimal motivation and control
for the condition of identifiability, the athletes were informed prior to the study that all performance scores in the alone and group conditions would be reviewed by the team's head coach and form the basis for subsequent goal setting.

The low sample size in this study reflected the team's actual size and the need to control for skill level. In addition to the virtual absence of elite athletes in previous social loafing research, Hardy and Crace (1991) found that less proficient team members may be more susceptible to social loafing than more skilled members.

**Equipment and Materials**

The rowing task, measured as average kilometers per hour (kpm), was performed on a Five Concept II rowing ergometer. The POMS (McNair et al., 1971), consisting of six factors (tension, depression, anger, vigor, fatigue, and confusion), ascertained subjects' mood.

**Procedure**

Subjects completed the POMS immediately prior to their first treatment as a baseline measure of mood. The study was conducted in two sessions, interpolated with a period of 48 hrs. Subjects performed the rowing tasks under each of two conditions, alone and simultaneously with five teammates, experienced in counterbalanced order. The rowing tasks, each of which preceded by a one-min. warm-up, consisted of: (1) one-stroke at maximum effort followed by a 10-min. rest, (2) rowing continuously for 1.5 min. followed by a 20-min. rest, and (3) continuous rowing for 10 minutes. Thus, each subject engaged in a total of six performance trials (i.e., group and alone conditions, each under three durations). The sequence in which the three tasks were experienced always occurred from shortest to longest duration to control for physical fatigue.

Immediately after performing each of the six treatments, subjects completed the POMS (McNair et al., 1971). Intraclass reliability coefficients (Cronbach's alpha) were ascertained from these pre-treatment measures. Reliability coefficients for the six POMS factors ranged from .65 to .74.

For group rowing, subjects were situated in a manner that simulated actual crew rowing conditions. To avoid a Hawthorne Effect during data collection procedures, on any given task. Subjects were not told on whom data were being collected. In addition, subjects performed the task without observers (with the exception of the experimenter) to minimize any influence of social facilitation on performance. The Rowing Ergometer measured total distance travelled within the prescribed times. To ensure that the task was meaningful, each participant was asked to offer maximal effort by the team's head coach prior to the experiment, and were told that their scores would be recorded and subsequently reviewed by their coach. Knowledge of results on performance outcome was not offered.

**Results**
Manipulation Checks

Consistent with previous research (Hardy & Crace, 1991), subjects were asked immediately after the study to indicate the extent to which they worked at their capacity on the rowing task on a scale from 1 (very low) to 100 (maximal). Their overall perceived exertion was reported at 89.3% (SD = 4.46) of their capacity on the rowing task. Although subjects perceived their expended effort higher on the group condition (M = 91.0%, SD= 3.12) than for the alone condition (M= 87.0%, SD= 5.02), this difference was statistically similar [t(5) = 2.31, p > .05].

Motor Performance

As three paired t-tests were computed on a single data set (comparing individual and group performance on each of the three tasks), experimental error rate was set at p < .017 using the Bonferroni correction technique. Mauchley tests of sphericity indicated that all models met this critical assumption of parametric statistics. Results for the one-stroke, 1.5-min. and 10-min. tasks, respectively, were, t (5) = 1.06, p > .05; t (5) = 2.01, p > .05; and t(5) = 7.45, p < .04, respectively. Thus, whereas social loafing was not apparent for the two tasks of relatively short duration (one-stroke and 1.5-min.), a loafing effect was evident for the 10-min. task. A comparison of means indicated that performance was measurably poorer in the group than alone condition, reflective of a social loafing effect. Mean distances (kilometers) for individual and group performance are listed in Table 1.

Mood

Two one-way repeated measures multivariate analyses of variance (MANOVAs), one each for the alone and group conditions, were computed to examine the effects of the treatments on the six POMS factors. The dependent variable consisted of change scores derived from the pre-study baseline measure. When performing alone, the MANOVA revealed significant differences in mood between tasks, F (2,14) = 4.86, p < .04. All other mood scores were non-significant (F's ranging from 0.79 to 1.41). Subsequent univariate analyses indicated marked change scores for vigor only. In particular, vigor significantly increased for each of the three tasks (see Table 2 for descriptive statistics and p values).

The MANOVA for the group condition also indicated significant differences in mood between tasks, F (2,14) = 6.39, p < .03. Subsequent univariate analyses showed that fatigue markedly increased only in the 10-min. condition. Significant reductions in vigor occurred for all three group tasks. All other mood factors were non-significant (Fs ranging from 0.52 to 1.16). The descriptive statistics on change scores for all POMS factors and all significant probability levels are presented in Table 2.

Discussion

The primary focus of this study was to ascertain evidence of social loafing in elite female athletes performing a task that was meaningful and simulated actual sport tasks as a function of endurance. It was predicted that loafing would be evident only when
performing in group but not in individual situations, and when the task was relatively prolonged (10 min.) but not short-term (one-stroke, 1.5-min.). The results of the study partially supported these predictions.

According to previous explanations of the loafing phenomenon (see Hardy, 1990, for a review), loafing was not manifested when subjects performed the three tasks alone. However, contrary to expectations and to the results of previous studies (e.g., Hardy & Latane, 1988), social loafing did not occur under group conditions when performing the task for a relatively short duration (one-stroke and 1.5-min.). Only under the condition of performing the task in a group situation under relatively prolonged (10 min.) conditions was loafing evident. The results of this study contradict Brickner, Harkins and Ostrom (1986) who have suggested that social loafing occurs on tasks that performers do not find personally involving, intrinsically important, or do not have personal meaning or important consequences. The subjects in the present study met these criteria and, predictably, did not show a loafing effect for the two tasks of shorter duration. This outcome supported the Hardy and Latane (1988) study in which loafing occurred when the criterion task was personally meaningful to the subjects. Hardy and Latane conclude, in support of the present results, that "Social loafing is not restricted to tasks that are seen as unimportant or meaningless, that lack intrinsic interest, (or) do not involve competition" (p. 113).

The present finding of a loafing effect only for the 10-min. group task but not for any other condition supports the role of identifiability as at least a partial explanation of this phenomenon. As Williams, Harkins and Latane (1981) surmise, performance is enhanced if the individual's efforts and/or work outcomes are identifiable to other people, particularly if the others are sources of reinforcement. In this study, it is possible that social loafing was not detected in the three alone conditions due to the higher degree of identifiability than was present in the three group conditions. However, a particularly unique finding in the current study of elite female rowers is that social loafing was influenced, not merely by the presence or absence of accompanying performers or the degree of physical effort, but by the task's duration (10-min.). One possible explanation for this result is that longer duration of the criterion task may promote identifiability in producing a social loafing effect. This effect may be exacerbated in competitive sport in which performance is observed, evaluated, and compared against the performance of opponents. This explanation is contrary to Williams et al. (1981) who contend that social comparison and competitiveness are not necessarily components of identifiability.

One factor that may influence social loafing and offers a partial explanation of the present results is self-efficacy. Results of a study by Sanna and Shotland (1990) indicated that when subjects expected to perform well, they expected a positive evaluation from the audience, which lead to improved performance relative to subjects who worked alone. In another study, Sanna (1992) found that high-efficacy evaluated participants performed better than alone participants, whereas low-efficacy evaluated participants performed worse than alone participants. In his second study, Sanna found that high-efficacy nonevaluated participants performed worse than evaluated participants, whereas low-efficacy nonevaluated participants performed better than evaluated participants.
According to Sanna (1992), these results suggest that "high efficacy expectancy, coupled with high-outcome expectancy, [both of which are common characteristics of elite athletes (Gill, 1986)], produces expectations of positive evaluation and improved social performance" (p. 776).

The findings in the present study that subjects performed similarly under the group and alone conditions, at least for two of the three task durations, may reflect the personal disposition of high self-efficacy. Evidence of a loafing effect for the 10-min. group condition may partly be a function of subjects' perception of evaluation. As Sanna (1992) concluded in his second experiment, "Only in the evaluation condition did participants believe their performances could be compared and evaluated by the experimenter, a high-outcome expectancy" (p. 783). Thus, it is possible that rowers in this study did not perceive the 10-min. group condition amenable to identifiability through performance evaluation, producing a loafing effect. This explanation is supported by Senna's results, albeit with nonathletes. It appears, than, that social loafing may be influenced by personal orientations as well as social factors. As Hardy (1990) concludes from his review of related literature, "Social loafing can be viewed as an individual difference variable related to personality" (p. 319). Further research on the role of competitiveness, social comparison processes, and self-efficacy in understanding the causes of social loafing in performing a sport skill is warranted.

Apparently, this was the first study examining social loafing in which mood was assessed. Changes in POMS scores indicated that fatigue increased when performing for 10-min. when alone and in a group. In addition, vigor declined measurably when performing all three tasks in the group condition, although performance declined measurably only in the 10-min. treatment. These findings suggest that social loafing may be accompanied by specific emotions that are linked to physiological as well as psychological factors, especially when performing an endurance task. In support of this thesis, Vallerand (1983) reports that "Each emotion is accompanied by specific physiological changes and that these contribute to the experience of emotion" (p. 204). The combination of heightened fatigue with decreased vigor in the prolonged (10-min.) group task may have exacerbated the social loafing effect. Ascertaining subjects' emotions in future research to understand cognitive processes that underlie social loafing in sport appears warranted.

Table 1

<table>
<thead>
<tr>
<th>Condition</th>
<th>Individual Mean</th>
<th>Individual SD</th>
<th>Group Mean</th>
<th>Group SD</th>
</tr>
</thead>
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<tr>
<td>One-stroke</td>
<td>19.8</td>
<td>3.76</td>
<td>20.1</td>
<td>2.31</td>
</tr>
<tr>
<td>1.5-min.</td>
<td>405.6</td>
<td>3.61</td>
<td>408.8</td>
<td>2.72</td>
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<tr>
<td>10-min.</td>
<td>2432.8</td>
<td>3.19</td>
<td>2030.8</td>
<td>3.40</td>
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</table>

Table 2
Descriptive Statistics for POMS Scores
Under Each of the Three Distances for
Alone and Group Conditions.

<table>
<thead>
<tr>
<th>Mood State</th>
<th>Individual</th>
<th>1-stroke</th>
<th>1.5-min.</th>
<th>10-min.</th>
<th>Group</th>
<th>1-stroke</th>
<th>1.5-min.</th>
<th>10-min.</th>
</tr>
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<td>Tension</td>
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<td></td>
<td>3.25</td>
<td>5.85</td>
<td>6.14</td>
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<td>4.66</td>
<td>(2.54)</td>
<td>(1.02)</td>
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<td>Depression</td>
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<td></td>
<td>3.26</td>
<td>3.96</td>
<td>4.02</td>
<td>2.91</td>
<td>3.59</td>
<td>4.08</td>
<td>(3.66)</td>
<td>(4.14)</td>
</tr>
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<td>Anger</td>
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<tr>
<td></td>
<td>3.71</td>
<td>3.38</td>
<td>3.83</td>
<td>3.69</td>
<td>3.16</td>
<td>4.19</td>
<td>(2.41)</td>
<td>(2.14)</td>
</tr>
<tr>
<td>Vigor</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
<td>13.84[**]</td>
<td>13.69[**]</td>
<td>10.79[*]</td>
<td>8.63[*]</td>
<td>9.64[*]</td>
<td>13.02[**]</td>
<td>(3.83)</td>
<td>(2.15)</td>
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<td>3.47</td>
<td>5.73</td>
<td>4.21</td>
<td>3.99</td>
<td>4.70</td>
<td>12.63[**]</td>
<td>(1.51)</td>
<td>(2.44)</td>
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<td>Confusion</td>
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<td></td>
<td>4.09</td>
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<td>4.42</td>
<td>4.26</td>
<td>4.59</td>
<td>(1.97)</td>
<td>(2.61)</td>
</tr>
</tbody>
</table>

* p < .05  ** significant at p < .01 level.

References


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