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**"The Effects of Perceived Collective Efficacy
on Social Loafing"**

by

Frederick M. Lichacz

**A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfillment of
the requirements for the degree of**

Master of Arts

Department of Psychology

Carleton University

Ottawa, Ontario

June 30, 1992

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**"The Effects of Perceived Collective Efficacy
on Social Loafing"**

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**in partial fulfillment of the requirements for
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Thesis Supervisor

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Abstract

This study replicated and extended the original Ringlemann study on collective performance efficiency using a rope-pulling task. The design allowed for replication by using a sample of subjects inexperienced in working together and unpractised in rope-pulling, but extended the analysis by provision of opportunities to examine the role of perceived collective efficacy on performance efficiency. Collective efficacy was represented in two ways: first, through including different groups with different performance histories relative to the experimental task; second, through experimental manipulation of performance feedback. The results of this study revealed that performance efficiency was mediated by both group membership and the experimental feedback. There was also a significant group membership x experimental feedback interaction. A two factor model of collective performance efficiency, involving coordination and motivation, provided the best account of these results. Theoretical and practical implications for the work and sport setting were discussed within this two-factor conceptualization.

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To Sue, your support and encouragement over these last two years ensured that I did not lose perspective of the truly important things in life, and that in itself contributed greatly to the completion of this thesis. Thank-you for all that you have done.

Finally, I dedicate this thesis to my parents. My appreciation and gratitude for all that you have done for me extends far beyond the pages of this project. In every way imaginable, you have made it possible for me to achieve the goals that I have set out to accomplish. The sacrifices that you have made and the support that you have provided will never be forgotten.

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The Effects of Perceived Collective Efficacy **on Social Loafing**

Social loafing and perceived self-efficacy are psychological phenomena that have been given much attention in the study of group and individual behaviour in recent years. Whereas social loafing has been seen as detrimental to a group's performance output, increases in perceived self-efficacy have been shown to have positive effects on individual performance. However, numerous studies have demonstrated that social loafing can be decreased and a plethora of other studies have shown how varying levels of perceived self-efficacy contributed to people's actions. Unfortunately, the value of research in both of these streams for understanding group performance has been limited. For example, social loafing research has relied mainly on the use of ad hoc and pseudogroups to generate most of the findings in this area of research. Furthermore, only recently have there been attempts to apply the principles of perceived self-efficacy to the study of perceived collective efficacy and its subsequent effect on group performance. Moreover, it appears that no study to date has sought to discover how perceived efficacy might interact with social loafing. Because these phenomena have been shown to be important variables in behavioral

research, the following study has been developed to examine what effect different levels of perceived collective efficacy will have on the problem of social loafing in both groups and ad hoc groups.

Literature Review

Historical Account of Social Loafing Research

The research into social loafing has followed an evolutionary path in social psychological research which originates from the first studies that investigated the effects of group membership on individual performance. It was Triplett (1897) who pioneered this inaugural research into group dynamics. Employing a task which had subjects reel in fishing line, both individually and in pairs, Triplett (1897) found that subjects reeled in more fishing line when doing so concurrently with another person performing the same task. Soon after this finding, other researchers such as Allport (1920, 1924), Dashiell (1935), and later Zajonc (1965), reported similar findings on tasks involving free chain associations, mental and written arithmetic, rote learning, and performing in front of an audience.

A finding common in those studies was that the sight of another person performing the same task concurrently acted as a contributory social stimulus, which spurred individuals on to performance outputs that

exceeded their outputs when performing that same task alone. Triplett (1897) suggested that co-workers initiated the release of competitive energy from individuals which could not be accessed when performing alone. This phenomenon observed by Triplett (1897) has since become known as social facilitation (Allport, 1924; Zajonc, 1965). The theory of social facilitation asserts that the presence of co-workers on a task promotes increases in individual performance outputs.

Shortly after Triplett (1897) and other researchers such as Mayer (1903), Schmidt (1904), and Meumann (1904) (see Allport, 1924, pp. 262-265) reported on the facilitative effects on individual performance by performing in the presence of others, a study published in 1913 reported that performing in the presence of others had instead, negative effects on individual performance. Although the preliminary research occurred in the late 1800s, it was not until 1913 that Max Ringelmann, a French agricultural engineer, published his findings on the effects that performing within a group had on the performance outputs of the individual members of the group (see Moede, 1927). As an agricultural engineer, Ringelmann was interested in the relative working efficiency of animals and men in various agricultural applications. For the purpose of

this paper, it is sufficient to report Ringelmann's findings as they pertain to the working efficiency of men.

To study the working efficiency of male subjects, Ringelmann had subjects pull on a rope individually and in groups of various sizes. Although the primary concern for Ringelmann was the investigation of maximum performance of work as a function of pulling method, as measured by the momentary maximum force exerted in kilograms (Kravitz & Martin, 1986), of greater importance was Ringelmann's comparisons of the working efficiency between individuals and various group sizes. Ringelmann soon learned that although the addition of persons to the task led to increases in overall group productivity, the addition of persons also led to an almost linear decrement in the individual group members' average performance. In the first part of his study, Ringelmann had fourteen subjects pull on a rope individually. He then had seven of those subjects pull together collectively, followed by the remaining seven subjects pulling on the rope collectively. Ringelmann then used another group of fourteen subjects in the exact same manner as he tested the first group of fourteen subjects. To determine the relative efficiency of work between the individual and group performances, Ringelmann compared each group of seven's

pulling output with the sum of their individual outputs on this task (see Table 1). This was done for all groups of seven subjects and the entire subjects of the second group.

Insert Table 1 about here

Ringelmann found that in each testing situation, the group outputs did not achieve the same performance output as the sum of the individual outputs. This was also the case when Ringelmann compared the group output of the entire fourteen subjects from the second group to the sum of their individual outputs. Such results are counter-intuitive to the logic of such a task: that a group of subjects, ought to be able to, at the very least, achieve an output equal to the sum of their individual outputs.

In the second part of his study, Ringelmann went on to summarize his findings by illustrating the individual outputs within groups sizes varying from one to eight (see Table 2). It is from these figures that a negative linear trend was found. However, at a group size of seven, the decrease in individual output began to asymptote. Unfortunately, as Kravitz and Martin (1986) noted, these summaries of uncontrolled field studies do not specify the method of pulling used and may be the result

of uncontrolled observations. As such, much of the work that followed Ringelmann on the effects of group-membership on individual performance, may be predicated on less than accurate information. Nevertheless, Ringelmann was able to provide ample evidence to suggest a trend of decreasing individual working efficiency with increasing group size.

Insert Table 2 about here

It is ironic, and certainly not coincidental, that these early studies by Triplett (1897) and Ringelmann (1913) regarding the effects of group-membership on individual performance should yield results that oppose one another. To understand this anomaly, we must differentiate between the two types of approaches taken by Triplett and Ringelmann in their study of group dynamics.

The studies which investigated the effects of social facilitation can be characterized as 'co-action' studies (Allport, 1924; Zajonc, 1965). This characterization is made because the subjects in the social facilitation studies performed the same task concurrently. Subjects were occupied not with each other, but rather, the task at hand. According to

Triplett (1897), the social stimulation that the individuals derived from these situations had its influence at a motivational level. Enhanced performance was thought to be the result of this social stimulation releasing latent energy stored within the individual. This energy release would occur unimpeded by problems of coordination incurred from subjects performing a single task simultaneously.

On the other hand, those studies carried out by Ringelmann had subjects performing a single task simultaneously. In this sort of task, known as an 'additive task' (Steiner, 1966), performance output depends upon the capabilities of each subject involved in the task. According to Ringelmann, motivation contributed little to the observed performance decrements (Hardy, 1990). Instead, Ringelmann hypothesized that such decrements in individual performance were the result of co-ordination loss (Kravitz & Martin, 1986). Ringelmann believed that this sort of task debilitated individual performance within the group because such collective efforts prevented a simultaneity of peak performance by all members of the group, thereby preventing a group output to equal the sum of the individual performances. Ringelmann formulated this explanation on data concerning multi-cycle combustion engines, in which larger engines produced less power per cycle than smaller engines. This

phenomenon has come to be acknowledged as the Ringelmann effect (Ingham, Levinger, Graves, & Peckham, 1974) in honour of its 'discoverer'.

Although Ringelmann's seminal report received only scant attention in the years that followed in the form of literature citations, subsequent researchers who followed Ringelmann's paradigm of examining the performance efficiency of group members, relied mainly on cognitively oriented tasks. In a problem-solving paradigm, Shaw (1932) illustrated that although groups could solve more problems than individual subjects, it took the groups almost six times as long to do so in terms of person minutes (Brown, 1988). In another problem-solving task, Maier and Solem (1952) found that, although groups could facilitate more solutions to a given problem, the number of people providing correct solutions was substantially lower than that which was predicted from the individual performances. And using a brainstorming task, Taylor, Berry, and Block (1958), discovered that the number of ideas generated by a group of individuals did not approach the total that individual outputs predicted should have been generated.

Although these studies differed from Ringelmann's original study in terms of the tasks performed, what they do share with Ringelmann's

research is an emphasis on faulty process (an inability to properly co-ordinate the resources and capabilities of the individual members of the group) as being the primary explanation for the disparity between individual and group performance efficiency (Brown, 1988).

Ringelmann did acknowledge that at least a small portion of this phenomenon was the result of motivational influence (Kravitz & Martin, 1986). Employing cognitively oriented tasks, several researchers (Faust, 1959; Marquart, 1955; and Perlmutter & Montmollin, 1952), provided evidence to suggest support for Ringelmann's claim that motivational factors were in part mediating the differences observed between group and individual performances. In these studies the differences between the observed performances of the groups and those predicted by individual performances were small. Because of such small disparities, there is the suggestion that losses in performance efficiency due to problems of co-ordination were minimal in these situations, and call to mind potential motivational factors (some factor within the group structure that causes an individual to provide less effort than they are capable of) as mediating this phenomenon (Brown, 1988).

In spite of the limited evidence which indicated that motivational factors may, in part, be mediating the Ringelmann effect, early research

on group dynamics continued to emphasize a 'faulty process' explanation for this phenomenon. Further understanding of the social loafing phenomenon may be gained by reference to literature on group dynamics. From his research on group productivity, Steiner (1966, 1972) has shown that the actual productivity of a group is rarely expected to equal its potential productivity. This expectation is given because it is assumed that the human resources required to fulfil the group's potential productivity are rarely coordinated in an optimal manner.

Clearly, the efficiency of a group cannot be assessed until it can be determined what that group can achieve. Just what the group can achieve, according to Steiner (1966, 1972), is a function of the demands of the task, the resources of the group members, and the processes by which the group tackles the task at hand. Task demands, which are determined by the nature of the task, define what sort of resources are needed (i.e., physical and/or cognitive skills) and how they are to be allocated to achieve a successful outcome. The concept of 'resources'

refers to the types and amounts of knowledge and abilities that each member has and how they are distributed throughout the group. Finally, the concept of 'process' corresponds with the steps taken by the group to engage the task. This concept of process involves such things as communicative skills and the assignment of duties for group members.

It is from these three determinants that the potential productivity of the group is assessed. In Steiner's (1966, 1972) terminology, potential productivity is the maximum level of productivity that can be achieved when the group utilizes its resources relevant to the task undertaken. Consequently, the actual productivity of the group is simply the group's observed performance output. Therefore, actual productivity is equal to the potential productivity minus losses due to faulty process, where faulty process includes problems with co-ordination and/or motivation (willingness to work).

Steiner (1966, 1972) utilized different types of group models to determine how the potential productivity of a group can be determined. In an additive model (such as that used in Ringelmann's study), in which all members perform the same function, the potential productivity is equal to the sum of each group member's maximum individual performance. For a disjunctive task, such as Shaw's problem-solving

study (Shaw, 1932), the potential productivity is dependent upon the most skilled member of the group. Therefore, the potential productivity of this task is predicted by the probability of having someone in the group who can solve the problem. With a conjunctive task, where the success of the group depends on the ability of every member, such as a mountain-climbing team, the potential productivity of the group is a function of the least competent member of the group.

By examining various group models to conceptualize the effects of group size on potential group productivity, Steiner (1966, 1972) has been able to posit the liabilities inherent in group membership which prevent groups from achieving maximum performance efficiency. Like Ringelmann, the underlying assumption emphasized to account for a group's inability to achieve maximum performance efficiency has been an inability to co-ordinate the efforts of group members. This assumption rests on the simple premise that while the addition of group members increases overall group productivity, these same additional group members create more links within the group. These additional links in turn make it more difficult to co-ordinate task demands, individual resources, and the processes necessary to mobilize these factors, with the net result being relative decreases in individual

performance with increases in group size. This situation contrasts the situation of the individual working alone where there is no need for interpersonal exchange and co-ordination (Steiner, 1966, 1972).

Following from this, actual productivity equals potential productivity in the individual performance situation, versus the group performance situation, due to the individual situation's lack of complexity.

Consistent with Ringelmann, (see Kravitz & Martin, 1986), Steiner (1966, 1972) did not completely dismiss the role of motivation as a contributory factor in performance decrement. Steiner (1966, 1972) merely treated motivation as having less of an impact. However, there are circumstances where motivation may have been the prime source of performance decrement. Such a situation may arise when differences between the actual productivity and potential productivity of a group are not significantly different as was the case with the studies by Perlmutter and Montmollin (1952) and Marquart (1955). In these cases, because the differences were slight, it appears that co-ordination of effort had little to do with the outcome and thus any discrepancies found may be attributed to deficiencies in motivation.

Replication of Ringelmann's study

Even after Steiner's (1966, 1972) comprehensive examination of the effects of group size on the individual group member's performance output, the nature of this effect was still not resolved. Although co-ordination loss was identified as the primary source of a group's inability to achieve its potential performance level, there began to arise at that time suspicion as to the accuracy of such an explanation. To address this issue further, Ingham et al. (1974) attempted to replicate the original Ringelmann study. This replication was undertaken for a number of reasons. First, the theoretical developments of Steiner (1966, 1972) at that time rejuvenated interest in Ringelmann's findings. Second, until this time, there had not been an attempt to replicate Ringelmann's study. The significance of this replication arises from Kravitz and Martin's (1986) remarks regarding the scant information surrounding Ringelmann's research procedures and data collection. Finally, the then recent theoretical developments by Davis (1969) and Latané and Darley (1970) about the effects of group size on group members' motivation contributed to the development of the Ingham et al. (1974) study.

In the first part of their experiment, Ingham et al. (1974) developed a more sound design than that used by Ringelmann by controlling for slippage during the pull, the angle of pulling, fatigue and practice effects, and using a more reliable measurement of pulling performance. With such controls in place, Ingham et al. (1974) were able to replicate the Ringelmann effect. With an individual working alone assumed to represent 100% working efficiency, Ingham et al. (1974) noted that additions of 1 and 2 co-workers resulted in average member efficiency decreasing by 9% and 18% respectively. While the addition of three individuals resulted in individual performance deficits of 82%, a group size of 6 resulted in an average member efficiency of 78%.

These findings represented only a partial replication of the original Ringelmann study because, even though Ingham et al. (1974) were able to produce a negative curvilinear trend in individual performance with increases in group size, this trend did asymptote beyond the addition of three members. Such results may simply reflect a more sound experimental design and not provide direct evidence regarding the nature of the performance decrements.

The second part of the Ingham et al. (1974) study dealt with discerning whether or not this effect was due primarily to co-ordination loss or motivational loss. To examine this, Ingham et al. (1974) used in the group pulling conditions. The confederates were told only to mimic the rope pull task, not really pull, to ensure that the subjects were actually pulling alone. In this way, any decrements in pulling performance when the subjects were pulling in the these pseudo-group conditions, would be attributed primarily to losses in motivation.

With losses to co-ordination controlled for and motivation thus isolated, Ingham et al. (1974) again discovered a negative curvilinear relationship between group size and group performances. Ingham et al. (1974) took this as evidence to support the assumption that individual motivation to perform decreases as group size increases. Thus it would appear that past studies had underestimated the contribution of motivational factors to the inability of a group's actual productivity to equate its potential productivity.

Variations in methodology. Shortly after the findings of Ingham et al. (1974), other researchers engaged in a renewed interest in the effects of group size on individual performance. Moreover, the research carried out by Ingham et al. (1974) initiated a shift in thinking regarding

the impetus underlying the Ringelmann effect. These new studies, while acknowledging the contribution of co-ordination loss, began to emphasize the motivational aspects of individual performance decrements within the context of group performance.

The most important of these studies came from Latané, Williams, and Harkins (1979). These researchers were interested in the Ringelmann effect for a number reasons. Like Ingham et al. (1974), Latané et al. (1979) felt that such an important phenomenon warranted replication, especially after scant citations surrounding Ringelmann's experimental procedures, and data gathering techniques. Additionally, there was the issue of whether the Ringelmann effect could be obtained with other tasks.

Also, Latané et al. (1979) felt that this was an excellent opportunity to test Latané's new theory of social impact (Latané, 1973; Latané, 1981); a theory was born from earlier research by Latané and others on bystander intervention (Latané & Dabbs, 1975; Latané & Darley, 1968; 1970; Latané & Rodin, 1969; Levy, Lundregan, Ansell, Fell, Fink, & McGrath, 1972). Because of the social and motivational aspects of social impact theory and bystander intervention, Latané et al. (1979) were at least implicitly challenging the earlier

emphasis on the more physically oriented process of co-ordination loss inherent with increases in group-member-links, espoused by Ringelmann (see Kravitz & Martin, 1986) and Steiner (1966, 1972).

In the first part of their experiment, Latané et al. (1979) attempted to replicate the Ringelmann effect using a task other than rope-pulling. To this end, a noise production task was employed to judge both individual and group performance decrements. In this portion of the experiment, subjects were asked to make as much noise as they could in groups composed of 1, 2, 4, and 6 individuals. Latané et al (1979) found that, although noise production increased with subsequent additions of members to the group, this increase in noise was not proportionate to the number of people in the group. In fact, two-person groups performed at only 71 % of the sum of their individual capacity, four-person groups at 51 %, and six-person groups at 40 % (Latané et al., 1979). Such findings provide support for the inverse relationship between group size and individual performance as reported by Ringelmann (see Kravitz & Martin, 1986) and Ingham et al. (1974), even though Ingham et al. (1979) reported that this curvilinear relationship began to asymptote at a group size of 3 members.

In the second part of their study, Latané et al. (1979) strove to discern between co-ordination loss and motivation loss as the primary source of decrement in individual performance during the group task. To do this, Latané et al. (1979) again, told subjects that they would be shouting as loud as they could in various group sizes. However, this time, Latané et al. (1979) told subjects that they were testing the effects of sensory feedback on sound reduction in social groups. As such, subjects were told further that they would be blindfolded and wearing headphones so that group members could not see nor hear one another. Through the headphones the instructor told the subjects how many others they would be performing with. Of course, similar to the Ingham et al. (1974) study, the subjects always performed by themselves.

Like Ingham et al. (1974), Latané et al. (1979) demonstrated an inverse relationship between group size and individual performance efficiency when co-ordination loss was controlled. Even though the same relationship was obtained, noise production in the 'alone' setting was slightly more intense. Latané et al. (1979) postulated that this difference could have been the result of the blindfolds and headphones eliminating any embarrassment associated with performing such an odd task, or that people often inappropriately speak louder when unable to

properly judge the loudness of their voices, or that the subjects were no longer influenced by the pressure of social conformity. Nevertheless, because of the differences between tasks, Latané et al. (1979) felt that, at least in a shouting task, performance loss was contributed to rather equally by both co-ordination and motivation loss.

The importance of this study derives not solely from its replication of the Ringelmann effect, but rather, from its explanation of the observed performance decrements. Although Latané et al. (1979) suggest that the 'group' performance outputs in their study can be attributed equally to co-ordination and motivation loss, it is plausible that their explanation implicitly emphasizes a greater contribution by the motivational aspects of group membership to individual performance decrements. This idea is brought forth from Latané et al.'s (1979) labelling of the Ringelmann effect as social loafing, and its subsequent explanation. It is from the Latané et al. (1979) study that the term 'social loafing' was introduced to explain this phenomenon.

Not only does the terminology itself, social loafing, emphasize a motivational component for sub-potential group performances outputs which overrides performance deficits due to co-ordination loss (which connote a more physical component), but its explanation suggests that

any co-ordination loss that is incurred, may indeed follow from a lack of motivation associated with group membership. Latané et al. (1979) suggested firstly, that social loafing may arise out of a group member's inaccurate assumption that other group members are not performing as well as they should. This perception may arise because, since a group member is in touch with his own contribution, the contribution of others may seem to be less than his own. Therefore, an individual may not want to provide an 'inequitable' amount of effort and thus decide to achieve an 'equitable' amount of effort by lowering his effort to that of the other 'loafers' (Geen, 1991).

Second, social loafing may be the product of group members' beliefs that the group as a whole can only achieve an approximation of the desired goal of the instructor. As such, group members would feel that they could perform less hard than they would if they worked alone. However, even Latané et al. (1979) concede that this reasoning is relatively weak given the data from the second experiment of their study.

Finally, Latané et al. (1979) put forth the assumption that social loafing may be born out of an individual's feeling 'lost in the crowd'. Within the group, unless some means were provided whereby individual performance output could be measured directly, a group member can

escape the consequences of not 'pulling their own weight'. Armed with this knowledge, individuals may simply 'slack off' preferring to 'ride on the coat-tails of the other members'. On the other hand, individual members may feel that because there is no contingency between their input and the group's output, they will not be properly compensated for their fair share of the work. In this case, Latané et al. (1979) propose that individual members may become lethargic or depressed and not perform to their peak capacity. Or as Kerr and Bruun (1981) suggest, the task may be so uninteresting that it 'unmotivates' the individual to hide his lack of effort. Geertman (1991) refers to this situation of hiding in the crowd as 'evaluation apprehension'.

Earlier studies on bystander intervention provide valuable insights as to why social loafing may occur. The notion of 'diffusion of responsibility' (Latané & Darley, 1970), so prevalent to the bystander intervention research, lends itself well to the social loafing research. According to Latané and Rodin (1969):

If only one bystander is present at an emergency, he bears 100% of the guilt for not acting. If others are present, the onus of responsibility is diffused, and the individual may resolve his

conflict between intervening and not intervening in favour of the latter alternative. (p. 199)

Following this, given the choice to work hard or slack off within the group, the individual may choose the latter as there is a lessened contingency between individual input and group output. In fact, this diffusion of responsibility explanation has been cited as a contributing factor to social loafing by Ingham et al. (1974) (though Ingham et al. (1974) did not use the term social loafing), and by Petty, Harkins, and Williams (1980) on cognitive tasks in the form of a 'diffusion of cognitive effort'.

Zimbardo's (1969) work on deindividuation is also relevant at this juncture. The concept of deindividuation is used to explain the feelings of anonymity associated with group membership. This anonymity is felt to be strongly related to losses of individual responsibility. In fact, it has been shown (Ziller, 1964) that the problem of deindividuation, as with social loafing is compounded as the size of the group increases. Therefore, deindividuation may be an important component in the social loafing phenomenon.

Despite the contributions made by both the bystander intervention studies and the work on deindividuation, Latané et al. (1979) remarked

that the explanations pertaining to the social loafing phenomenon can be subsumed under Latané's theory of social impact. Within the context of social impact theory, social loafing is a function of the number of individuals within the group, and the strength and immediacy of social forces (e.g. anyone or anything that judges an individual's performance) acting upon the individual (Latané, 1973). Social impact theory assumes that each group member is the target of forces whose source is external to the group. The net result of these forces is to maximize individual responsibility and effort. According to Latané et al. (1979), increasing the number of persons within the performing group diminishes the pressure of the social forces on the individual. This 'division of impact' will therefore lead the individual to reduce his effort whenever individual output cannot be obtained. Moreover, the more salient, the more close in space or time, and the more social forces there are, the greater the degree social loafing will be. Latané (1973) explains the degree to which social loafing occurs within the context of social impact theory in terms of an inverse power function, a mathematical procedure beyond the scope of this paper.

Subsequent research has supported the robust nature of the social loafing effect. Social loafing has been shown to exist in an array of

physical tasks such as noise production (Cohen, 1988; Hardy & Latané, 1988; Harkins, Latané, & Williams, 1980; Williams, Harkins, & Latané, 1981), rope-pulling (Lichacz & Partington, 1990), running (Huddleston, Doody, & Ruder, 1985), swimming (Williams, Nida, Baca, & Latané, 1989), pumping air (Kerr & Bruun, 1981), rowing and hand grip (Hardy, 1989), and in such cognitive tasks as evaluation tasks (Petty, Harkins, & Williams, 1980; Petty, Harkins, Williams, & Latané, 1977; Weldon & Gargano, 1985; Weldon & Musteri, 1988), brainstorming (Harkins & Jackson, 1985; Harkins & Petty, 1982), maze performance (Jackson & Williams, 1985), and thought listening (Brickner, Harkins, & Ostrom, 1986). As well, social loafing has been found to exist in group performances for both males and females (Harkins et al., 1980), in standing and ad hoc groups (Lichacz & Partington, 1990; Latané 1986), and across cultures (Gabrenya, Wang, & Latané, 1985; Latané, 1981; Ward, 1982; Weiner, Pandey, & Latané, 1981; Williams, Williams, Kawana, & Latané, 1984).

Remedies for social loafing. Inasmuch as social loafing has been found to be a robust characteristic of group performance, several factors have been identified which appear to moderate this phenomenon. The degree to which social loafing can be decreased has been demonstrated to

depend upon the degree to which individual performance within the groups is made identifiable (Lichacz & Partington, 1990; Weldon & Gargano, 1985; Williams et al., 1981; Williams et al., 1989), the highlighting of unique contributions to the group made by the subject (Hardy, 1989; Harkins & Petty, 1982; Kerr & Bruun, 1981), the ease with which evaluations of individual performances can be made (Harkins, 1987; Harkins & Jackson, 1985; Harkins & Szymanski, 1987), task difficulty (Harkins & Petty, 1982; Jackson & Williams, 1985), task attractiveness and uniqueness (Zaccaro, 1984; Harkins and Petty, 1982), task salience (Brickner et al., 1986; Lichacz and Partington, 1990, Sheppard & Wright, 1989), performance feedback (Szymanski & Harkins, 1987), and cultural variables (Gabrenya, Wang, & Latané, 1985; Latané, 1981; Ward, 1982; Weiner, Pandey, & Latané, 1981; Williams, Williams, Kawana, & Latané, 1984). These studies have shown that certain variables do exist which can be implemented to decrease the debilitating effects of social loafing. Thus, there is hope that social loafing does not necessarily have to be a necessary consequence of group performance.

Issues to be resolved. One main feature of the studies investigating social loafing is the reliance on the use of both 'ad hoc' and

'pseudo-groups' to study this phenomenon. An ad hoc group consists of two or more individuals who are put together for the purpose of engaging in a task for a very brief time and are then disbanded. The subjects (volunteers) in the Ingham et al. (1974) study comprised ad hoc groups. Pseudo-groups on the other hand are comprised of confederates who appear to be performing the task but are not. Such 'groups' are created to examine what effect the presence of other people 'performing' some task have on an individual who is actually engaged in the task. A pseudo-group may also be a group that does not exist at all. The application of such a group was employed in the Latané et al. (1979) study when subjects shouted as loud as they could, believing that they were doing so within a group but were in fact performing alone.

To the best of the author's knowledge, none of these studies have utilized 'groups' as identified by the following definition:

a (group) involves two or more people who are aware of each other, who both influence and are influenced by one another, who are engaged in an ongoing and relatively stable relationship, who share common goals, and who view themselves as belonging to a group. (Alcock, Carment, & Sadava, 1988, p. 414)

Moreover, no studies have used groups performing a task specific to that group's experience and orientation, in order to study social loafing. The only studies that have, at best, approximated this issue were those studies employing cheerleaders in noise production tasks (Hardy & Latané, 1988; Williams et al., 1981). Although these cheerleaders were studied in intrinsically motivating team-related tasks (Hardy & Latané, 1988), the cheerleading squads were nevertheless arranged into ad hoc groups.

Shift in theoretical perspective. This historical account of the social loafing phenomenon has demonstrated the manifest nature of social loafing in group performance, with the caveat that the literature lacks ecological validity in terms of the types of groups and tasks employed. Yet, this review has also made apparent a shift in emphasis from a lack of coordination or faulty process account of social loafing, toward a motivational account of social loafing. Emphasized by Ringelmann and maintained by researchers for approximately 50 years the social loafing effect has primarily been accounted for as an inability of two or more people to co-ordinate their performance in an optimal manner such that the group's actual productivity is equal to its potential productivity. However, beginning with the work of Ingham et al. (1974), and specifically Latané et al. (1979), the research area has shifted from a

theoretical commitment to process loss, to a consideration of the motivational aspects of this phenomenon. This motivational account highlights the psychological influence that the group has on its members. Consequently, social loafing is treated as a phenomenon which exists at a level beyond the mere co-ordination of effort. The group is now seen as impacting negatively on the individual member's motivation to perform. In this way, social loafing currently represents the deterioration of the individual's motivation to achieve when performing in a group.

A motivational construct relevant to group performance has been recently proposed by Bandura (1982a). For Bandura (1982a), the ability of a group to overcome the debilitating effects of group membership and other external disturbances resides within the collective efficacy of the group. According to Bandura (1982a):

The strength of groups, organizations, and even nations lies partly in people's sense of collective efficacy that they can solve their problems and improve their lives through concerted effort. Perceived collective efficacy will influence what they choose to do as a group, how much effort they put into it, and to produce results...(p. 143)

Bandura's theory of collective efficacy can be seen as an application of his theory of perceived self-efficacy. However, while collective efficacy is rooted in self-efficacy, it is wrong to assume that these two constructs are identical. Each construct addresses concerns which are qualitatively different from one another in terms of the nature of motivation, goal setting, and attributional explanations (Carron, 1988).

Bandura's theory of self-efficacy. According to Bandura (1977a), self-efficacy refers to the conviction that one can successfully execute the behaviour required to produce outcomes. This notion of self-efficacy is concerned not with the skills one possesses, but rather, with judgements of what one can do with whatever skills one possesses. Through a series of studies with phobic subjects (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977; Bandura, Adams, Hardy, & Howells, 1980), Bandura was able to support his claim of a cognitive mechanism that mediates behaviour.

Bandura's theory of self-efficacy (1977a) was a move away from traditional learning theories based on contingency learning which postulate behaviour as being shaped primarily through stimulus-response relationships. Instead, representing the importance of cognitive processes in the acquisition and retention of behaviour, the explanation of

behaviour by means of perceived self-efficacy is in terms of some central processing of direct, vicarious, and symbolic sources of information. From observing the behavioral outcomes of others and the effects of their own actions, individuals come to discern which skills and actions are needed and appropriate in differing situations.

Although this may appear very similar to, if not equivalent to, contingency learning, Bandura (1977a) explained that, although behaviour and behavioral changes do rely on cognitive representations of contingencies, people are not much affected by paired stimulation unless they recognize that the events are correlated. What Bandura meant by such a statement was that environmental stimuli do not possess a controlling effect on individual behaviour, but rather, a predictive function. That is to say, the regulation of behaviour resides within the individual and not the stimuli. People act as agents over their environment by engaging in reflective thought based on their knowledge, cognitive, and behavioral skills, in the face of information feedback (Bandura, 1977a, 1989).

Since perceived self-efficacy is concerned with judgements of how well one can execute courses of action required to deal with prospective situations (Bandura, 1982), the higher an individual's perceived self-

efficacy is, the more likely that person will be to engage in tasks that are both difficult and challenging (Bandura, Adams, Hardy, & Howells, 1980). Performance success in turn, strengthens perceived self-efficacy, which further cushions the debilitating effects that occasional performance failures would have. On the other hand, those who judge themselves inefficacious tend to shy away from, or fail to enter, tasks that are beyond their perceived abilities. Yet, when they do enter any sort of task, low self-efficacy perceivers do so with less effort and persistence as tasks become more taxing to them (Brown & Inouye, 1978). It appears that those high in perceived self-efficacy engage in positive self-appraisals of coping ability while those who judge themselves inefficacious in coping with environmental demands tend to engage in frequent self-appraisals of inadequacy and cognize potential difficulties as more formidable than they really are (Bandura, 1981). Therefore, it could be the case that faulty self-appraisals (whether they be under- or over-estimates of self-efficacy), rather than actual self-percepts of efficacy, are at work in perpetuating low self-efficacy perceptions.

Regardless of whether high or low perceptions of self-efficacy are the result or accurate of faulty self-appraisals, self-efficacy judgements

must be viewed as proximal determinants of behaviour. A number of sources of discordance effect the accuracy of the relationship between perceived self-efficacy and action (Bandura, 1982a). According to Bandura (1982b), although people may have the requisite skills and strong percepts of self-efficacy, actions may not equal measures of self-efficacy because of lack of incentive or motivation, deficient resources or equipment, physical and social constraints, or continuous reinterpretation of personal competencies. All of these 'disruptions' contribute to the proximal characteristic of this relationship.

There are four primary sources from which perceived self-efficacy develops. The first comes from performance accomplishments (Bandura, 1977a). Performance accomplishments provide the strongest source of efficacy information because they are based on direct mastery of experiences (Bandura, Adams, & Beyer, 1977; Feltz, Landers, & Reeder, 1979). A second source of self-efficacy comes from vicarious experiences (Bandura, 1977a). Although vicarious experiences are less influential than enactive attainments, observing other people succeed or fail of some task also influences the level of perceived self-efficacy (Bandura, Adams, Hardy, & Howells, 1980; Brown & Inouye, 1978). Bandura (1977a) also commented on the influential nature of verbal

persuasion. Here, the 'power of suggestion' is employed to induce higher levels of self-efficacy in an individual without the use of any direct manipulation or observations of experience. Even with its obviously limited power, as long as individuals believe that they can produce some effect through their own actions (Bandura, 1977a, 1982a), verbal persuasion can heighten an individual's perceived self-efficacy enough to successfully accomplish a task (Chambliss & Murray, 1979). Finally, perceived self-efficacy can be influenced by emotional arousal (Bandura, 1977a; Feltz & Mungo, 1983). Because high arousal usually debilitates performance, individuals are more likely to expect success when they are not beset by aversive arousal than if they are tense and viscerally agitated (Bandura, 1977a).

Since Bandura's initial work on self-efficacy, numerous studies have been conducted across a variety of research domains to test the explanatory and predictive ability of his thesis. These studies represent diverse modes of influence that support the notion that perceived self-efficacy is a cognitive mechanism mediating individual behaviour. Perceived self-efficacy has been demonstrated to facilitate behavioral change in individuals with severe phobias (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977; Bandura, Adams, Hardy, & Howells,

1980; Bandura, Reese, & Adams, 1982; Gauthier & Ladoucer, 1981), stress and physiological arousal (Feltz & Mungo, 1983; Litt, 1988), athletics (Barling & Abel, 1983; Brody, Hattfield, & Spalding, 1988; Feltz & Mungo, 1983; Gould, Hodge, Giannini, & Peterson, 1989; Gould & Weiss, 1981; McAuley, 1985; Meyers, Cooke, Cullen, & Liles, 1979; Weinberg, 1985; Weinberg, Gould, Yukelson, & Jackson, 1981; Weinberg, Yukelson, & Jackson, 1980), self-regulation (Condiotte & Lichtenstein, 1981; Slater, 1989), and achievement striving (Bandura & Shunk, 1981; Betz & Hackett, 1981). Through the use of different treatment techniques to increase perceived self-efficacy and subsequent coping ability, analyses conducted both prior to and at the completion of treatment, show behavioral changes corresponding closely to the level of self-efficacy change (Bandura, 1982a).

The current conceptions of collective and self-efficacy have their origin in the rich legacy of group dynamics research (Frank, 1941; Lewin, 1948; 1951; Lewin, Dembo, Festinger, & Sears, 1944). These investigators were interested in discovering those factors which contributed to individual motivation in goal-directed behaviour. Specifically, these researchers were trying to discern which factors, both

personal and environmental, contributed to the creation and deterioration of an individual's level of aspiration in a performance situation.

This seminal work on levels of aspiration research was expanded through the work of McClelland, Atkinson, Clark, and Lowell (1953) and Atkinson (1964) on need achievement (n Ach). The research undertaken by these researchers represents a mathematical approach for explaining the need to achieve in individuals. Within this research, the concepts of self-confidence and self-esteem are closely associated with individual n- Ach. It was the relationship between the concepts of self-confidence and self-esteem and n Ach, as well as their further relationship with the concept of personal competence, which helped propel Bandura toward his theory of perceived self-efficacy (Cox, 1985).

In essence, Bandura's (1977a) theory of self-efficacy outlines the causes, and enhancement, of achievement motivation. The theory's most critical assumption is that repeated successful performances will increase an individual's level of perceived self-efficacy and ultimately the individual's need to achieve; failures will lower these perceptions and needs. Consequently, increases in perceived self-efficacy will lead to improved performance, while consistent failures will deteriorate this need to achieve.

Research on collective efficacy. Although Bandura and his colleagues have provided overwhelming support for his theory of self-efficacy, all of the studies mentioned have only explored the relationship between perceived self-efficacy and individual behaviour. However, much of our time is spent within group settings, be they athletic, political, economic, religious, family, etc. Consequently, as individuals we face many challenges that require a collective effort to overcome obstacles or produce change. For this reason, any endeavour to gain knowledge of human behaviour would be incomplete without examining the nature of the group and the psychological potency it exerts on its members. As pointed out by Cartwright and Zander (1960):

Whether one wishes to understand or to improve human behaviour, it is necessary to know a great deal about the nature of groups. Neither a coherent view of man nor an advanced social technology is possible concerning the operation of groups, how individuals relate to groups... (p. 4)

According to Bandura (1982a), collective efficacy is defined as a group's judgement of the group's capabilities to organize and execute courses of action required to attain designated types of performance.

Furthermore, collective efficacy is not concerned with the skills that the group has, but with the judgements of what the group does with whatever skills it possesses. To this end, similar to perceived self-efficacy, the level of confidence that the group exhibits is an important consideration of how well the group performs.

Spink (1990) has shown that only recently has there been an attempt to empirically test how collective efficacy impacts on group performance. Similar to the findings from research on perceived self-efficacy, Spink (1990) demonstrated that a group's sense of collective efficacy is positively related to success. Citing a study by Forward and Zander (see Zander, 1971), on a task measuring physical strength, those groups which were led to believe, via a bogus feedback manipulation, that their members were strongly inclined toward group goals (high collective efficacy) outperformed groups which were led to believe that their members were poorly inclined toward group goals (low collective efficacy). While this study provided evidence for a positive relationship between a collective expectation for success and group outcome, it also raises the issue of the importance of how collective efficacy is developed. To this end, if collective efficacy is based on relatively few experiences, as the groups in the Forward and Zander study appear to

have been (Zander 1971), then these groups should be more susceptible to immediate information feedback. On the other hand, collective efficacy derived from many positive or negative experiences ought to be more resilient to immediate feedback manipulations.

Further evidence of this relationship between collective efficacy and performance is cited by Spink (1990). In studies by Felt, Bandura, Albrecht, and Corcoran (1988) and Feltz, Corcoran, and Lirigg (1989), there was found to exist a significant positive relationship between collective efficacy and successful power play percentage in ice hockey. Also, elite volleyball teams who possessed high levels of collective efficacy finished significantly higher in tournament play than teams with low levels of collective efficacy.

In addition to providing evidence of a positive relationship between collective efficacy and group performance, Spink (1990) has also cited evidence to suggest that collective efficacy and self-efficacy are qualitatively different as Bandura (1990) and Carron (1988) had surmised. Regarding coaching strategies, Gould, Hodge, Peterson, and Giannini (1989) revealed that elite coaches utilize different techniques to enhance perceptions of efficacy in individuals and teams. Moreover, it was found that successful team performances correlated more strongly

with team confidence than with the aggregation of individual confidence scores from all members of the team.

Following from this discussion concerning collective efficacy it appears that, to date, no studies have sought to investigate how collective efficacy would impact on the phenomenon of social loafing. While studies have demonstrated that positive perceptions of collective efficacy are related to successful group performances, is this relationship strong enough to help a group achieve its potential performance output as defined by Steiner (1966).

Statement of the problem Examination of the research literature suggests that there are two ways in which the perception of collective efficacy can be developed. First, perceived collective efficacy can be the result of group composition. In this manner, perceived collective efficacy is viewed as an experiential variable which develops from the group members' history of performing together (Spink, 1990). As an experiential variable, perceived collective efficacy develops over time through shared efforts toward maximizing coordination and shared experiences of success. Second, the perception of collective efficacy can be developed as an experimental variable (Zander, 1971). Collective efficacy may be developed through the experimental manipulation of

performance feedback from relatively few shared performance experiences.

In most previous social loafing studies, research has employed the use of ad hoc groups or pseudogroups. In the present study, the investigation of the effect of perceived collective efficacy on social loafing will employ groups and ad hoc groups. Using these two types of groups will allow for the examination of the differential effects of experientially and experimentally developed perceptions of collective efficacy on collective performance. In accordance with the definition of a group, as provided by Alcock, Carment, and Sadava (1988), perceived collective efficacy is developed experientially. On the other hand, the perception of collective efficacy for an ad hoc group can only develop through experimental means. Following from this, it is plausible that the degree to which social loafing occurs will be mediated through the manner in which perceptions of collective efficacy have been developed.

Of further concern in collective performance research is the impact that task salience has on social loafing. Research has shown that tasks which are perceived as interesting or involving by a group, are associated with smaller degrees of social loafing than tasks which are considered unattractive or devoid of meaning by groups (Brickner et al.,

1986; Lichacz & Partington, 1990; Zaccaro, 1984). There has been little, if any, research done to examine the impact of task salience across both groups and ad hoc groups.

The purpose of the present study was to examine how perceived collective efficacy may affect collective performance. Furthermore, this study was designed to examine how collective performance efficiency would be affected by membership in a group or ad hoc group. Finally, although task salience was not directly manipulated in this study, it was interesting to examine how performance may be affected by the fit between group membership and the nature of the task.

The following hypotheses were developed from the literature:

1. Groups performing a task which closely approximates their performance history will provide higher ratings of perceived collective efficacy.
2. Groups and ad hoc groups receiving positive experimental feedback will provide higher ratings of perceived collective efficacy.
3. Groups with different performance histories will respond differently to performance feedback.
4. Collective performance efficiency will be mediated by perceptions of collective efficacy.

Method

Subjects

Twenty-five male Carleton University undergraduate students volunteered to take part in this study for either course credit or \$5. Of these subjects, seven individuals came from the university rowing team. These rowers comprised two groups (as defined by Alcock, Carment, and Sadava, 1988) of three and four members, respectively. Four athletes were members of the university basketball team and constituted two more groups (as defined by Alcock, Carment, and Sadava, 1988) containing two members each. Seven students comprised two ad hoc groups of three and four members, respectively, with prior collective performance experience. Finally, seven students comprised two ad hoc groups of three and four members, respectively, without prior collective performance experience.

Apparatus

A 20 ft. rope (one and one-half inches thick) was attached to a Load Cell which was fastened to a steel girder at a height of three feet, three inches (one meter) (Ingham et al., 1974). The Load Cell was in turn connected to a Vishay/Ellis 20 Digital Strain Indicator that recorded the weight of the pulls in pounds. To ensure that the subjects' feet did

not slip during their pulls, a ladder was placed on the floor so that the rungs could be used as foot-stops. Each subject pulled a three foot intervals (pulling stations) along the ladder.

Testing Materials

A questionnaire was developed to enable subjects to provide subjective ratings and comments according to 0-10 point scales on the following: a) perceived self- and collective efficacy as well as confidence in these ratings; b) salience of the task; and c) comments regarding the effort and effectiveness of their pulling performance.

Concerning the ratings of perceived efficacy, zero was defined as, "no chance of obtaining the best score," and ten as, "will obtain the best score." In order to qualify this question, an additional question was included regarding the confidence of their answer. For this question, zero was defined as, "no confidence at all," and ten was defined as, "100% confidence in my decision."

Subjects were asked about the salience of the task in order to determine whether this kind of performance, rope-pulling, was meaningful to the subjects in some way. That is, did the subjects feel personally involved or personally interested in the task of pulling? To judge this task as salient, this kind of performance had to have been

meaningful in terms of something in the subject's background or present situation. For example, subjects may have been part of a tug-of-war team; perhaps they have done a lot of pulling as in rowing; maybe pulling was/is an integral part of any job they had/have. Here, zero was defined as, "I have no feeling of personal interest or personal involvement in this task," and ten was defined as, "I am very involved in this task, it is meaningful and challenging to me."

Four forms of this questionnaire were developed. One form included space for subjects to comment on their individual pulling effort and effectiveness. A second form was developed to allow subjects to comment on their group's pulling effort and effectiveness. And a third and fourth questionnaire were created to assess both collective and self-efficacy with their respective confidence levels and task salience scales. Finally, all questionnaires provided sections to allow subjects to express what they felt could have been done differently by their group and themselves to increase both collective and self-efficacy and maximize power delivery and group pulling effectiveness.

Research Design and Data Analysis

The design of this study involved a replication of the Ringelmann study (see Ingham et al., 1974). Four groups and four ad hoc groups

were required to pull on a rope both individually and collectively. Using the Load Cell to assess the weight of each pull, the collective pulls and the sum of the respective individual pulls were used to derive a collective performance efficiency index which was used to indicate whether or not social loafing had occurred.

This design also extended the Ringelmann study by examining how variations in perceived efficacy would effect performance efficiency. The first way in which perceived efficacy was represented was through sampling groups with different performance histories relative to the experimental task. Second, perceived efficacy was represented through experimentally manipulating performance feedback during the experimental session. To induce different levels of perceived efficacy, during the experimental session, subjects were given the opportunity to engage in a number of individual and collective pulls, with feedback, to create an experiential base from which to form percepts of collective and self-efficacy (Zander, 1971). Those assigned to the condition of low collective and self-efficacy were given feedback about their pulling performance in comparison to bogus normative standards set by 'high-level athletes'. To induce perceptions of low collective and self-efficacy, the subjects were told that their outputs were 10% below the outputs of

the 'high-level athletes'. After this experiential base of pulling knowledge had been created, the subjects were told that in the study their outputs would be compared to those of the 'high-level athletes'. Then questionnaires regarding their perceived self- and collective efficacy were distributed before their respective individual and group pulls. The same procedure was repeated for those assigned to the condition of high perceived self- and collective efficacy, except that these subjects were given bogus feedback in which their outputs were to be 10% above normative standards set by 'non-athletes'. Following this, the subjects were told that during the study their outputs would be compared to the 'non-athletes'. Then, questionnaires regarding their perceived self- and collective efficacy were distributed before their respective individual and collective pulls. Although these 'objective norms' are entirely bogus, they constitute a critical and necessary part of the study. This perceived efficacy variable has been proven significant in the research literature for mediating individual behaviour (Bandura & Adams, 1977; Bandura, Adams, & Bayer, 1977). The effects of these variations in perceived efficacy were evaluated in terms of the performance efficiency and ratings of perceived efficacy, confidence, and task salience which they were assumed to mediate.

The degree to which social loafing existed for each group was a function of the difference between the collective pulls and the sum of the individual pulls which were determined by the following equation:

$$\frac{\text{group pull}}{\text{sum of individual pulls}} \times 100 = \text{\%}$$

Outcomes were assessed directly by performance outputs in pounds and also in terms of self-ratings of self- and collective efficacy, confidence, task salience, and effort and effectiveness of pulls. Performance efficiency indices were analysed by a 4 x 2 analysis of variance (ANOVA). Performance efficiencies are represented graphically.

A 4 x 2 ANOVA was used to assess the effects of group membership and the experimental manipulation on mediating perceptions of collective and individual efficacy, task salience, and confidence among subjects. Separate One-Way ANOVAs were also used to examine the examine these effects in the respective efficacy conditions.

Procedure

Recruitment and orientation. Students were made aware of this study by reading the recruitment form on the Psychology Department's experimental board. The recruitment form contained a brief description of the task and what was expected of the participants. Also included in

the recruiting form was a section stating that those individuals with any physical ailments who would be susceptible to injury from exertion were not to take part in the study.

The athletes were recruited by way of the experimenter approaching the team captains and providing the same information that the students received from the recruiting form. The captains conveyed this information to their team members and then supplied the experimenter with a list of names and phone numbers of volunteers who were then contacted regarding the time and location of the experiment.

Instructions and testing. Each sample of subjects arrived at the laboratory at different times. When the first group for the study arrived they were escorted into the laboratory, in front of the apparatus. At that time, the participants were given an informed consent form to read and sign (Appendix A). After completing the consent form, the instructor assigned an identification symbol to be used instead of subjects' names to ensure their confidentiality. The instructor assigned a number to each of the subjects which also determined the subjects' pulling position during the collective pulls. Following this, the subjects were given a brief explanation of the apparatus and of what was expected of them during the study.

The instructor then informed the subjects that they would be taking part in a study designed to examine what effects performing a task alone versus performing that same task within a group, in comparison to standardized performance scores, would have on performance output. At this point, the subjects were told that the standard scores were based on performances by either athletes or non-athletes. To investigate this question we had chosen a rope-pull task. The participants' task, as the instructor informed them, was to pull on the rope both individually and collectively as many times as there were members in the group in each respective pulling situation. It was necessary to have so many trials to obtain stable mean scores.

The participants were then told that they would be given a questionnaire prior to their individual and collective pulls to assess perceived self- and collective efficacy (Appendix B & C) and after each individual pulling condition (Appendix D) and after each collective pulling condition (Appendix E) in order to determine the participants' subjective estimates of pulling effort and effectiveness in the different experimental conditions. The time interval between pulling conditions was determined by the length of time it took to distribute, answer, and collect the questionnaires.

To further ensure maximum performance, the instructor informed the subjects that when they pulled on the rope, they would do so while placing their feet on the rungs of the ladder to prevent any slipping during their pulls. The instructor then told the subjects that to avoid any possible confound effects due to performance feedback, exact information about the weight of their pulls would be given at the conclusion of the experiment. Finally, to avoid any audience effects, the experimenter ensured that no unauthorized persons entered the experimental area during the trials.

Next, the instructor explained the specific procedural steps that the subjects were to follow during the study and modelled the correct pulling stance and technique (Appendix F). The same instructions were given for both the individual and collective conditions.

After the instructions and demonstration, the subjects were allowed to engage in two trial pulls individually and collectively. This was undertaken in order to provide the subjects with a 'feel' for the apparatus to ensure maximum performance during the actual trial and to create the experiential base to form perceptions of self- and collective efficacy. Following the trial pulls, the instructor informed the subjects that they would perform an individual pull first, followed by a collective

pull. This pattern would continue until all of the required pulls were obtained. Each subject was told that the order of their performing the individual pulls would depend upon their assigned number. Then a number was called and the instructions commenced.

At the conclusion of the first set of individual pulls and the first questionnaire, the instructor prepared the subjects for the first collective pull. Subjects were told that they were to perform the same task collectively. The assigned number determined their pulling position along the ladder. However, subsequent collective pulls had the subjects pulling from different 'pulling stations'. This was to guard against any order effects that may have occurred otherwise.

At the conclusion of the final questionnaire, the subjects were given a verbal and written debriefing of the experiment (Appendix G). Then, after the subjects' questions had been answered and feedback about their pulls was provided by number identification, the subjects were thanked for their time and effort and were then dismissed. This procedure was followed for all subsequent experimental groups

Results

Hypotheses of this study were evaluated in terms of eight sets of findings: collective and individual pulling performance, ratings of perceived collective and individual efficacy, confidence in predictions regarding subsequent performance, and task salience.

Pulling Performance

Performance findings which bear directly on the research questions of this study are those expressed through collective performance efficiency indexes. Table 3 illustrates the mean collective performance efficiency for each group. A 4 (Group Membership) x 2 (Efficacy Manipulation) analysis of variance (ANOVA) revealed a significant main effect of Group Membership: $F(3, 4) = 27.15$, $p < .001$. Figure 1 illustrates the mean collective performance efficiencies for each group. The Newman-Keuls multiple comparison test revealed that the rowers, performing at 128% of their potential collective pulling ability, demonstrated the greatest collective performance efficiency ($p = .05$). Although the rowers' mean collective performance efficiency differed significantly from the other groups (e.g. basketball players, 96%; ad hoc group with collective performance experience, 94%; ad hoc group without collective performance experience, 91%, the Newman-

Keuls multiple comparison test, with $p = .05$, confirmed that the mean collective performance efficiency of each of these latter three groups did not vary significantly from each other.

Insert Table 3 about here

Insert Figure 1 about here

The mean collective performance efficiency for the groups who received the high efficacy manipulation was 109%, and the mean collective performance efficiency for the groups who received the low efficacy manipulation was 97%. A 4 (Group Membership) x 2 (Efficacy Manipulation) ANOVA indicated a significant main effect for the Efficacy Manipulation, $F(1, 4) = 15.29$, $p = .001$. This finding demonstrates the success of the experimental manipulation to differentially effect collective performance efficiency.

The 4 (Group Membership) x (Efficacy Manipulation) interaction was significant, $F(3, 4) = 4.75$, $p = .01$. Figure 2 illustrates this interaction which demonstrates the importance that utilizing groups, as

defined by Alcock, Carment, and Sadava (1988), and developing feelings of positive efficacy has for facilitating collective performance efficiency. Further analysis with the Newman-Keuls multiple comparison test, with $p = .05$, indicated that the rowers and basketball players were more resilient to the effects of negative information feedback. That is, these groups demonstrated more stable collective performance efficiency in the face of the efficacy manipulations than the ad hoc groups.

Insert Figure 2 about here

Both groups of rowers demonstrated greater collective performance efficiency than the other groups. Additionally, the groups of rowers did not differ significantly from one another, although there is a trend suggesting that the rowers exposed to the low efficacy condition performed more efficiently than the rowers exposed to the high efficacy manipulation. Similarly, the collective performance efficiencies of the two groups of basketball players did not vary significantly from each other. In contrast, the collective performance efficiencies of both sets of high efficacy ad hoc groups, with and without prior collective

performance experience, differed significantly from their respective low efficacy counterparts.

A multiple regression analysis was used to determine which of the variables, Group Membership or Efficacy Manipulation, was the more powerful determinant of collective performance efficiency. This analysis revealed that the variable, Group Membership, accounted for approximately 50% of the variability of the collective performance efficiency data: $r^2 = .49$, $F(1, 23) = 22.14$, $p = .0001$; while the Efficacy Manipulation only accounted for, approximately, another 10% more variability: $r^2 = .59$, $F(1, 23) = 15.87$, $p = .0001$. Thus, the Group Membership variable was the more important determinant of collective performance efficiency in this study.

Table 4 provides the mean absolute pulling performances of the individuals (corrected for unequal group size) for each of the four groups and the efficacy manipulation. The major aspect of these findings is the non-significant main effect for the Efficacy Manipulation. While the data show a trend toward greater individual performances for those individuals receiving the high efficacy manipulation, a 4 (Group Membership) x 2 (Efficacy Manipulation) ANOVA indicated that the

magnitude of this difference was not significant: $F(1, 4) = 1.02$, $p = .34$.

Insert Table 4 about here

Rating Data

Table 5 illustrates the rating data for collective and individual performances. These ratings represent subjective estimates of perceived collective and individual efficacy, confidence in the perceptions of collective and individual efficacy, and perceptions of task salience.

Insert Table 5 about here

Collective Rating Data. The collective rating data were analysed with a 4 x 2 (Group Membership x Efficacy Manipulation) ANOVA. There was a main effect of Group Membership on perceived collective task salience: $F(3, 4) = 6.16$, $p < .01$. Moreover, the Newman-Keuls multiple comparison test showed that although the rowers perceived the rope-pulling task as more salient than the other groups did ($p = .05$), collective task salience did not vary significantly across the other groups.

The results indicated a main effect of Efficacy Manipulation for perceived collective efficacy: $F(1, 4) = 6.25, p < .05$. This finding suggests that the high efficacy experimental manipulation induced those groups receiving this treatment to rate themselves as better able to accomplish the task at hand than those groups who received the low efficacy manipulation.

There was also a significant main effect of Efficacy Manipulation on perceived group confidence: $F(1, 4) = 10.4, p = .01$. Again, those groups receiving the Efficacy Manipulation expressed greater confidence in their perceived efficacy ratings. As can be seen from Table 5, those groups which received the high efficacy manipulation demonstrated greater confidence in their perceived collective efficacy ratings than those groups receiving the low efficacy manipulation.

The results also indicated a main effect of Efficacy Manipulation on Task Salience: $F(1, 4) = 3.00, p = .10$. Those groups which received the high efficacy manipulation reported that the task was significantly more salient to their group than those groups which received the low efficacy manipulation.

Finally, separate One-way ANOVAs were performed to examine the collective rating data for the groups receiving the high efficacy

manipulation and the groups receiving the low efficacy manipulation. Table 6 provides these ratings. Results indicated that the 4 groups receiving the high efficacy manipulation did not differ significantly in regard to their perceived collective efficacy, confidence, and task salience ($p = .67, .60, \text{ and } .22$, respectively). Although the results did show a trend toward the rowers perceiving the pulling task as more salient than did the other three groups.

Insert Table 6 about here

For the groups that received the low efficacy manipulation, there was a significant 1×4 (Perceived Collective Task Salience $\times$ Group Membership) One-way ANOVA: $F(3, 9) = 4.01, p = .05$. This finding suggests that, in the face of the low efficacy manipulation, Group Membership is an important variable in terms of perceived task salience. Although a trend exists which suggests that the rowers perceive this task as more salient than the other 'low efficacy' groups, the Newmann-Keuls multiple comparison test, with $p = .05$, did not reveal any significant differences between these groups. Finally, the 'low efficacy' groups did

not differ significantly in their perceptions of collective efficacy and confidence ($p = .69$ and $.14$, respectively).

Individual Rating Data. As with the collective rating data, the individual rating data were initially analysed with a 4 x 2 (Group Membership x Efficacy Manipulation) ANOVA where the ratings of perceived individual efficacy, confidence, and task salience were the dependent variables. Although the results revealed a non-significant main effect of Group Membership on perceived individual efficacy: $F(3, 4) = 1.83$, $p = .18$, the data did comprise a trend for the rowers expressing a greater degree of perceived individual efficacy than the other 4 groups. This analysis did, however, show a significant main effect of Efficacy Manipulation: $F(1, 4) = 11.45$, $p < .01$. Therefore, individual participants in this study who received the high efficacy manipulation perceived their individual performance abilities to be greater than those perceived by the individuals who performed in low efficacy condition. There was no significant interaction for Group Membership and Efficacy Manipulation, and analysis of perceived individual confidence revealed no main effects nor interaction of Group Membership and Efficacy Manipulation.

There was a significant main effect of Group Membership on perceived individual task salience: $F(3, 24) = 16.46, p < .001$. A Newman-Keuls multiple comparison test further illustrated that the individual rowers gave the highest salience ratings for the pulling task ($p = .05$). Individuals from the remaining three groups did not vary significantly in terms of their task salience ratings.

Further analysis showed a significant main effect of Efficacy Manipulation: $F(1, 24) = 5.26, p < .05$. This finding suggests that those individuals who received the high efficacy manipulation rated the rope-pulling task as more salient than the individuals who had received the low efficacy manipulation. Thus, it appears that the efficacy manipulation in this study differentially effected the way in which individuals perceived the task which they faced. The interaction between Group Membership and Efficacy Manipulation was not significant.

Separate one-way ANOVAs were used to examine differences between the groups within the high efficacy and low efficacy manipulations (see Table 6). These revealed no significant differences between the groups in the high efficacy condition in terms of perceived individual efficacy and confidence ($p = .93$ and $.26$, respectively). However, there was a marginally significant 1×4 (Perceived Individual

Task Salience x Group Membership) one-way ANOVA: $F(3, 11) = 3.87, p = .06$. Although a Newman-Keuls multiple comparison test did not find any significant differences between these groups, there was a trend suggesting that the individual rowers rated the task as more salient than did the other individuals.

Similar findings were obtained from the individuals who received the low efficacy manipulation. One-way ANOVAs revealed no significant differences between the groups in terms of perceived individual efficacy and confidence ratings ($p = .19$ and $.42$, respectively). However, this analysis revealed a significant Individual Task Salience x Group Membership One-way ANOVA: $F(3, 9) = 9.69, p < .01$, suggesting that at the low efficacy manipulation, Group Membership differentially affected the individuals' ratings of task salience. The Newman-Keuls multiple comparison test indicated that individually, the rowers rated the pulling task as more meaningful than did individuals from the other groups. Members from the other three groups did not vary significantly in their task salience ratings ($p = .05$).

Behavioral Observations

After performance feedback was given, behavioral observations were made in order to identify factors which might be helpful for

interpreting the performance and rating data. In particular, it was felt that these observations might reveal performance strategies specific to each group which would help to account for differences in the performance and rating data. As part of this procedure, the experimenter made an attempt to monitor the performance preparation times of the groups and individuals.

With the exception of the ad hoc groups whose members lacked collective performance experience, the remaining groups preferred to initiate their collective pulls on their own mark instead of the instructor's mark. Each group relegated control of initiating the collective pull to the anchor-person of each group pull. It was also the anchor-person's responsibility to ensure that each person was "set" before the collective pull. When the anchor-person was convinced that all members of the group were set to pull, the anchor-person initiated the collective pull by saying either, "1, 2, 3, pull!", or, "ready, set, pull!", at which time group members would pull together until the instructor gave the signal to stop. In contrast, during the individual pulling conditions, all persons waited for the instructor to initiate the pulling task. After each participant had prepared himself for the individual pull, he indicated to

the instructor that he was ready and pulled when the instructor said, "Begin!".

The most impressive pulling performances were provided by the rowers who received the low efficacy condition. Before receiving the performance feedback, there was nothing unique about this group's performance behaviour. On the pre-feedback pulls, these rowers approached the apparatus, took their positions in the pulling stations, then pulled together after the signal to pull was given by the anchor-person. They did not engage in any discussion of strategy, and essentially did not differ from the other groups in terms of behavioral performance. However, after receiving the performance feedback, not only did this group's post-feedback pulling behaviour differ substantially from their pre-feedback pulling performance, but their post-feedback pulling behaviour was unequalled by any of the other groups in this study. Their noteworthy reactions for the negative feedback were apparent in both individual and collective pulling conditions.

In their individual pulling conditions, after receiving the false feedback from the experimenter that they were performing at substandard levels, these rowers appeared to be both amazed and perplexed that they were not performing well on a task so similar to that involved in their

own sport. Their bewilderment in reaction to this negative feedback was summed-up by one of the rowers who said, "I was very surprised that I was under the average, but will try and beat it in the next pull...seeing a negative score is very discouraging...as a rower and varsity athlete, I should outperform the average."

The negative feedback appeared to induce these rowers to perform harder on their subsequent pulls in order to surpass the 'standard pulling level'. On their subsequent individual pulls, each rower appeared very focused during the approximate 12 seconds it took them to prepare for these pulls. In their feedback on the questionnaires, the rowers indicated that the pulling apparatus was different from the training equipment and shells that they were used to performing in. During their 12 second preparation time, they tried to develop a pulling position with which they were more comfortable. The rowers pulled from a crouched position. They said that this position was favourable because it approximated the rowing position that they were used to, enabling them to achieve better leverage when pulling and to use the strength of their legs more effectively. Although this pulling position deviated from that described by the experimenter during the instructions, it was nevertheless permitted

in order to examine the different types of performance strategies utilized by the different types of groups.

Similar behaviours were observed for these rowers in the collective pulling condition. They were again amazed to receive the negative feedback that as a group, they were performing below the standard pulling output. One rower indicated that he was surprised, concerned, and frustrated, that the group was performing below the norm. However, these rowers seemed to transfer this concern and frustration over their poor collective performance into greater efforts on their subsequent collective pulls.

The rowers took about 30 seconds to prepare for each subsequent collective performance. During these pre-pull periods, they engaged in discussions of different pulling techniques to adapt to this style of pulling which, according to them, is a style quite unorthodox to the type of pulling performance that they are use to. The rowers debated different pulling angles; different ways of gripping the rope; and whether they should have all members on one side of the rope when pulling as opposed to trying an even distribution of members on each side of the rope so as to balance the weight for the pull. Remembering that the design of the study had the individual and collective pulls staggered,

during an individual pull, those rowers who were not involved in the individual pull discussed further pulling strategies. They felt that a stronger group performance would be obtained if the anchor-person wrapped the rope around his body when pulling. Finally, each collective pull was preceded by the members encouraging one another to achieve a strong pull.

In contrast, the post-feedback pulling performance of the rowers from the high efficacy condition did not differ from their pre-feedback pulling performance. When this group of rowers received the feedback from the experimenter that they had performed above the standard, they responded in a manner which indicated that was what they expected to hear. In response to the feedback, these rowers appeared calm, cool, and collected. This non-chalant attitude also surfaced in their subsequent individual pulls. During the individual pulling conditions, each of the rowers spent about five seconds of preparation time before each pull. Within this preparatory period, they simply moved to the apparatus, secured a good hold on the rope, and automatically went into a crouch position to pull from when the experimenter said, "Begin!". These rowers appeared unchallenged in the individual pulling condition. This confident attitude was expressed well by one rower from this group who

said that, "From practice, they (the rowers) know the best method (of pulling) and that all they had to do was go for it (pull hard)".

As in the individual pulling condition, these rowers appeared very confident during their collective pulls as well. Again, when they received the feedback that they performed above the standard performance level, they appeared unsurprised. The rowers took approximately ten seconds to ensure that all members were ready; this was overseen by the anchor-person. During this pre-pull period, similar to the individual pulls, the rowers got into their pulling positions quickly. When all members were ready, the 'anchor' gave the signal to pull.

Although these rowers did not appear to show any differences in their preparations for either individual and collective pulling conditions, it was interesting to discover that, from their comments on the questionnaires, these rowers felt that they had performed better as a group than individually because of their past experiences of performing as a crew. Some of the comments from these rowers were: "... (we) work together better than individually (because) we are all used to working together", and "we know we are strong as a group". Furthermore, these rowers indicated that they were inspired to beat the normative collective-pulling standard as reported to them by the

experimenter in order to prove that they were the best at this type of task. As one rower said, "As a group (of rowers) we will want to beat the average collective pull and have the highest average group pull". In contrast, they did not report these kinds of sentiments for the individual condition.

In contrast to the two groups of rowers were the two ad hoc groups that were characterized by a lack of collective performance experience. In both efficacy manipulations and pulling conditions, members from both groups responded to the positive or negative feedback in very similar ways. Members from each group appeared uninterested and uncaring in response to the feedback. That is, when told that they were above or below the normative standard, each participant nodded that he understood and then appeared to wait around for his next pulling condition.

Members of both groups took about five seconds each to prepare for the individual pulls and about ten seconds per collective performance. The most noticeable characteristic shared by both of these groups, which separated them from the other groups, was their neglect to prepare for the collective performances as a unit and to have one member of the group coordinate the group performances. Instead, both groups just

prepared for the group performances, individually and without regard for the other members of their group, and then waited for the instructor to signal them to pull.

In comparison to both groups of rowers who indicated that they were upset with their poor performance and/or said that they wanted to have the best collective performance, these ad hoc groups appeared uninterested in this task. Especially as the study progressed, both groups expressed an inability to perform well due to a lack of motivation. This was inferred from the comments of members of both groups regarding the effort and effectiveness of their pulls. These subjects said that they were either, "losing interest", "lacking motivation", or "losing patience".

Interestingly, although these 2 groups demonstrated different performance efficiencies, one would not be able to tell this by observing their performance behaviours and comments. However, one particular comment by a member of the ad hoc group which received the high efficacy manipulation may hold the answer to why these 2 groups demonstrated different performance efficiencies. When asked on the questionnaire about how interested he thought members of his group were in the task this subject responded, "We waited and were curious to

see how we could do". From this comment we can infer these groups are influenced by performance feedback, as opposed to actual interest.

Both groups of basketball players appeared very similar in all respects of this study. Each group seemed interested and curious in this task, as was indexed by their attentiveness to instructions, their examination of the apparatus, and their constantly asking to find out their actual performance outputs. During the approximate ten seconds that it took each group to prepare for both the individual and collective pulling conditions, each participant did not do more than ensure that they had secure footing and good grip on the rope and then pulled within the position detailed by the experimenter, regardless of efficacy condition. Finally, these basketball players appeared more focused on team achievement than individual performance.

When given the feedback that their individual performances were below the standard output, the basketball players from the low efficacy condition seemed unconcerned. In response to this feedback, one of the basketball players said, "I figure that my size is probably greater than the average person, although I may not be much stronger than the average person". Although this group of basketball players were content that

their individual pulls were above the standard, their comments indicated that they felt awkward performing on this type of apparatus.

In contrast, after receiving the feedback that their collective was performing below the norm, one basketball player from the low efficacy group responded with, "I can't believe that the average group would be any stronger than my group". When asked what their group could have done to achieve a better pull, a member of the same group said that, "While the effort was there, the strategy was not", thus indicating that their unfamiliarity with this task prohibited them from performing better. When the basketball players from the high efficacy condition received the feedback that their collective performance was above the norm, the members of this group responded with comments that indicated a concern for their performance in comparison to other groups. For example, "Being a teammate already with my partner, I felt we were able to achieve a better than average pull" and "(we are) very interested to see how a group of basketball players compare to other athletes and the general public; (we) enjoy the sense of competition". Thus, it appeared as if these basketball players were more conscious of their identity as team of basketball players in a performance setting. This concern was not expressed in the individual pulling conditions.

In a manner similar to the rowers from the high efficacy condition, the members of the ad hoc group with the collective performance oriented background did not appear surprised when they received the feedback that both their individual and collective outputs exceeded the standard performance for this task. The participants indicated that they were very competitive and treated both the individual and collective conditions as tests of their athletic abilities. The competitive nature of this group was evident in the intensity of their individual and collective pulls. During the approximate eight and 12 seconds of preparation for the individual and collective pulls respectively, the participants all maintained serious and intense facial expressions while they adjusted their footing and grip on the rope. During their pulls, these participants pulled very hard as was evidenced by the strain in their bodies, the loud grunts and groans, and heavy breathing when they were finished. Unfortunately, their pulls, both individual and collective, were not smooth, but rather jerky. This may be the reason for their less than perfect pulling efficiency. Although this group did not show overwhelming concern for their collective performances as the high efficacy rowers and basketball players did, this

ad hoc group did indicate a strong competitive nature and desire to have the best performances in both conditions.

The ad hoc group with the performance oriented background that received the low efficacy condition were similar to their high efficacy counterparts. This group spent about five seconds preparing for individual pulls and approximately ten seconds per collective pull. This group indicated a common spirit of competition and desire to have the best performances in each pulling condition. Of interest, however, was this group's reaction of astonishment and disbelief after the feedback that they were not performing as well as the normative standard in both pulling conditions. When this group was told that the feedback was bogus, the members of the group indicated that such a manipulation effected them psychologically. That is, the members of this group felt that the feedback had a detrimental effect on their performances because it weakened their confidence in their performance abilities. Thus, it appears that the experimental manipulation, as reported by this group, was able to effect performance ability from a cognitive level. This suggestion is corroborated by performance data which illustrates a significantly lower collective performance efficiency for this low efficacy ad hoc group as compared to their high efficacy counterpart.

Discussion

Variations in collective efficacy were represented in two ways: first, through sampling groups with different performance histories relative to the experimental task; second, through experimentally manipulating performance feedback during the experimental session. Results indicated that the performance measure of group efficacy was influenced significantly by each factor in the design, but more so by group history than by experimentally manipulated collective efficacy. As will be evident from the discussion below, quite different explanations are required for these two main effects; specifically, a coordination/motivation explanation for the group history factor, and a collective efficacy explanation for the experimental efficacy feedback factor.

Collective Performance Efficiency

Social Loafing Phenomenon. Findings of the present study provide further support for the robust nature of the social loafing phenomenon. Recall that the design provided a replication of the conditions of previous research on social loafing by including ad hoc groups unfamiliar and probably uninterested in the research task. Figure 1 demonstrates that, consistent with previous research on social loafing

(Ingham et al., 1974; Latané et al., 1979), the ad hoc groups used in this study showed actual performance outputs which were below their potential performance outputs. Both ad hoc groups showed performance deficits as reflected by their efficiency indices of 94% and 91%, respectively. Furthermore, the present study has provided additional support for the finding that the social loafing phenomenon is not confined to ad hoc groups only (Lichacz & Partington, 1990). The group of basketball players in this study were not able to achieve their potential performance level. These basketball players performed at only 96% of their potential performance ability. However, the actual performance outputs of the group of rowers exceeded their potential performance output by 28%, thereby eliminating social loafing altogether. Figure 1 reveals that it was the collective performance of the rowers which was responsible for the main effect of group membership.

Group Membership. It was felt that the rowers, in comparison to the other non-rowing groups, would have provided a higher rating of perceived collective efficacy (the group's judgement of the group's capabilities to organize and execute courses of action required to attain designated types of performances) concerning the collective pull because their sport involves pulling together. Following this reasoning, yet to a

lesser extent, the basketball players and the ad hoc group with collective performance experience should have been next in this order in terms of their collective efficacy ratings. Because of their past collective performance experiences, it was assumed that these two groups would have believed that they could have had success with a collective task. Finally, the ad hoc group without collective performance experience should have provided the lowest rating of perceived collective efficacy. Therefore, it was assumed that these differential group experiences would be mediated through feelings of perceived collective efficacy and expressed in their subsequent performances.

However, while these group differences did lead to different collective performance efficiencies in the expected direction, these collective performance efficiencies were not mediated through perceptions of collective efficacy. This was revealed through the analysis of the rating data which revealed no significant differences in the groups' ratings of perceived collective efficacy. Given the simple nature of this task though, it should not be surprising that these groups did not differ significantly in their ratings of perceived collective efficacy. Instead, analysis of the rating data revealed that the rowers provided a significantly higher rating of perceived task salience (feeling personally

involved or personally interested in the task of pulling) than the other groups who did not differ significantly on this rating. Thus, the significant differences in the ratings of task salience, together with the observed pre-feedback pulling behaviours of the groups suggests that the between group differences are understandable in terms of differences in coordination in group pulling due to experience and interest.

The goal of crew members like the rowers in this study is to foster maximum group pulling power. Through their training, rowers learn to develop pulling performance techniques and how to coordinate these techniques for maximum pulling efficiency and effectiveness. As Steiner (1966) has shown, this is a crucial aspect of successful group performance. Furthermore, because this rope-pulling task represented an approximation of the rowers' sport, the rowers' feelings of personal interest and involvement were heightened. The above reasoning is consistent with empirical findings reported by Zaccaro (1984) and Brickner et al. (1986). They demonstrated that personal involvement in a task is an important component for facilitating group performance.

For the non-rowing groups in this study, the rope-pulling task may have been devoid of personal interest and involvement in comparison to the rowers. Consequently, these groups lacked the general task relevant

experience that the rowers share to perform successfully as a group.

This finding appears to be consistent with much of the previous research on social loafing which have employed tasks such as noise production (Latané et al., 1979) and brainstorming (Harkins & Petty, 1982). Like the rope-pulling task in the present study, those previous paradigms were likely devoid of personal interest and involvement for the subjects in those studies.

Efficacy Manipulation. The bogus feedback given to the subjects in this study represented the second way in which collective efficacy can be developed. This type of efficacy development has its origins in Bandura's (1977a) research on self-efficacy in which individual behaviour is mediated through short-term, task specific experiences. In this manner, collective efficacy is developed as an experimental phenomenon. Similar to the group membership condition, it was assumed that the effects of the two levels of the efficacy manipulation would be mediated through feelings of perceived collective efficacy and expressed in the groups' collective performances.

The efficacy manipulations led to different collective performance efficiencies in the expected direction. As shown in Figure 2, those groups that received the high efficacy manipulation demonstrated

significantly greater collective performance efficiency than those groups that received the low efficacy manipulation. Consistent with the assumption of this study, the groups that received the high efficacy condition also provided significantly higher ratings of perceived collective efficacy than those groups that received the low efficacy condition. Furthermore, the groups from the high efficacy condition also generated significantly higher ratings of confidence in their efficacy ratings and perceived task salience. These findings are consistent with the research of Bandura (1982a) and Spink (1990) who have indicated that higher ratings of confidence and collective efficacy are related to higher levels of collective performance efficiency.

These findings suggest that when a group of individuals, whether they constitute a group, as defined in this study, or not, have been led to believe that they have just performed a task well, they are likely to think that on their next try they will again perform well, be confident in this belief, and be likely to feel interested and involved in the task. Thus, it appears that the between efficacy manipulation differences were the result of differential levels of motivation. This account is consistent with previous research (Ingham et al., 1974; Latané et al., 1979) which has advocated that social loafing is mediated by motivational aspects of group

performance. However, these earlier studies have demonstrated that motivational aspects of group membership are largely responsible for social loafing. The present study has demonstrated that motivational variables can lead to the elimination of social loafing.

Group Membership x Efficacy Manipulation Interaction. Figure 3 illustrates the group membership x efficacy manipulation interaction. From Figure 3 it can be seen that the performance patterns of the groups other than the rowers who received the low efficacy condition are explainable in terms of the main effects of this study. However, the substantial deviation from this pattern of performance efficiency by the rowers from the low efficacy condition demonstrates that it was this group who was responsible for this interaction.

For the rowers in the low efficacy condition, the feedback that they received represented a challenge to the rowers' ability to perform well on a rowing-relevant task. However, according to Atkinson's (1964) theory of achievement motivation, reasonable challenges are an important component for enhancing performance. Following from this, these rowers were motivated to work harder in order to overcome their tarnished image of good pullers as implied by the discrepant information in the performance feedback.

One way to account for this incentive to work harder, is to suggest that the discrepant information from the performance feedback created within these rowers a state of cognitive dissonance which they were motivated to eliminate. According to Festinger (1957), cognitive dissonance is said to exist when one cognitive element is logically opposed to another cognitive element. In this case, it was the performance feedback which was dissonant with the rowers' knowledge of their own pulling ability. Thus, it is the psychological discomfort and tension, associated with this state of cognitive dissonance that these rowers were motivated to eliminate, thereby proving that they are the best at this type of task.

There are a number of ways in which these rowers may have eliminated this dissonance. First, these rowers may have changed their attitude toward their group image in order to accommodate the discrepant information contained in the feedback. Second, the rowers could have trivialized the importance of the task as an indicator of their pulling ability. Finally, the rowers could have rationalized their performance so that the performance information matched their performance output. That is, the rowers may have felt that their first try was not a good effort

and therefore decided to try harder on their next pull in order to disprove the performance feedback.

Examination of this group of rowers' rating data and the behavioral observations suggests that they opted for the third manner of reducing this dissonance. Of the groups that received the low efficacy manipulation, the rowers provided the highest rating of collective task salience. Given the definition of task salience, it is very unlikely that these rowers would have lowered their image of themselves as good pullers or trivialized the importance of the rope-pulling task.

This finding, together with the difference between their pre-feedback and post-feedback pulls and their actual performance data, indicate that these rowers were motivated by this discrepant information to perform harder than the other groups in this study.

In contrast, the rowers from the high efficacy condition lacked the dissonance that their low efficacy counterpart experienced and therefore had no incentive to perform harder than need be. Because of the nature of the high efficacy condition, these rowers received feedback that was consistent with their expectations of their abilities. For these rowers, it was no surprise that their performance was above the standard against which they were being compared. Thus, these rowers were not

motivated to change their performance on subsequent pulling situations.

Examination of the behavioral observations confirms this assumption.

Weiner's (1985) research on achievement attributions also affords a possible explanation of this interaction. Attribution theory is a theory of motivation based upon attribution of causality for success and failure. Research on achievement attributions in athletic performance has revealed that when success is consistent with past performances, athletes tend to attribute their success to their ability. In contrast, performance outcomes which are inconsistent with successful past performances tend to be associated with effort (Frieze & Weiner, 1971).

Consistent with the previous work on achievement attributions, it can be assumed that the rowers from the low efficacy condition attributed their performance feedback to an inappropriate level of effort. Such an assumption is based on analyses of the group's rating data and behavioral observations. By providing a high rating of personal involvement and interest in the rope-pulling task and demonstrating an increased intensity on their post-feedback pulling performances, these rowers suggested that they were motivated by a lack of effort during their pre-feedback pulling performance. This explanation makes sense when we consider that,

although it is improbable that an athlete's ability changes from game to game, it is likely that the athlete's effort might fluctuate a great deal.

In contrast, the rowers from the high efficacy condition would have made an ability attribution in light of their performance feedback. Given information that was consistent with their expectations of performance ability on this task, these rowers had no need to try harder on their post-feedback pulls. Examination of the behavioral observations will demonstrate that indeed there was no difference in their pre-performance behaviour between pre-feedback and post-feedback pulls as opposed to the pre-feedback and post-feedback performances of the rowers from the low efficacy condition. The differential achievement attribution between both groups of rowers was found to express itself in performance efficiency. Figure 3 illustrates the greater performance efficiency of the rowers from the low efficacy condition in comparison to the rowers from the high efficacy condition.

Although the findings of this study revealed a significant interaction between group membership and efficacy manipulation, a multiple regression analysis with listwise comparisons showed that the variable, Group Membership, accounted for most of the variance in the performance data. This finding illustrates the importance of the fit

between group membership and the nature of the task for facilitating collective performance efficiency. The behavioral observations showed that the rowing group who had the best pulls spent considerable time planning their coordination strategies. Such pre-pulling behaviour is consistent with their group performance history. Thus, although this study demonstrated the importance of perceived collective efficacy for facilitating collective performance, what is of primary importance for facilitating collective performance efficiency, is to possess the basic task relevant experiences.

Two Factor Model of Collective Performance. The premise of this study was that collective performance efficiency would be mediated through perceptions of collective efficacy. In essence, this represented a single-factor model of collective performance, in which collective performance was mediated by a motivational factor. However, performance and rating trends suggested that a two factor model, representing both motivation and coordination, provided the best fit for understanding the findings of this study.

To recapitulate, the main effect of the efficacy manipulation suggested a motivational explanation for collective performance efficiency. Those groups that received the high efficacy condition (i.e.,

given positive performance feedback) demonstrated a significantly better collective performance efficiency and generated significantly higher ratings of collective efficacy, higher confidence in these ratings, and higher ratings of task salience, than those groups that received the low efficacy condition. In contrast, the significant main effect of group membership suggested a coordination explanation of collective performance efficiency. The main effect of group membership illustrated the importance of coordination of effort based on a common history of general task relevant experiences, and expressed through high ratings of task salience.

Previous research has emphasized either a coordination account (Steiner, 1966, 1972) or a motivation account (Latané et al., 1979) of collective performance efficiency. The findings of this study emphasize the importance of both coordination and motivation as important variables for facilitating collective performance efficiency. When groups possess general task relevant experiences, performance efficiency becomes a matter of coordinating these skills in an optimal manner. The rowers demonstrated that when a group performs a task relevant to their history (i.e., pulling together), a high degree of collective performance efficiency can be achieved without recourse to external motivation such

as positive performance feedback. In fact, the interaction findings show that groups such as the rowers perform very efficiently in the face of negative performance feedback. In contrast, when a group does not possess general task relevant experiences, it appears that collective performance efficiency is best facilitated by providing these groups positive performance feedback. By so doing, it is assumed that the group's motivation to perform on an otherwise meaningless task will remain high enough to assist the group to keep trying to perform well.

Individual Results. Before discussing the implications of these group findings, only a brief discussion of the individual results will be given. The reason for the minor role afforded the individual results is because, although individual performances and ratings were obtained, they were sought mainly to make it possible to generate group performance indices. Group performance was the main focus of this study.

Analysis of the individual performance data revealed a main effect of Group Membership. The fact that there were differences obtained between groups in their aggregate individual performances reflects individual differences in such variables as height, weight, and strength.

These individual differences at the group level are simply the result of sampling.

Although there was not a significant difference between the high and low efficacy conditions at the individual performance level, this can be explained in terms of the nature of the task. In our culture, rope-pulling is more of a group task which is usually experienced in competitive games such as tug-of-war. In this sense, rope-pulling may be perceived as a team sport and unlikely to be sensitive to individual performance; although there was a trend in the expected direction to indicate that the efficacy manipulation was working. This may explain why in this study the experimental manipulation on collective efficacy may have resulted in obtained differences in group pulling performance, whereas the experimental manipulation in individual pulling efficacy did not result in individual pulling differences.

Implications. Research investigating the effects of perceived collective efficacy on group performance is still in its early stages. Consequently, much of the research has employed research designs which are correlational in nature in order to ascertain the relationships between levels of group performance and perceptions of collective efficacy. However, the present study was designed to go beyond this

level of research to provide a direct test of different levels of perceived collective efficacy on the performance efficiencies of different types of groups. As a result, the present research has been able to extend our knowledge of the dynamics of perceived collective efficacy, especially from a developmental standpoint. At a more general level, the present study has been instrumental in adding to our understanding of how groups operate.

The present study has provided support for the findings from previous research which have attempted to explain social loafing in terms of a psychological model. By experimentally manipulating perceptions of collective efficacy through feedback on limited task experiences, this study has demonstrated the importance of a motivational component for eliminating social loafing. However, the significant main effect of group membership found in this study supports the contention of early studies which have emphasized the importance of coordination as the primary mediator of social loafing. Following from this, the results of the present study postulate a two-factor model of social loafing which emphasises the relative importance of both motivational and procedural aspects of group performance. Consequently, future attempts to counter this phenomenon will require a different orientation to this problem.

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Rather than addressing social loafing as a purely psychological phenomenon in terms of the motivational factors experienced by the group, there will have to be at least an equitable amount of emphasis placed on procedural aspects such as task demands and the relationship between the type of group and task involved.

The findings of this study also have important practical implications which extend into the areas of team sports and industry where success is dependent on a coordinated group effort. It is apparent from this research that, when assembling a group of individuals to perform a task, it is of key importance to ensure that this collection of individuals have a high degree of task relevant experience. In so doing, a coach or employer, will be enlisting the services of persons with knowledge of performance strategies necessary for ensuring a successful coordinated effort. With these individuals, it is important to keep these persons together in order to convert an ad hoc group of individuals into a more efficient group.

This study has also made clear that ad hoc groups, in addition to groups, can be made to overcome social loafing. Given that a coach or employer is faced with a collection of individuals with little or no task relevant experience, performance efficiency can be achieved through

positive performance feedback. This positive feedback is important to ensure the motivation necessary to continue to perform and improve when the motivation was probably lacking in the first place. While this feedback has been shown to be instrumental in producing immediate results with this type of group, the possible long term benefit of this positive feedback should be the eventual development of confident and efficacious groups.

Specific to coaching, the findings of this study suggest that there are two different coaching strategies appropriate to different levels of athletic skill. Findings from the efficacy manipulation suggest that at the lower performance skill levels of athletic competition, a more motivational approach to coaching should be taken. That is, it appears that groups which lack general task relevant skills benefit best from positive feedback. Evidence for this comes from Figure 2 which illustrates the superior performance efficiencies of those groups with little to no rope-pulling experience who received the high efficacy condition versus those groups of the same origin that received the low efficacy condition.

For coaches working with high skilled athletes, the findings of this study suggest that the collective performance efficiencies of these athletes

are resilient to immediate information feedback. Following from this, coaches should concentrate on the procedural aspects of the group's performance instead of trying to increase collective productivity through a more emotionally charged strategy of coaching. At this level of athletic performance, athletes have the necessary task relevant experiences and skills and are aware of what they can and cannot do. Relying on a coaching strategy which tries to manipulate these athlete's knowledge of their abilities would be futile. The performance efficiency of the group of rowers from the low efficacy condition demonstrates this point. Of key importance at this level of competition is to allow these groups to coordinate their skills themselves for maximum productivity.

Finally, consider the findings relative to the hypotheses which guided this investigation. First, although it was hypothesized that groups performing a task which closely approximated their performance history would provide higher ratings of perceived collective efficacy, this was not the case. Instead, the group of rowers in this study did not differ significantly from the non-rowing groups in terms of perceived collective efficacy. Second, there was support for the hypothesis that groups and ad hoc groups receiving positive experimental feedback would provide higher ratings of perceived collective efficacy. Third, this study

supported the hypothesis that groups with different performance histories would respond differently to performance feedback. The rowers from both efficacy conditions demonstrated significantly better collective performance indices than the basketball players from each efficacy condition. Finally, there was only partial support for the hypothesis that collective performance efficiency would be mediated by perceptions of collective efficacy. Although perceptions of collective efficacy did appear to mediate collective performance efficiency in the experimental manipulation condition of this study, results suggested that collective performance efficiency was mediated by perceptions of task salience in the experiential manipulation of group membership.

In conclusion, the findings of this study suggest a two factor model of collective performance efficiency which is mediated through coordination and motivation. Moreover, this two factor model demonstrates that social loafing can be attenuated through the use of positive performance feedback, and even reversed when attempts are made to provide a close fit between task demands and group history. This knowledge has important applications for managing groups of people in industry and sports.

References

- Alcock, J. E., Carment, D. W., & Sadava, E. W. (1988). A textbook of Social Psychology. Scarborough: Prentice-Hall.
- Allport, F. H. (1920). The influence of the group upon association and thought. Journal of Experimental Psychology, 3, 159-182.
- Mifflin, C. (1926). Social Psychology. Cambridge, MA: Houghton Mifflin Company.
- Atkinson, J. W. (1964). An introduction to motivation. New York, NY: D. Van Nostrand.
- Bandura, A. (1977a). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.
- Bandura, A. (1977b). Social learning theory. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1981). Self-referent thought: A developmental analysis of self-efficacy. In J. H. Flavell & L. Ross (Eds.), Social cognitive development: Frontiers and possible futures. Cambridge, MA: University Press.
- Bandura, A. (1982a). Self-efficacy mechanism in human agency. American Psychologist, 37, 122-147.

- Bandura, A. (1982b). The self and mechanisms of agency. In J. Suls (Ed.), Psychological perspectives on the self (Vol. 1). Hillsdale, NJ: Erlbaum.
- Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Engelwood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1989). Human agency in social cognitive theory. American Psychologist, 44, 1175-1184.
- Bandura, A., & Adams, N. E. (1977). Analysis of self-efficacy theory of behavioral change. Cognitive Therapy and Research, 1, 287-308.
- Bandura, A., Adams, N. E., & Beyer, J. (1977). Cognitive processes mediating behavioral change. Journal of Personality and Social Psychology, 35, 122-139.
- Bandura, A., Adams, N. E., Hardy, A. B., & Howells, G. N. (1980). Tests of the generality of self-efficacy theory. Cognitive Therapy and Research, 4, 36-66.
- Bandura, A., Reese, L., & Adams, N. E. (1982). Microanalysis of action and fear arousal as a function of differential levels of perceived self-efficacy. Journal of Personality and Social Psychology, 43, 5-21.

- Bandura, A., & Shunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. Journal of Personality and Social Psychology, 41, 586-598.
- Bandura, A. (1990). [Autobiographical talk]
- Barling, J., & Abel, M. (1983). Self-efficacy beliefs and tennis performance. Cognitive Therapy and Research, 7, 265-272.
- Betz, N. E., & Hackett, G. (1981). The relationship between career-related self-efficacy to perceived career options in college women and men. Journal of Counselling Psychology, 28, 399-410.
- Brickner, M. A., Harkins, S. G., & Ostrom, T. M. (1986). Effects of personal involvement: Thought provoking implications for social loafing. Journal of Personality and Social Psychology, 51, 763-769.
- Brody, E. B., Hatfield, B. D., & Spalding, T. W. (1988). Generalization of self-efficacy to a continuum of stressors upon mastery of a high-risk sport skill. Journal of Sport and Exercise Psychology, 10, 32-44.
- Brown, R. (1988). Group processes: Dynamics Within and Between Groups.

- Brown, I. Jr., & Inouye, D. K. (1978). Learned helplessness through modelling: The role of perceived similarity in competence. Journal of Personality and Social Psychology, 36, 900-908.
- Carron, A. V. (1988). Group dynamics in sport. London, Ont: Spodym Publishers.
- Cartwright, D., & Zander, A. (1960). Group dynamics: Research and theory. New York, NY: Harper & Row.
- Chambliss, C. A., & Murray, E. J. (1979). Efficacy attribution, locus of control, and weight loss. Cognitive Therapy and Research, 3, 349-354.
- Cohen, C. J. (1988). Social loafing and personality: The effects of individual differences in collective performances. Dissertation Abstracts International, 49(4), 1430-B-1431-B.
- Conditte, M. M., & Lichenstein, E. (1981). Self-efficacy and relapse in smoking cessation programs. Journal of Consulting and Clinical Psychology, 49, 648-658.
- Cox, R. H. (1985). Sport psychology: Concepts and applications. Dubuque, IO: Wm C. Brown Publishers.
- Dashiell, J. F. (1935). Experimental studies of the influence of social situations on the behaviour of individual human adults. In C.

- Murchinson (Ed.), A handbook of social psychology. Worcester, MA: Clark University Press, 1097-1158.
- Davis, J. H. (1969). Group performance. Reading, MA: Addison-Wesley.
- Faust, W. L. (1959). Group versus individual problem solving. Journal of Abnormal and social Psychology, 59, 68-72.
- Feltz, D. L., Bandura, A., Albrecht, R. R., & Corcoran, J. P. (1988). Perceived team efficacy in collegiate hockey. Psychology of motor behaviour and sport - 1988: Abstracts. North American Society for the Psychology of Sport and Physical Activity.
- Feltz, D. L., Corcoran, J. P., & Lirigg, C. D. (1989). Relationships among team confidence, sport confidence and hockey performance. Psychology of motor behaviour and sport - 1989: Abstracts. North American Society for the Psychology of Sport and Physical Activity.
- Feltz, D. L., Landers, P. M., & Raeder, V. (1979). Enhancing self-efficacy in avoidance tasks: A comparison of modelling techniques. Journal of Sport Psychology, 1, 112-122.
- Feltz, D. L. & Mungo, D. A. (1983). A replication of the path analysis of the causal elements in Bandura's theory of self-efficacy and the

- influence of autonomic perception. Journal of Sport Psychology, 11, 128-140.
- Festinger, L. (1957). A theory of cognitive dissonance. Stanford, CA: Stanford University Press.
- Frank, J. D. (1941). Recent studies of the level of aspiration. Psychological Bulletin, 38, 218-225.
- Frieze, I., Weiner, B. (1971). Cue utilization and attributional judgements for success and failure. Journal of Personality, 39, 591-605.
- Gabrenya, W. K., Wang, Y. E., & Latané, B. (1985). Social loafing on an optimizing task: Cross-cultural differences. In M. H. Segall, P. R. Dasen, J. W. Berry, & Y. H. Poortingor (Eds.), Human behaviour in global perspective: An introduction to cross-cultural psychology. New York, NY: Pergman Press.
- Gauthier, J., & Ladouceur, R. (1981). The influence of self-efficacy reports on performance. Behaviour Therapy, 12, 436-439.
- Geen, R. G. (1991). Social Motivation. Annual Review of Psychology, 42, 377-399.
- Gould, D., Hodge, K., Gianni, J., & Peterson, K. (1989). An explanatory examination of strategies used by elite coaches to

- enhance self-efficacy in athletes. Journal of Sport Psychology, 11, 128-140.
- Gould, D., & Weiss, M. (1981). The effects of model similarity and model talk on self-efficacy and muscular endurance. Journal of Sport Psychology, 3, 17-29.
- Hardy, C. J. (1989). Social loafing: Economizing individual effort during team performance. In L. R. Brawley, A. W. Carron, W. N. Widmeyer, & Hardy, C. J. (Eds.), Group size in physical activity: Psychological and behavioral impacts. Proceedings of the symposium of the North American Society for the Psychology of Sport and Physical Activity, Kent State University, Kent, Ohio.
- Hardy, C. J. (1990). Social loafing: Motivational losses in collective performances. International Journal of Sport Psychology, 21, 305-327.
- Hardy, C. J., & Latané, B. (1988). Social loafing in cheerleading: Effects of team membership and competition. Journal of Sport and Exercise Psychology, 10, 109-114.
- Harkins, S. G. (1987). Social loafing and social facilitation. Journal of Experimental Social Psychology, 23, 1-18.

- Harkins, S. G., & Jackson, J. M. (1985). The role of evaluation in eliminating social loafing. Personality and Social Psychology Bulletin, 11, 457-465.
- Harkins, S. G., Latané, B., & Williams, K. (1980). Social loafing: Allocating effort or taking it easy? Journal of Experimental Social Psychology, 16, 457-465.
- Harkins, S. G., & Petty, R. E. (1982). The effects of task difficulty and task uniqueness on social loafing. Journal of Personality and Social Psychology, 43, 1214-1229.
- Harkins, S. G., & Szymanski, K. (1987). Social loafing and social facilitation: New wine in old bottles. In C. Hendrick (Ed.), Review of Personality and Social Psychology (Vol. 9). Beverly Hills, CA: Sage.
- Huddelston, S., Doody, S., & Ruder, M. K. (1985). The effect of prior knowledge of the social loafing phenomenon on performance in a group. International Journal of Sport Psychology, 16, 176-182.
- Righana, A. (1974). The effect of studies on group size and group performance. Journal of Experimental Social Psychology, 10, 371-384.

Jackson, J. M., & Williams, K. (1985). Social loafing on difficult tasks:

Working collectively can improve performance. Journal of Personality and Social Psychology, 49, 937-942.

Kerr, N. L., & Bruun, S. E. (1981). Ringelmann revisited: Alternative explanations for the social loafing effect. Personality and Social Psychological Bulletin, 7, 224-231.

Kravitz, D. A., & Martin, B. (1986). Ringelmann rediscovered: The original article. Journal of Personality and Social Psychology, 50, 936-941.

Latané, B. (1973). A Theory of Social Impact. St. Louis, MO: Psychonomic Society.

Latané, B. (1981). The psychology of social impact. American Psychologist, 36, 343-356.

Latané, B. (1986). Groups and organizations. San Francisco CA: Jossey-Bass.

Latané, B., & Dabbs, J. (1975). Sex, group size, and helping in three cities. Sociometry, 38, 180-194.

Latané, B., & Darley, J. M. (1968). Group inhibition and bystander intervention in emergencies. Journal of Personality and Social Psychology, 10, 215-221.

- Latané, B., & Darley, J. M. (1970). The unresponsive bystander: Why doesn't he help? New York, NY: Appleton-Century-Crofts.
- Latané, B., & Rodin, J. (1969). A lady in distress: Inhibiting effects of friends on bystander intervention. Journal of Experimental Social Psychology, 5, 189-202.
- Latané, B., Williams, K., & Harkins, S. G. (1979). Many hands make light the work: The causes and consequences of social loafing. Journal of Personality and Social Psychology, 37, 822-832.
- Levine, J. M., & Moreland, R. C. (1990). Small group research. Annual Review of Psychology, 41, 585-634.
- Levy, P., Lundregan, D., Ansel, M., Fell, D., Fink, B., & McGrath, J. (1972). Bystander effect in a demand-without-threat situation. Journal of Personality and Social Psychology, 24, 166-171.
- Lewin, K. (1948). Resolving social conflicts. New York, NY: Harper and Row.
- Lewin, K. (1952). Field theory in social science. New York, NY: Harper and Row.
- Lewin, K., Dembo, T., Festinger, L., & Sears, P. S. (1944). Level of Aspiration. In J. McV. Hunt (Ed.), Personality and behaviour disorders (Vol. 1). New York, NY: The Ronald Press Company.

- Lichacz, F. M., & Partington, J. T. (1990). The effects of group membership, task salience, and identifiability on social loafing.
Unpublished honours thesis, Carleton University, Ottawa.
- Litt, M. D. (1988). Cognitive mediators of stressful experiences: Self-efficacy and perceived control. Cognitive Therapy and Research, 12, 166-171.
- Maier, N. R. F., & Solem, A. R. (1952). The contribution of a discussion leader to the quality of group thinking: The effective use of minority opinions. Human Relations, 5, 277-288.
- Marquart, D. I., (1955). Group problem solving. Journal of Social Psychology, 41, 103-113.
- McAuley, E. (1985). Modelling and self-efficacy: A test of Bandura's model. Journal of Sport Psychology, 7, 283-295.
- McClelland, D. C., Atkinson, J. W., Clark, R. W., & Lowell, E. L. (1953). The achievement motive. New York, NY: Appleton-Century-Crofts.
- Meyers, A. W., Cooke, C. J., Cullen, J., & Liles, L. (1979). Psychological aspects of athletic competitors: A replication across sports. Cognitive Therapy and Research, 1, 361-366.

- Moede, W. (1927). Die richtlinien der leistungs-psychologie [Guidelines of performance psychology]. Industrielle Psychotechnik, 4, 193-209.
- Perlmutter, H. V., & Montmollin, G. (1952). Group learning of nonsense syllables. Journal of Abnormal and social Psychology, 47, 762-769.
- Petty, R. E., & Cacioppo, J. T. (1979). Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. Journal of Personality and Social Psychology, 37, 1915-1926.
- Petty, R. E., Harkins, S. G., & Williams, K. (1980). The effects of group diffusion of cognitive effort on attitudes: An information-processing view. Journal of Personality and Social Psychology, 38, 81-92.
- Petty, R. E., Harkins, S. G., Williams, K., & Latané, B. (1977). The effects of group size on cognitive effort and evaluation. Personality and Social Psychology, 3, 579-582.
- Shaw, M. E. (1932). A comparison of individuals and small groups in the rational solution of complex problems. American Journal of Psychology, 44, 491-504.

- Sheppard, J. A., & Wright, R. A. (1989). Individual contributions to a collective effort: An incentive analysis. Personality and Social Psychology Bulletin, 15, 141-149.
- Slater, M. D. (1989). Social influences and cognitive control as predictors of self-efficacy and eating behaviour. Cognitive Therapy and Behaviour, 13, 231-245.
- Spink, K. S. (1990). Collective efficacy in the sport setting. International Journal of Sport Psychology, 21, 380-395.
- Steiner, I. D. (1966). Models for inferring relationships between group size and potential group productivity. Science, 11, 273-283.
- Steiner, I. D. (1972). Group processes and productivity. New York, NY: Academic Press.
- Szymanski, K., & Harkins, S. G. (1987). Social loafing and self-evaluation with a social standard. Journal of Personality and Social Psychology, 53, 891-897.
- Taylor, D. W., Berry, P. C., & Block, C. H. (1958). Does group participation when using brainstorming facilitate or inhibit creative thinking? Administrative Science Quarterly, 3, 23-47.
- Triplett, N. (1897). the dynamogenic factors in pace-making and competition. American Journal of Psychology, 9, 507-532.

- Ward, C. (1982). Social loafing in Malaysia in the sound production task. Unpublished manuscript.
- Weiner, B. (1985). "Spontaneous" causal thinking. Psychological Bulletin, 97, 74-84.
- Weiner, B., Pandey, & Latané, B. (1981). Individual and group productivity in the United States and India. Paper presented at the annual meeting of the American Psychological Association, Los Angeles, CA.
- Weinberg, R. (1985). Relationship between self-efficacy and cognitive strategies in enhancing endurance performance. International Journal of Sport Psychology, 17, 280-292.
- Weinberg, R., Gould, D., Yukelson, D., & Jackson, A. (1981). The effect of pre-existing and manipulated self-efficacy on a competitive muscular endurance task. Journal of Sport Psychology, 3, 345-354.
- Weinberg, R., Yukelson, D., & Jackson, A. (1980). Effect of public and private efficacy expectations on competitive performance. Journal of Sport Psychology, 2, 340-349.
- Weldon, E., & Gargano, G. M. (1985). Cognitive effort in an additive task group: The effects of shared responsibility on the quality of

- multi- attribute judgements. Organizational Behaviour and Human Decision Processes, 36, 348-361.
- Weldon, E., & Musteri, E. L. (1988). Felt dispensability in groups of coactors: The effects of shared responsibility and explicit anonymity on cognitive effort. Organizational Behaviour and Human Decision Processes, 41, 330-351.
- Williams, K., Harkins, S. G., & Latané, B. (1981). Identifiability as a deterrent to social loafing. Journal of Personality and Social Psychology, 40, 303-311.
- Williams, K., Nida, S. A., Baca, L. D., & Latané, B. (1989). Social loafing and swimming: Effects of identifiability on individual and relay performances of intercollegiate swimmers. Basic and Applied Social Psychology, 10, 73-81.
- Williams, K., Williams, K., Kawana, Y., & Latané, B. (1984). Social loafing in Japan: A developmental cross-cultural study. Paper presented at the annual meeting of the Midwestern Psychological Association, Chicago, IL.
- Zaccaro, R. (1984). Social loafing: The role of task attractiveness. Personality and Social Psychology Bulletin, 10, 99-106.
- Zajonc, R. B. (1965). Social Facilitation. Science, 149, 269-274.

Zander, A. (1971). Motives and goals in groups. New York, NY:

Academic Press.

Ziller, R. C. (1964). Individuation and socialization. Human Relations,

17, 341-360.

Zimbardo, P. G. (1969). the human choice: Individuation, reason, and

order versus deindividuation, impulse, and chaos. In V. J. Arnold

& D. Levine (Eds.), Nebraska Symposium on Motivation. Lincoln:

University of Nebraska Press.

Appendix A

Informed Consent

The purpose of this study is to examine what effects performing a task alone, versus performing that same task within a group task, will have on overall performance output. Subjects will be required to engage in a rope-pulling task. You will be asked to pull on a rope both individually and as part of a group. As well, you will be requested to answer some questions about your performance. Be advised that data about your performance in this study will remain strictly confidential. This will be ensured by using a number rather than your name on your questionnaire. Your participation in this study is voluntary, and previous studies of this kind have not resulted in adverse effects.

You do not need athletic ability, or a sport background to participate in this study, but before you agree to participate, please read the following questions carefully to see if any apply to you. If you answer 'yes' to any of these questions, do not sign up. Otherwise, all male students are welcome to take part.

1. has your doctor ever said you have heart trouble?

2. Do you frequently have pains in your heart and chest?

3. Do you often faint or have spells of severe dizziness?
4. Has your doctor ever said that your blood pressure was too high?
5. Has your doctor ever told you that you have a bone or joint problem such as arthritis that has been aggravated by exercise, or might be made worse with exercise?
6. Is there a good physical reason not mentioned here (e.g.) hernia) why you should not pull on a rope with maximum effort?

I, _____ (please print), having read the instructions and answered the above questions, agree to participate in the experiment.

I understand that I may decline to participate in or to withdraw from the experiment at any time without academic penalty.

Signature:

Date:

49.100 Section:

Appendix B

1. Do you think that you achieve a better pull than the normative pull?

0 1 2 3 4 5 6 7 8 9 10

no chance of obtaining will obtain the the best score
best score

Please explain why:

2. How confident are you in this prediction?

0 1 2 3 4 5 6 7 8 9 10

no confidence 100% confident
at all in prediction

Please explain why:

3. How personally interested and personally involved are you in this task?

0 1 2 3 4 5 6 7 8 9 10

I have no feeling of I am very involved
personal interest/ in this task, it
involvement in this is challenging and
task meaningful to me

Appendix B (cont'd)

Please explain why:

4. Please specify level of athletic achievement in highschool:

low medium high

Detail:

current physical activity: low medium high

Detail:

Appendix C

1. Do you think that your group will achieve a better pull than the normative pull?

0 1 2 3 4 5 6 7 8 9 10

no chance of obtaining

will obtain the

the best score

best score

Please Explain why:

2. How confident is your group in this prediction?

0 1 2 3 4 5 6 7 8 9 10

no confidence

100% confidence

at all

in prediction

Please explain why:

Appendix C (cont'd)

3. How personally interested and personally involved is your group in this task?

0 1 2 3 4 5 6 7 8 9 10

group has no personal

group is very

interest or personal

interested or

involvement in this task

involved in this task

Please explain why:

Appendix D

1. Please explain how much effort you put into your pull and why you gave this amount:

2. Please explain how effective your pull was and why it was this effective:

Appendix E

- 1. Please explain how much effort your group put into the pull and why the group gave this amount:**

- 2. Please explain how effective your group's pull was and why it was this effective:**

- 3. What could your group have done differently to give more effort and to maximize power delivery and group- pulling?**

- 4. Consider yourself, please explain how much effort you put into the group pull and why you gave this amount:**

- 5. Please explain how effective your pull was:**

- 6. What could you have done differently in your group-pull to give more effort and to maximize power delivery and group-pulling effectiveness?**

Appendix F

- 1. 'Take your position':** On this command you are to proceed to a position along the rope. You will be given time to assume the proper pulling position and prepare yourself by securing your grip on the rope and your footing.

- 2. 'Begin':** After this command you will pull on the rope as hard as you can for approximately five seconds, pulling straight back, horizontal to floor, not pulling up or down.

- 3. 'Stop':** Upon hearing this command you will cease to pull on the rope, relax, and move away from the rope until you are required to pull again.

Appendix G

Debriefing

Social loafing is a complex problem that occurs in nearly every aspects of society: industry, team sports, agriculture, providing assistance to others in need. Social loafing refers to the finding that individuals' performance output on a task decreases as the size of the group performing that particular task increases. This study focused on trying to identify variables which may be beneficial in reducing the incidence of social loafing.

To examine social loafing, we had persons participate for whom rope-pulling was a salient task (e.g. rowers) and persons for whom pulling was not salient (e.g. basketball players and university students). Furthermore, this study used members from groups (e.g. rowers and basketball players) and ad hoc groups (e.g. university students) in order to examine the effect of the fit between the nature of the task and group membership on social loafing. Finally, half of the groups in this study received performance feedback which was to induce low and high perceptions of collective efficacy. Collective efficacy refers to the group members' conviction that together they can successfully do what is required for the group to succeed. Those groups assigned to the high

efficacy condition were given bogus performance feedback that they were performing 10% above a standard collective pulling index set by athletes. Those groups assigned to the low efficacy condition were given bogus performance feedback that they were performing 10% below a standard collective performance index set by non-athletes. Then by telling the groups that their performance would be compared against these standard indices, it could then be determined how these manipulations would effect social loafing.

The inclusion of this deception was a necessary and critical part of this study and would not have been included had it been felt unnecessary to the study or that it would have caused any sort of detrimental effects on you. Because this deception is so crucial to this investigation of social loafing, please avoid discussion of your experiences in this study with anyone for the next couple of weeks. This will ensure that all subsequent subjects will be naive to the conditions of this study. Only in this way can we determine whether the perceived collective efficacy is significant to mediating the effects of social loafing.

I would like to thank you for participating in this research. Your time and efforts are greatly appreciated. If you have any questions about this study please feel free to contact Fred Lichacz at 788-2696.

Moreover, if you have any reservations or complaints about the way you were treated in this study please notify any one of the following individuals:

Dr. Partington, Research Advisor; 788-2695

Dr. Herdman, Chair of Ethics Committee; 788-2696

Dr. Jones, Chairman, Dept. of Psychology; 788-2648

Table 1

Results of Individual and Group Conditions in Preliminary Series

Individual	Group	Ratio of	
Individuals	efforts(sum)	effort	group/individual
01-07	764.0	480.0	.628
08-14	516.0	432.0	.837
15-21	533.7	435.4	.815
22-28	575.5	471.2	.818
15-28	1109.2	858.9	.774

Note. These are the data as presented by Kravitz & Martin (1986).

Effort exerted is given in kilograms.

Table 2

Relative Performance as a Function of Group Size

No. of workers	Furnished per worker	Total
<hr/>		
1	1.00	1.00
2	0.93	1.86
3	0.85	2.55
4	0.77	3.08
5	0.70	3.50
6	0.63	3.78
7	0.56	3.92
8	0.49	3.92

Note. These are the data as presented by Kravitz & Martin (1986).

Table 3

Performance Efficiency of Groups as a Function of Efficacy

Manipulation

Efficacy

Manipulation Rowers BBall G.O. NG.O. Mean

High	124	106	104	104	109
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Low	132	86	79	81	97
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Mean	128	96	94	91	
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Note. Efficiency is presented in % of potential performance. BBall = basketball players; G.O. = ad hoc group with collective performance orientation; NG.O. = ad hoc group without collective performance orientation.

Table 4

Individual Pulling Performance as a Function of Group Membership and Efficacy Manipulation

<u>Group Membership</u>			
Rowers	Bball	G.O.	NG.O.
146.1	218.5	166.7	123.0
(26.4)	(21.4)	(36.9)	(14.5)

<u>Efficacy Manipulation</u>	
High	Low
162.7	148.0
(42.4)	(39.9)

Note. Pulling performance is represented in lbs. Bball = basketball players; G.O. = ad hoc group with collective performance experience; NG.O. = ad hoc group without collective performance experience. The numbers within parentheses denote standard deviations.

Table 5

Collective and Individual Ratings of Perceived Efficacy, Confidence, and Task Salience

<u>Collective Ratings</u>						
	<u>Rowers</u>	<u>Bball</u>	<u>G.O.</u>	<u>NG.O.</u>	<u>High</u>	<u>Low</u>
efficacy	7.1	7.5	6.1	6.8	7.5	6.0
confidence	6.7	7.2	5.8	7.5	7.6	5.9
task salience	9.5	7.0	6.4	7.0	8.0	7.2
<u>Individual Ratings</u>						
efficacy	7.6	6.2	5.3	5.7	7.0	5.5
confidence	7.6	5.5	6.8	7.8	7.6	6.8
task salience	9.8	7.0	7.1	7.3	7.5	5.0

Note. Bball = basketball players; G.O. = ad hoc group with collective performance experience; NG.O = ad hoc group without collective performance experience; High = high efficacy condition; Low = low efficacy condition.

Table 6

Collective and Individual Ratings for Perceived Efficacy, Confidence, and Task Salience

	<u>Collective Ratings</u>							
	Rowers		Bball		G.O.		NG.O.	
	High	Low	High	Low	High	Low	High	Low
efficacy	7.7	6.7	8.5	6.5	7.0	5.0	8.3	5.7
confidence	8.7	5.5	7.5	7.0	7.0	4.3	8.3	7.0
task salience	9.6	9.5	7.5	7.0	7.3	5.3	8.0	6.3
	<u>Individual Ratings</u>							
efficacy	8.0	7.7	8.0	5.5	8.0	3.3	7.7	4.7
confidence	8.3	7.0	5.5	5.5	7.7	6.3	8.7	7.3
task salience	10.0	9.7	7.5	6.5	7.5	6.0	7.3	7.3

Note. Bball = basketball players; G.O. = ad hoc group with collective performance experience; NG.O. = ad hoc group without collective performance experience.

Figure Captions

Figure 1. Performance efficiency indexes for the main effect of group membership.

Figure 2. Performance efficiency indexes for the high and low efficacy conditions.

Figure 3. Performance efficiency indexes for the interaction between group membership and efficacy manipulation.

Note. In all figures: Bball = basketball players; ad hoc gp = ad hoc group with collective performance experience; ad hoc ng = ad hoc group without collective performance experience.

Figure 1

Figure 2

Figure 3

END

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FIN