

THE EFFECTS OF SELF EFFICACY AND FEEDBACK UPON PERFORMANCE IN GROUPS

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ABSTRACT

A study was undertaken to investigate firstly, how individual levels of perceived self efficacy affect individual performance in groups and secondly, the influence of self efficacy beliefs and feedback upon social loafing in groups.

The perceived self efficacy of 132 Stage One Psychology students for an anagram solving task, was assessed by questionnaire. Subjects were placed in either high or low self efficacy groups, or by themselves, in order to complete an anagram solving test. Subjects were set a moderately difficult goal and received individual and/or group feedback half way through the task. They then completed the test, whereupon their percentage performance change across both halves of the experiment was measured.

In accordance with the hypotheses, perceived self efficacy contributed to variations in motivation, depending on whether positive or negative feedback was received. The effects noted within individual subjects were considerably stronger for individuals performing within the context of a group. Social loafing only occurred in low self efficacy grouped condition subjects, who received negative feedback. Therefore low self efficacy may be considered a potential moderator of the social loafing effect. The implications of these findings are discussed.

CHAPTER ONE

INTRODUCTION

The maximisation of employee motivation in order to maintain high productivity for the organisation has been of great interest to industrial and organisational psychologists for a number of decades. Researchers have expounded the use of autonomous workgroups which are presumed to have several advantages for employees. One assumption is that teamwork is motivating and results in improved group performance.

While many organisations in a number of countries have been utilising such workgroups in the belief that they increase employee motivation, (eg., Bassin, 1988; Pritchard, Jones, Roth, Steubing & Ekeberg, 1988), a body of literature has been developing concerning the negative consequences which can arise from teamwork. It has been shown that when people work together on a task, they exert less effort than when they work individually on the same task. This phenomenon was noted early this century by Moede (1927) and has been termed "social loafing".

As social loafing results in negative consequences for individuals and organisations, much of the recent group research has been devoted to examining which factors influence its occurrence, and how it can be eliminated. A number of different moderators of social loafing have been

identified over the last decade and the ensuing literature review will give full coverage of these.

While considerable attention has been given to the factors affecting motivation loss in groups, Bandura (1977, 1982, 1986) has proffered the concept of self efficacy as one cognitive factor that greatly influences motivation within an individual. Bandura defined self efficacy as an individual's judgement of his or her capabilities to organise and execute courses of action required to attain designated types of performance (Bandura, 1988, p.391). People of low self efficacy are more likely to give up should their efforts produce negative results, whereas those of high self efficacy will gain increased motivation and try harder. The studies examining self efficacy and motivation loss to date have only concerned individuals working alone on a task.

In light of this, the present study was aimed to investigate whether self efficacy could influence individual performance in groups, and whether self efficacy beliefs impacted upon social loafing in groups. Presently there are no studies which have examined either of these factors.

REVIEW OF THE LITERATURE (PART ONE)

Chapter One of this review covers the literature on social loafing and free riding, while Chapter Two reviews theoretical and empirical studies of the concept of self efficacy.

1. 1 MOTIVATION LOSS IN GROUPS

1.1.1 Social Loafing

For many decades social psychologists have been studying the effects of group membership on individual performance (eg., Allport, 1924; Triplett, 1898; Zajonc, 1965) and the difference between individual and group performance (Hill, 1982; Lorge, Fox, Davitz & Brenner, 1958; Shaw, 1932; Thomas & Fink, 1963).

Studies examining group performance have shown that people exert less effort in a variety of tasks when they work collectively, in comparison with when they work individually on the same task. Researchers have labeled this phenomenon "social loafing". In accordance with Steiner's (1972) discussion, this effect has generally been explained as due to either coordination problems or motivation losses or both.

Social loafing has been characterised as a "social disease" because it has "negative consequences for individuals, social institutions and societies" resulting in "a reduction in human efficiency, which leads to lowered profits and

lowered benefits for all" (Latané, Williams & Harkins, 1979, p.831). Given these potential consequences, it is important to determine exactly what factors underlie the loafing effect, and considerable attention will be given to an examination of these, later in this review.

Contemporary work on social loafing has been stimulated by data attributed to Ringlemann, in Moede (1927), cited in Kravitz and Martin, (1986, p.936). Ingham, Levinger, Graves and Peckham (1974) illustrated the importance of Ringlemann's work for the group performance area in general and for social loafing in particular. These researchers re-examined Ringlemann's classic finding - that the addition of co-workers in a rope pulling task leads to a linear decrement in the individual group member's average performance. Their first study found a curvilinear relationship between group size and individual performance, while their second study demonstrated that declining motivation has a deleterious effect on productivity. However, coordination loss alone was insufficient to account for Ringlemann's findings.

Much more recently, Kravitz and Martin (1986) devote an entire article to the work of Ringlemann, examining the original article in detail, and relating Ringlemann's results to contemporary theory and research. These authors conclude that "Ringlemann's research is most closely linked to the contemporary research on social loafing, which it inspired" (p.940). However, it is noted that one difference between Ringlemann's data and current social loafing results is the shape of the function relating mean individual performance to group size. Whereas current research has obtained a curvilinear relation (Ingham, Levinger, Graves & Peckham, 1974; Latané, Williams & Harkins, 1979), Ringlemann's data exhibited a linear relation. As very little is known

about the conditions under which Ringlemann collected his data, it is not possible to evaluate the later research and theories using this information.

Social loafing has been demonstrated in a wide variety of contexts; firstly on tasks that require physical effort (eg., shouting: Latané, Williams & Harkins, 1979; clapping: Harkins, Latané & Williams, 1980; pumping air into a hand pump or sphygmograph bulb: Kerr & Bruun, 1981).

In one study, (Latané, Williams & Harkins, 1979), undergraduate students wearing blindfolds and earphones were asked to shout as loudly as possible, alone and in pseudogroups of two and six. In pseudogroups, students believed others also yelled, when, in fact, students always shouted alone. When students believed one other person also yelled, subjects produced 82% of their individual effort. In pseudogroups of six, only 74% as much noise was produced. Similar results are found when subjects clap (Harkins, Latané & Williams, 1980) or pump a sphygmograph bulb (Kerr & Bruun, 1981).

Secondly, evidence of reduced cognitive effort also exists (Petty, Harkins & Williams, 1980). Students were asked to list their reactions after viewing the videotape performance of a counseling psychologist. As expected, students working alone generated more thoughts about what they saw than students who believed they shared responsibility for the evaluation task. This has also been demonstrated in other cognitive effort tasks, for example evaluating essays: Petty, Harkins, Williams and Latané, 1977; brainstorming and vigilance: Harkins and Petty, 1982; solving mazes: Jackson and Williams, 1985; a multiattribute judgement task: Weldon and Gargano, 1985 and Weldon and Gargano, 1988. Social loafing has been found to characterise the behaviour of

both males and females (Harkins, Latané & Williams, 1980) and in both between and within subjects designs (Harkins, Latané & Williams, 1980; Kerr & Bruun, 1981).

According to the terminology utilised by Steiner (1972), some of the above tasks have been "maximising" (ie., requiring the participant to put out as much effort as possible, such as rope pulling, shouting, pumping air and brainstorming), while others have been "optimising" (requiring the participant to achieve some criterion performance, such as evaluating essays, vigilance and solving mazes). On the group trials, however, all of these tasks have been additive i.e., the group score has been represented by the sum of the individual efforts. In accordance with Davis's (1969) terminology, these tasks have been "information reducing" (Jackson & Harkins, 1985).

1.1.2 Free Riding

Conceptually similar to the notion of social loafing is free riding, where the free rider profits from the activities of others without making a fair contribution of their own (Weldon & Mustari, 1988). This idea stems from Olson's (1965) theory of rational decision making, cited in Weldon and Mustari, (1988, p.330).

Researchers in the field of organisation behaviour adopt a simple economic explanation and highlight the conceptual similarity of the social loafing and free riding problem in collective action (Albanese & Van Fleet, 1985; Jones, 1984; Weldon & Mustari, 1988). Stroebe and Frey (1982) propose that a group member's decision to free ride results from a comparison of the net expected benefits of contributing to the group's common interest and the net expected

benefits of free riding. Thus the free rider profits from the activities of others without making a fair contribution of his or her own, while the social loafer benefits from group membership but contributes less than his or her best. Loafers and free riders are allowed to benefit because, in each case, the outcome of group performance has the property of a "public good" - the outcome is shared equally by all group members, regardless of their input.

Weldon and Mustari (1988) mention that in the economic model of social loafing the decision to contribute to collective work is considered to be a two step process. The relationship between individual effort and performance is assessed first, while the relationship between performance and reward is considered second. To motivate work, increased effort must lead to increased performance and increased performance must lead to personal gain. Thus, the decision to work depends on some expected return on investment (Edwards, 1961).

Orbell and Dawes (1981) cited in Kerr, (1983, p.819) suggest that free riding is one mechanism that may underlie social dilemmas. These researchers state that there is usually a possibility that some other member of the group can and will provide the public good in social dilemma situations, making one's own contribution unnecessary.

Similarly, when members of a small group see their efforts as dispensable for the group's success, they may reduce those efforts. Kerr and Bruun (1983) empirically demonstrated such free riding motivation losses. They showed that high ability group members worked harder under disjunctive task demands than under conjunctive task demands, whereas the opposite was true for low ability

members. Member motivation was also found to decline as group size increased for disjunctive and conjunctive tasks, even when every member's contribution to the group could be identified. Kerr (1983) suggests that this last finding follows from the free rider logic because as group size increases, the probability increases that someone else in the group will perform better or worse than oneself, and therefore the dispensability of one's effort increases.

Matsui, Kakuyama and Onglatco (1987) examined the possibility of the occurrence of the free rider effect in their study of the effects of feedback upon group performance. The free rider effect was thought to be possible for those subjects whose performance was below target, but group performance and partner's performance was on target. However, there was no evidence of the free rider effect in this study.

1.2 MODERATORS OF SOCIAL LOAFING AND FREE RIDING

1.2.1 Group Size

It has been suggested that social loafing and free riding are correlated with group size (Weldon & Mustari, 1988). Olson's (1965) theory of rational decision making gives two reasons for this correlation. Firstly, increasing group size may be associated with feeling dispensable. As explained by Olson, the contribution of each individual in a small group can have a great impact on group performance and subsequent rewards, as each member's effort constitutes a large part of the total input. However, in large groups the contribution of any particular person seems to be of little consequence, because proportionally, the increase in group performance is small. Thus, the rational actor is expected to

loaf since increased effort produces only a small gain that is shared equally among group members.

Secondly, as group size increases, it becomes increasingly difficult to monitor individual behaviour, and thus individual performance information is lost. This absence of performance information creates two problems for motivation, which are outlined by Weldon and Mustari (1988). First, social control of behaviour is lost because social approval and disapproval cannot be awarded contingent on performance, and second, rewards for performance will probably be equally distributed across group members. Levanthal (1976) noted that an equal distribution of rewards is likely because performance data that might support unequal and more equitable distribution are absent. Therefore, as a result, the free rider loafs, receives an equal share of the group reward, and avoids the cost of social rejection.

Albanese and Van Fleet (1985) also propose that as group size increases, the identification of a member's contribution decreases, making free riding more probable. Further it is easier for a group member to conclude that contributing will make no perceptible difference in the group's provision of its public good. The literature review conducted by these researchers found that free riding and group size are related. However, groups of two to eight members were found to be not large enough for group size effects to work on the free riding choice process.

1.2.2 Dispensability

Increasing group size may be associated with feeling dispensable (Weldon & Mustari, 1988). As mentioned above, in a small group the contribution of each member can have substantial impact on group performance and subsequent rewards, but in a large group the contribution of any person seems inconsequential.

Support for the dispensability dynamic has been found (Kerr & Bruun, 1983; Harkins & Petty, 1982). Kerr and Bruun (1983) studied individual performance in groups facing conjunctive and disjunctive task demands. They showed that capable group members worked hard when group performance was determined by the most successful member's performance and when less capable members loafed. The opposite occurred under conjunctive task demands, suggesting that motivation was influenced by feelings of being dispensable.

In a different experiment, Harkins and Petty (1982) manipulated shared responsibility and showed that feelings of dispensability may grow with the number of coactors involved. Students were required to generate alternative uses for a common object while acting either as a member of a ten person group or alone. Subjects were assigned an easy object or one for which it is difficult to generate multiple uses, in order to manipulate perceived dispensability. Students working on the difficult task were expected to feel that everyone's effort was necessary to produce a satisfactory result, while those in

the easy task groups were expected to feel dispensable, because others were available to produce a simple result.

The results confirmed these expectations. Students who shared responsibility for the easy task produced fewer uses than those working alone, but individuals and grouped subjects faced with the difficult task worked equally hard. After the brainstorming task, self reports were collected and it was discovered that students working on the easy task felt that the same uses would be generated by another person, while difficult object subjects felt that their efforts represented a unique contribution.

Weldon and Mustari (1988) asked subjects to perform a job evaluation task and then respond to questionnaire items measuring attitudes towards the task. It was found that students who shared responsibility for the judgement task with fifteen others felt more dispensable than did students working alone or in pairs. These researchers suggested that feelings of dispensability can be the primary cause of social loafing in some situations.

These findings may help explain the lack of social loafing and free riding effects in the group performance/feedback study conducted by Matsui, Kakuyama and Onglatco (1987). In this study, subjects had to attain a group goal, and therefore may have felt that their efforts were indispensable. Specific group goals and individual goals have been found to minimise dispensability of efforts. However, this study relied on the simplest of groups - two member teams, and previous studies have shown that larger groups cause greater feelings of dispensability within the subjects. Thus, smaller groups may have eliminated the loafing effect.

1.2.3 Identifiability and Anonymity

It has recently been suggested that social loafing may be explained by the anonymity associated with group performance (Weldon & Mustari, 1988). Individual performance is difficult to monitor as group size grows and individual performance information is lost. Group members are free to loaf without fear of social sanction when individual contributions are unknown.

In contrast, the likelihood of the occurrence of social loafing is eliminated by individual identifiability. Williams, Harkins and Latané (1981) demonstrated that shared responsibility along with the unavailability of performance data can account for loafing when students are required to shout. The identifiability and anonymity of individual performance were manipulated in this experiment. In the identifiable condition, students were told that individual performance could be identified and monitored by the experimenter when students shouted alone and in groups.

Students placed in the anonymity condition were told that individual performance could not be identified under either condition. A separate group of students took part in a replication of the earlier social loafing experiment and did not receive any information about whether their performance was anonymous. A significant effect was found for shared responsibility in the replication group, but no social loafing effect in the identifiable or the anonymity treatment groups. Subjects who produced anonymous results loafed while working alone or in groups, while subjects who produced identifiable results worked hard, whether alone or in groups. Thus the authors concluded from

these findings that identifiability of individual inputs was an important mediator of social loafing.

Similar results were found by Kerr and Bruun (1981) and Harkins and Petty (1982), who found that identifiable group members worked harder than anonymous group members on a collective vigilance task. It has been suggested that together these data show that differences in identifiability can explain social loafing in some situations (Bartis, Szymanski & Harkins, 1988).

The importance of the identifiability variable as a critical factor moderating social loafing for individuals has also been propounded by Price (1987). Two laboratory experiments were conducted. The first one found that identifiability had no impact on the degree of cognitive loafing when group members were asked to make a decision, but identifiability did have an impact when group members were asked to express an opinion. The second experiment replicated the findings of the first experiment and also indicated that unidentifiable individuals with sole task responsibility loafed more than unidentifiable individuals who shared task responsibility.

The study by Matsui, Kakuyama and Onglatco (1987) utilised feedback on both group and individual performance, thus allowing identifiability of individual and group efforts to be maximised. If, as is suggested from the results of the studies outlined above, motivation loss is minimised when tasks have increased identifiability, then it is not surprising that social loafing and free riding did not occur in this study, as the two types of feedback given did not allow for any subject anonymity. It must also be remembered that individual efforts of group members in this study were easily identifiable due to the small group size.

More recently, research has suggested that it is not anonymity, but feelings of dispensability that can be the primary cause of social loafing on some tasks (Weldon & Mustari, 1988). It is also suggested that feelings of being necessary can overcome the impact of anonymity on motivation to perform. Studies by Weldon and Gargano (1988) and Weldon and Mustari (1988) found that students who felt their personal efforts were necessary to produce a satisfactory result worked hard in spite of anonymity. These results contradict those obtained by Williams, Harkins and Latané (1981) and Kerr and Bruun (1981), and are interesting because it is suggested that the economic model cannot account for all instances of social loafing. Weldon and Mustari (1988) mention that some other models could account for these results. They believe it is not necessary to generate a new model, as theories of motivation and helping behaviour may be sufficient.

Expectancy models of motivation (Mitchell, 1974) and models of helping behaviour (Hornstein, 1982; cited in Weldon & Mustari, 1988) are similar to the economic model of behaviour in two ways, but are different in another. The connection between increased individual effort and increased performance is a strong determinant of individual effort in each of these models, similar to that in the economic model. Individual subjects must feel that their personal contribution will improve performance, otherwise feelings of being dispensable may lower motivation to perform. These models are also similar because some connection between increased performance and increased gain is required to motivate effort. However, one difference between the models concerns who must benefit. The economic model assumes that personal gain is required to motivate effort, while expectancy models and models of helping behaviour

assume that benefit to others may be sufficient reason to perform. Therefore, two conditions are needed to motivate effort in coacting groups: the individual group member must believe that his or her effort improves group performance, and he or she must believe that improved group performance benefits someone, but not necessarily the self.

Weldon and Mustari (1988) suggest that the reason for the difference between the results lies in the tasks performed and the reasons for doing them. Williams, Harkins and Latané (1981) told students that they were involved in a study of sensory feedback and the production of sound and asked them to shout as loudly as possible. Kerr and Bruun (1981) asked students to pump air into a sphygmograph bulb (hand pump) in a study of the impact of isolation versus visibility of coactors on performance. The undergraduate students in this study worked to avoid disapproval, and thus anonymity produced social loafing.

In contrast, the job evaluation task in the Weldon and Gargano (1985) and Weldon and Mustari (1988) experiments provided students with a different reason to perform. The students felt the task was important, that the information collected could improve student life, and that they held a social responsibility to contribute.

Overall then, anonymity has been found to contribute to social loafing, while identifiability of subjects and their efforts can eliminate its occurrence. The most recent research however, has shown that feelings of dispensability can be the principal cause of social loafing, and may overcome the impact of anonymity on performance.

1.2.4 Accountability and Shared Responsibility

During the 1960's, social psychologists were interested in how groups differ from and influence the decision processes of individuals (Kogan & Wallach, 1964; Wallach & Kogan, 1965, cited in Hollander, 1971, p.395). These researchers showed that the effect of group discussion of various life problems, eg., money, was to encourage the choice of a risky alternative, riskier than the averaging of individual judgements beforehand on the same problems. They termed this phenomenon the "risky shift".

One explanation given by Kogan and Wallach (1964), cited in Hollander, (1971, p.396) to account for the "risky shift" phenomenon was "diffusion of responsibility". This notion contends that the riskier course is easier to take if others are implicated so that responsibility is divided. Little research appears to have followed up this idea, however it may be linked to the findings of recent studies which have examined the effects of accountability and shared responsibility upon social loafing in groups.

Accountability is assumed to raise concerns about social evaluation, so that an individual's interest in appearing thoughtful, logical and industrious overcomes motivation to loaf (Weldon & Gargano, 1988). Janis and Mann (1977) suggest that decision makers who expect to justify their opinions to others will be more likely to perform those difficult cognitive tasks that are regarded as signs of thorough information processing. Similarly, Beach and Mitchell (1978) consider accountability a powerful environmental demand that increases pressure to be correct.

Two important studies have examined the effects of accountability and shared responsibility on cognitive effort in additive groups. Weldon and Gargano (1985) examined whether judges who shared responsibility for a multi-attribute judgement task would exert less cognitive effort than judges bearing sole responsibility for the outcomes. Subjects were led to believe that they were taking part in a study of college student work preferences and evaluated a series of job descriptions. It was found that those who believed that responsibility for the task was shared produced fewer evaluations and used less complex judgement strategies than did individual evaluators.

This study was replicated and extended by Weldon and Gargano (1988). These researchers found that judges who shared responsibility for the judgement task and were unaccountable used less effortful judgement strategies than did judges working alone. Accountability eliminated differences between individual and multiple judges on one measure of cognitive effort. When faced with the prospect of explaining their judgements, multiple judges considered more information, and on this measure, matched the efforts of judges working alone.

While early studies have suggested that people are more likely to choose risky alternatives when responsibility is shared, these later studies have shown that people are more likely to perform more poorly when responsibility for the task is shared by the whole group. Thus shared responsibility can have a debilitating effect, again suggesting that two heads are not always better than one. Accountability for the task has also been shown to discourage cognitive loafing in coacting groups. Little exploration of the moderators of cognitive loafing appears to have been conducted by other researchers, even though Weldon

and Gargano (1988) appear to have provided some valuable insight into how accountability and shared responsibility may affect cognitive effort in groups.

1.2.5 Potential for Evaluation

Some of the later research has shown that loafing cannot be eliminated by identifiability of individual efforts alone (Harkins & Jackson, 1985). Participants must also feel that their outputs can be compared with those of others. Harkins and Jackson (1985) discovered that without the potential for evaluation, participants whose outputs were individually identifiable exerted as little effort as those whose outputs were pooled. These data suggest that people are motivated to work by the potential for evaluation. When outputs are pooled, evaluation is not possible, and according to Szymanski and Harkins (1987), it is this aspect of "working together" that leads to loafing.

The idea that potential for evaluation by some external source can motivate performance is consistent with findings concerning social influence in many areas of social psychological research. Studies of conformity have shown that people conform completely, or in part, because they fear that to do otherwise would result in negative judgements by others (eg., Deutsch & Gerard, 1955). It has also been found in research examining bystander apathy, that people may not help in emergencies, in part because they do not want to appear foolish in front of others (eg., Latané & Darley, 1970, cited in Brickner, Harkins & Ostrom, 1986). Deindividuation research has shown that people become less inhibited and act in ways they normally would not because the presence of others may make them feel anonymous and free from individual evaluation (Diener, 1980).

Within the loafing paradigm, there are three potential sources of evaluation: the experimenter, the coactor(s), and the participant. The role of the experimenter as evaluator has been emphasised in social loafing research. For example Harkins, Williams and Latané (1980) state "the results are easily explained by a minimising strategy where participants are motivated to work only as hard as necessary to gain credit for a good performance or to avoid blame for a bad one. When the experimenter was unable to monitor individuals' outputs directly, performers sloughed off" (p.464).

When the manipulation checks have been utilised, only the participant's perceptions of the experimenter's ability to evaluate individual outputs have been assessed (eg., Harkins & Jackson, 1985; Harkins & Petty, 1982; Jackson & Williams, 1985). However, it also appears that in this research, when the experimenter could not evaluate individual performances, neither could other group members, or the participant. An example of this occurred in Latané, Williams and Harkins (1979). When the participants shouted, no evaluation was possible, due to the masking noise eliminating the possibility that participants could hear or be heard. If the participants had access to the scores after the session it was possible for them to evaluate individual performances, but they could not decompose the group shouts. Therefore, when outputs were pooled, participants may have felt that they could not evaluate their own outputs. Nor could these outputs be evaluated by the other participants.

Szymanski and Harkins (1987) suggest that the motivational efficacy of the potential for self evaluation is particularly interesting, and in two experiments they provided participants with the opportunity to self evaluate, without

attempting to motivate them to do so. These researchers mention that the types of tasks typically used in loafing research are "noncompetitive, boring, and tiring" (Harkins, Latané & Williams, 1980) and that they are unlikely to be personally involving for students, or to provide intrinsic importance, personal meaning or significant consequences for one's life, (Brickner, Harkins & Ostrom, 1987). Thus it is suggested that taking part in these tasks would be "sheer drudgery", and that in the absence of external evaluation pressures, there would be little reason to perform well since the tasks are devoid of inherent interest (Szymanski & Harkins, 1987).

In one experiment, the possibility that the opportunity for self evaluation would be sufficient to motivate performance in the typical loafing paradigm was tested. The task employed in this experiment was the generation of as many uses as possible for an object. It was found that the opportunity for self evaluation was sufficient to lead to performance equivalent to that achieved in the experimenter evaluation conditions. It was discovered that even in a low motivation setting, the opportunity for self evaluation actually provided the participants with two incentives: they could learn something about their abilities on this task, and they could take pleasure in surpassing the performance of the "average" previous participants. Therefore the participants are motivated by the possibilities for self evaluation (learning that they were better than average) and increasing self knowledge (learning about their abilities on the task) or by both of these possibilities.

Implicit in this experiment overall, is that the opportunity for self evaluation may be sufficient to increase motivation. However, it should be noted that in these particular experiments, it was quite likely that the subjects would be performing

the task for the first time, and if they were exposed to repeated trials, the participants may have taken advantage of the opportunity to loaf. Thus, once they had gained knowledge about their competency level for the task, they may not have felt any need to maintain their performance. It is possible though, that small variations in the description of the task (eg., in the use generation task, including comments like "this object may be more difficult to generate uses for than the previous one") may be sufficient to maintain performance levels. Overall, the self evaluation notion may actually have limited value as a method of eliminating social loafing.

Szymanski and Harkins (1987) state that another factor that could affect the motivation to self evaluate is the intrinsic appeal of the task. This means that if the tasks were more interesting, there may be greater motivation to determine one's competency at them. However, the results of a study conducted by Bartis, Szymanski and Harkins (1988) suggest that concern about self evaluation may undermine motivation on tasks that have intrinsic appeal. It was found that participants who were asked to come up with uses that were as creative as possible, generated uses that were more creative when the uses could not be evaluated by anyone, than when they could be evaluated by the experimenter. These findings are consistent with earlier research (Amabile, 1979), which suggests that on interesting, challenging tasks, the possibility of external evaluation undermines intrinsic motivation.

It can be concluded that people gain increased motivation from the knowledge that their efforts can potentially be evaluated either by the experimenter, the self, or by other subjects. More research needs to address the actual value of each of these variables in eliminating social loafing.

1.2.6 Personal Involvement

Most loafing research has involved tasks which have low levels of involvement and which are unlikely to have any future consequences for participants. Some examples include clapping and shouting (Latané, Williams & Harkins, 1979; Williams, Harkins & Latané, 1981), and generating uses for a knife (Harkins & Petty, 1982).

Brickner, Harkins and Ostrom (1986) examined the effects of personal involvement on individual levels of effort in groups. Subjects did not loaf when they thought that they were more likely to be personally affected by the outcomes of their efforts, both when their products were, and were not identifiable. In the low involvement conditions, however, participants were willing to work only when their responses were identifiable. They loafed when they were not. Thus, when intrinsic interest, expected personal consequences, personal meaning or expectations of evaluation of individual effort were absent, participants reduced their efforts.

Brickner, Harkins and Ostrom (1986) suggested that both personal involvement and possibility of evaluation by the experimenter were sources of motivation for the participants. However, they state that either identifiability or involvement alone may be sufficient to motivate participants to work as hard as they can. It is also possible that the potential for external evaluation undermined the effects of personal involvement, as had been found earlier by Daniel and Esser (1980). These researchers found that the use of external rewards undermined intrinsic

motivation for tasks of high interest. For tasks of low interest, intrinsic motivation was unaffected by the use of external rewards.

Overall, the lack of a loafing effect under conditions of high involvement, suggests that increasing levels of personal involvement in group work situations may be useful in increasing productivity. Although Brickner, Harkins and Ostrom (1986) suggest that further consideration of the involvement literature within the loafing paradigm can provide additional insight into issues of group productivity, it appears that no other studies have in fact extended this idea, even though the research could be quite valuable.

1.2.7 Task Difficulty

Another possible mediator of the social loafing effect, is the difficulty of the task. Harkins and Petty (1982) examined the nature of the task and how it impacted upon social loafing. They found that changing the nature of the task could eliminate loafing. Subjects who performed difficult as opposed to easy tasks worked equally hard, whether or not their individual outputs were identifiable. Participants loafed only in easy task - pooled output conditions. Harkins and Petty (1982) suggested that subjects, motivated by the belief that they were of above average capability on the task, did not loaf, since their perceived ability to contribute to the group made their contributions seem more worthwhile. Similar results have been found by Jackson and Williams (1985), however, more recently, very little work appears to have examined the impact of task difficulty upon social loafing in greater depth.

1.2.8 Equity in Effort

A different possible explanation for the loafing effect has been put forward by Jackson and Harkins (1985). It has been suggested that people, when working in groups, expect their coworkers to loaf, and therefore reduce their own efforts to establish an equitable division of labour. Latané, Williams and Harkins (1979) had earlier stated that concern about the extent of partner effort could account for the loafing effect. An inferential process is presumed to exist, whereby participants may arrive at the experiment with the notion that in situations in which responsibility for a task is shared, others attempt to minimise their efforts. Naturally, previous experiences on committees and work groups of other kinds may help manifest this belief.

Jackson and Harkins (1985) found that participants whose original expectations were violated by new information regarding their coworker's intended level of effort, matched their own effort to these new expectations. Participants matched their coworker's level of effort whether or not their individual outputs were identifiable. As with identifiability, holding constant the expectations about partner performance eliminated the loafing effect.

Suggestions are put forward by Jackson and Harkins (1985) about why knowledge about the partner's effort should produce a desire in the participant to match this level. As mentioned above, Latané, Williams and Harkins (1979) suggested an equity explanation, where people match others' efforts because they feel they should do their fair share of the work. Kerr (1983) similarly described his matching results: he suggested that when one's partner is hardly

working, one would be a "sucker" to make up for it by working hard. The idea of a "sucker" effect has had little investigation since it was mentioned by Kerr, and therefore little is really known about its suitability as an explanation for the equity of effort notion. Future research is definitely needed to further explicate the matching effect.

1.3 SUMMARY

This literature review has shown that a current focus of research on individual versus group performance is social loafing, the decrease in individual effort that occurs when the individual works within a cooperative rather than alone. While earlier studies were concerned with explaining the loafing effect itself (Latané, Williams & Harkins, 1979; Kerr, 1983), researchers during the last few years have examined which variables may affect performance in group settings, and in particular, social loafing.

This review has attempted to bring together all the variables which have been discovered to date, and while each plays a central role in producing the reduction in effort that has been termed social loafing, it should be remembered that any number of other variables may affect performance in group settings. None of the variables can account for all motivation losses in groups, or even most, and it is possible that there may be more influential variables yet to be examined empirically.

As noted above, there are several moderators of the loafing effect which warrant a great deal more research before accurate assessments of their potential impact can be formed. Generally however, the extent of the research reveals

that future investigations need to look at how all the factors interact with each other to motivate performance in different settings.

CHAPTER TWO

REVIEW OF THE LITERATURE (PART TWO)

2.1 SELF EFFICACY

2.1.1 Theory

Self efficacy theory (Bandura, 1977) is a social learning approach to the explanation of human behaviour. It argues that people develop "efficacy expectations" concerning their ability to perform specific actions, and that these efficacy expectations determine their level of effort, persistence and success with that activity. Personal efficacy, according to Bandura, is not a passive trait or characteristic, but a dynamic aspect of the self system that interacts in a complex manner with the environment as well as with other motivational and self regulatory mechanisms (eg., outcome expectations), and with personal capabilities and performance accomplishments (Bandura, 1986). Perceived self efficacy is a judgement about personal capabilities that is influenced by and, in turn, influences performance, but is not reducible to objective skills. Rather, as Lent and Hackett (1987) point out, self efficacy determines what we do with the skills we have.

Self efficacy theory has been applied to diverse areas of psychosocial functioning; such as anxiety and phobias (Bandura, 1986) depressive affect (Davies & Yates, 1982) health behaviours (O'Leary, 1985) athletic attainments

(Feltz, 1982) assertiveness (Lee, 1983, 1984) school achievement (Schunk, 1984, 1985) and to career choice (Betz & Hackett, 1981, 1983, 1986; Hackett & Betz, 1981; Lent Brown & Larkin, 1984, 1986; Lent & Hackett, 1987; Lent & Larkin, 1989).

2.1.2 Dimensions of Self Efficacy

Bandura (1977) conceptualised self efficacy as varying along three dimensions: level, or magnitude, strength and generality. Magnitude applies to the level of task difficulty a person believes he or she can attain. Strength refers to the confidence a person has in his or her performance estimates. Brief and Aldag (1981) propose that weak self efficacy expectations are easily modified by disconfirming experiences, whereas strong expectations persist, despite such information. Self efficacy expectations also vary in the degree of their generalisability. Gist (1987) notes that some individual expectations of mastery are task specific, while others extend across a wide variety of situations. Thus, generality of self efficacy concerns the range of situations in which a person considers him or herself efficacious.

Bandura (1982) has specified four principal sources of information through which self efficacy expectations are learned and by which they can be modified. Performance accomplishments are the most influential source of efficacy expectations, as they have been shown to enhance self efficacy more than the other kinds of cues (Bandura, 1977, 1982; Bandura, Adams & Beyer, 1977). As gradual accomplishments build the skills, exposure and coping abilities needed for task performance, mastery is facilitated. However, as Gist (1987) mentions,

some individuals may not allow themselves to be exposed to opportunities for enactive mastery, due to fear or incapacity. Successes have been found to increase self efficacy, while failures tend to decrease self efficacy. Brief and Aldag (1981) also propose that occasional failures, in the face of strong self efficacy expectations can actually strengthen those expectations, if over time it can be shown that such failures are surmountable.

Secondly, vicarious experience (modelling) may be beneficial when enactive mastery is not possible, although Bandura (1977) implies that this is slightly less influential. Bandura, Adams, Hardy and Howells (1980) conclude that modelling is more effective when the models succeed after overcoming difficulty, than when they exhibit good initial performances. It also has better effects when the modelled behaviour produces clear results or consequences and when there is a similarity in age, capability and other personal characteristics, between the subject and the model.

Verbal persuasion is the third source of self efficacy information. This is aimed at convincing a person of his or her capability of performing a task. The effect of this persuasion, however, is a function of the perceived credibility of the persuaders, their expertise, trustworthiness, and so on. Like the aforementioned vicarious sources, verbal persuasion may lead to weak expectations because it does not provide an authentic experiential base (Brief & Aldag, 1981).

The last influence on self efficacy expectations is emotional arousal, where people may partly rely on their state of physiological arousal in judging their capability, strength and vulnerability in relation to stress (Bandura, 1982; Monte 1980, cited in Hall, 1984). High levels of arousal are thought to be detrimental to

performance, and thus individuals are more likely to expect success when they are not tense and anxious. People who judge themselves ineffectual in coping with outside demands tend to generate high emotional arousal and often become excessively preoccupied with personal deficiencies, and believe potential difficulties are more formidable than they are in reality. In such cases, effective use of individual competencies may be undermined, and self regulatory behaviour can occur once more.

Considerable attention has been given to the performance debilitating effects of negative self referent thoughts (Bandura, 1978; Meichenbaum, 1977, cited in Bandura, 1986; Sarason, 1978, cited in Bandura, 1986). Accurate appraisals of one's own capabilities are of great value in successful functioning. Overestimates of efficacy can lead to unnecessary distress or failures, while underestimates are more likely to take self limiting rather than aversive forms. Bandura (1980, 1982) advocates that these individuals usually avoid beneficial environments and activities that would expand their competencies.

2.2 SELF EFFICACY AND TASK PERFORMANCE

Significant correlations between self efficacy and subsequent task performance have been reported in many studies (Bandura, 1982; Bandura & Adams, 1977; Bandura, Adams & Beyer, 1977; Feltz, 1982; Locke, Frederick, Lee & Bobko, 1984; Mento, Cartledge & Locke, 1980). In a review of work motivation theories, Locke and Henne (1986) conclude that the concept of self efficacy seems to be a very powerful one, and the research is very consistent in showing strong relationships between self efficacy and performance.

Self efficacy has also been found to predict subsequent performances better than past behaviour (Bandura, 1977, 1982; Bandura & Adams, 1977; Bandura, Adams & Beyer, 1977; Hardy & Howells, 1980, cited in Bandura, 1986; Chambliss & Murray, 1979). Feltz (1982), however, did not end up with this result, finding instead that as experience with a task increases, past performance may become more predictive than self efficacy. Locke, Frederick, Lee and Bobko (1984) found that if past performance were controlled, self efficacy was a significant predictor of subsequent performance.

Bandura (1982) suggested that self efficacy affects one's choice of settings and activities, as well as skill acquisition, effort expenditure, and the initiation and persistence of coping efforts in the face of obstacles. He outlines that those with higher levels of self efficacy tend to engage more often in task related activities and persist longer in coping efforts, leading to more mastery experiences, thus enhancing self efficacy. Low self efficacy subjects tend to engage in fewer coping efforts and give up easily, evidencing less mastery which reinforces their low self efficacy (Bandura, 1977, 1982; Bandura & Schunk, 1981; Brown & Inouye, 1978). Those who stop prematurely tend to retain persistent low self efficacy, while those who persist tend to gain corrective experiences, which enhance self efficacy.

2.3 SELF EFFICACY AND MOTIVATION

Perceived self efficacy is one cognitive factor that plays an influential role in motivation of the individual. Social learning theory hypothesises that people of low self efficacy will give up readily should their efforts fail to produce results,

but efficacious individuals will intensify their efforts, gaining increased motivation. Bandura (1986) states that it is partly on the basis of self perceptions of efficacy that people choose what challenges to undertake, how much effort to expend in the endeavour, and how long to persevere in the face of difficulties.

It seems likely that the strength of people's perceived capabilities to attain the standards they have been pursuing, will determine whether perceived discrepancies between personal standards and attainments are motivating, or discouraging. People who distrust their capabilities are easily discouraged by failure, whereas those who are highly assured of their efficacy for goal attainment will intensify their efforts if their performance has been poor, and will persevere until they succeed. Evidence supporting the idea that strong beliefs in one's efficacy heightens perseverance in difficult activities has accumulated across a wide variety of areas, for both children and adults (Bandura & Cervone, 1983; Bandura & Cervone, 1986; Cervone & Peak, 1986; Schunk, 1984 and Locke, Motowidlo & Bobko, 1984, cited in Lee & Gillen, 1989).

Self efficacy is considered to provide an integrating mechanism between social learning theory and goal setting approaches to performance (Locke, Frederick, Lee & Bobko, 1984). One goal setting study found that perceived task ability had a significant effect on performance even after controlling all other variables (Mento, Cartledge & Locke, 1980). Another study, which was designed to assess the links between self efficacy, goal level and performance, found that the magnitude of self efficacy was positively related to goal level chosen in two out of three trials and it was positively related to task performance on all trials (Mento et. al., 1980). Strength of self efficacy perceptions was also found to

affect the goal level chosen, the specificity of goals, task performance and goal commitment.

2.4 MOTIVATION AND FEEDBACK

2.4.1 Individual Performance and Feedback

A number of studies have demonstrated the beneficial effects of feedback on individual performance in organisations (Ilgen, Fisher & Taylor, 1979; Ivancevich & McMahon, 1982). A meta analysis by Guzzo, Jette and Katzell (1985) supports these findings. Generally the research on feedback and individual performance indicates that feedback enhances rates of learning, that it affects motivation in a positive direction, that the more specific it is, the greater the impact, and that the greater the delay between performance and feedback, the less the effect (Nadler, 1979). Matsui, Okada and Inoshita (1983) found that when subjects were assigned goals and received feedback half way through their work, the subjects who were on target maintained their previous levels of performance, while those who were below target improved performance significantly. These subjects were also more dissatisfied with their initial feedback than were those who were on target. It is suggested by these findings that a negative goal discrepancy in the comparison process is essential for task feedback to improve performance.

2.4.2 Individual Performance, Feedback and Self Efficacy

It has been noted that feedback is important in formulating efficacy perceptions that interact with goal setting to enhance performance motivation (Bandura &

Cervone, 1983). These researchers found that when subjects were given feedback indicating performance below the level of the assigned goal, subsequent effort was higher for those with high self efficacy than for those with low self efficacy.

Bandura and Cervone (1984), cited in Gist, (1987) found that unfavourable feedback tends to yield negative self evaluations, which led to increased motivation during subsequent performance of the task. In this study, the greatest intensification of effort was observed when both self efficacy and self dissatisfaction, based on negative feedback, were high. Various reactions were observed when feedback indicated that performance fell slightly short of the standard. Some individuals became less motivated, others became demoralised, showing decreased self efficacy and selecting lower goals, while others remained motivated.

Bandura and Cervone (1986) found that perceived self efficacy contributed to motivation across a wide range of discrepancy conditions. The stronger the subject's perceived self efficacy that they could meet a challenging standard, the more they intensified their efforts. Perceived self efficacy operated as a moderator, regardless of whether attainments supposedly fell substantially short of the goal or exceeded it. In this study, subjects who judged themselves highly efficacious of reaching a certain standard, but fell substantially short of it, heightened their efforts markedly. However, the same standard had weak motivating potential for those who doubted their capability to realise it.

Podsakoff and Farh (1989) extend the ideas put forward by Bandura and Cervone (1983, 1984, 1986). While Bandura and Cervone (1983) argue that a

high self efficacy should lead to increased effort on the task and a low self efficacy should lead to reduced effort on the task, Podsakoff and Farh (1989) suggest that when subjects are confronted with negative feedback indicating a performance discrepancy, those who have high ability and high self efficacy improve their performance significantly more than those who have low ability and low self efficacy.

Podsakoff and Farh (1989) also note that the receipt of positive feedback conveys the message that performance is "on target" and the individual is meeting standards. Under these conditions, subjects are expected to feel satisfied with their progress and few changes would be expected to take place in the effort they put forth, especially when they doubt their ability to achieve these goals. These authors recommend that additional research designed to examine the combined effects of feedback, ability and self efficacy on goals and performance should prove valuable.

2.4.3 Group Performance and Feedback

A great deal of the feedback research has focussed on the impact of feedback on individual performance. However some research has been done showing positive effects for groups (Becker, 1978; Chobbar & Wallin, 1984; Emmert, 1978). Nadler (1979) reviewed the literature on group feedback and presented a model which supports the positive effects of group feedback upon performance. More recently, Pritchard, Jones, Roth, Steubing and Ekeberg (1988) reviewed feedback research, again finding support for Nadler's (1979) findings.

Subjects can receive two types of task feedback in group goal setting. One is feedback on their own performance, and the other is feedback on group performance. Matsui, Kakuyama and Onglatco (1987) suggest that one important issue concerning feedback in group goal setting is the mechanisms by which the two types of task feedback affect performance. These authors apply the control systems model to groups by suggesting that if subjects set group and individual goals and receive both group and individual task feedback during the experiment, the comparison process would take place for the two types of feedback. If subjects find a negative goal discrepancy in either process, the model proposes that they would try to minimise it, resulting in improved performance. Subjects would maintain their previous performance levels only if they found no discrepancies in the two comparison processes. These researchers found that task feedback improved performance only for those below target for one or more sources of feedback.

2.4.4 Group Performance, Feedback and Self Efficacy

Even though Bandura (1982) suggested that self efficacy theory can be extended to groups as large as nations, it appears that, to date, there have been no investigations of how individual levels of self efficacy affect individual performance within groups. Neither have there been any investigations of group perceptions of efficacy, and how they are related to group performance. One of the major problems with this research is the lack of an assessment instrument for group efficacy. As stated by Gist (1987), the concept of group efficacy could hold valuable implications for group training and team building. Gist (1987) believes that the concept of group efficacy could also be examined in the

context of organisational change. Resistance to change may sometimes be caused by low efficacy expectations and a fear of failure. Research into group efficacy is needed to determine if efficacy intervention could aid any number of organisational problems.

CHAPTER THREE

RATIONALE FOR THE STUDY

The increased use of autonomous workgroups within organisations has been noted in a number of industrialised countries (Wall, Kemp, Jackson & Clegg, 1986). While the key feature of these workgroups is a high degree of self determination by employees in the management of their day to day work, they are also presumed to have a number of psychological benefits for employees. The underlying assumptions stemming from sociotechnical theory (Davis, 1966; Kelly, 1978) have been that this approach to organising work is intrinsically motivating and enhances employee satisfaction and that from these reactions follow improved group performance and reduced labour turnover. More recently Bassin (1988) has supported this view, expounding the benefits of teams, which include more integration of skills, tapping of unknown member resources, more stimulation, energy and emotional support, more sustained effort at team goals, greater member satisfaction, and higher motivation.

While a number of researchers have been praising the positive psychological benefits of working in teams, others have demonstrated that this can actually contribute to decreased motivation, resulting in social loafing or free riding, both of which can have a deleterious effect on productivity. Eight different moderators of the social loafing and free riding effects, as described in Chapter One, have been discovered by researchers.

At the same time as theories have been developing concerning the causes of motivation loss in groups, the concept of self efficacy has been put forward, primarily by Bandura, as one cognitive factor that greatly influences motivation within an individual. Empirical evidence, as outlined in the earlier literature review, shows that self efficacy acts as a moderator, contributing to motivation, where people of low self efficacy are more likely to lose motivation and give up should their efforts fail to produce results, while those of high self efficacy will gain increased motivation. However, all of the studies to date examining self efficacy and motivation loss have been concerned with individuals working alone, even though it is reasonable to assume that individual self efficacy levels could also affect how one performs within the group context.

The present study is designed to examine (a) how individual levels of perceived self efficacy affect individual performance in groups, and (b) the influence of self efficacy beliefs and feedback upon social loafing in groups and hence determining whether self efficacy can be considered another moderator of the social loafing effect. Previous research, as already shown, has only considered the impact of self efficacy upon task performance at an individual level and not at group level, while at the same time, self efficacy has never been examined as another possible variable associated with free riding and social loafing.

As the self efficacy literature has shown, individual efficacy expectations determine level of effort, persistence and success on a task, with those low in self efficacy giving up most easily. In the present study, it was expected that low self efficacy subjects working by themselves on the task, with an individual goal to attain, would either lose motivation and decrease their efforts, or maintain the

same level of effort, after receiving negative feedback about their performance. However, when subjects with low self efficacy for the task were placed in a group, with a group goal to attain, it was expected that they would be more likely to lose motivation than the individual subjects, and give up easily when they found they were below target, relying instead on the rest of the group's efforts to carry the team through. On the basis of the results obtained, it will then be possible to determine whether self efficacy may be considered another moderator of social loafing and free riding.

3.1 HYPOTHESES

The following hypotheses have been formulated from the evidence taken from the literature reviewed above:

H1: High self efficacy subjects working in the individual condition will increase their level of performance, after receiving negative feedback.

H2: Low self efficacy subjects working in the individual condition will decrease their level of performance, after receiving negative feedback.

H3: High self efficacy and low self efficacy subjects working in the individual condition will decrease their level of performance, after receiving positive feedback.

H4: Low self efficacy subjects working in the grouped condition, whose individual feedback is below target, but group feedback is above target, will display a greater decrease in their level of postfeedback performance than low

self efficacy subjects working in the individual condition, whose feedback is below target.

It was not possible to formulate any more hypotheses about the performance of the grouped condition subjects because of the lack of supportive evidence from the literature.

3.2 IMPLICATIONS

If it is found that self efficacy has a significant effect upon individual performance in a group, and is a potential moderator of social loafing and free riding, then the study will have a number of important organisational implications. These will apply especially to organisations which utilise workgroups, particularly in shop floor work, in the belief that they have an ameliorative effect upon motivation of the individual, and will help increase overall organisational productivity levels.

A positive finding would suggest that managers/supervisors may need to identify those low in self efficacy for a task before being placed in a workgroup. These individuals could be given a different task for which they have higher levels of efficacy, thus maintaining the overall high efficacy and subsequent high productivity level of the group.

Similarly, if group performance is below the expected productivity level, then it is possible, if the hypothesis proves correct, that the problem can be traced to low self efficacy individuals. In this case, low self efficacy individuals within the team could be identified and asked to undergo training sessions utilising enactive mastery and modelling, which have been the most successful methods

for enhancing self efficacy (Bandura & Adams, 1977; Bandura, Adams & Beyer, 1977). After training, hopefully these individuals will contribute more to the group effort, if their self efficacy levels have been sufficiently raised.

A positive finding could also have implications for the selection of employees. As selection of high performing employees is important to organisations, self efficacy levels may be used to predict performance, particularly if employees are required to work cohesively within a group. When selection instruments are used, some assessment of self efficacy for tasks, especially those which are performed by groups, along with a battery of other measures, might be useful in predicting how an individual will perform in a team. It must be noted however, that further research is needed in order to fully address this issue.

3.3 RATIONALE FOR STUDY DESIGN

3.3.1 Student Samples

Undergraduate students have frequently been employed in the experiments of researchers and this has occurred in a great deal of the studies investigating both social loafing and self efficacy. Locke, Frederick, Lee and Bobko (1984), for example, used 209 undergraduates in their assessment of the effects of self efficacy and goals on performance. Simulated tasks in laboratories are frequently used in research, although the findings of these studies do have rather limited generalisability. Locke, Shaw, Saari and Latham (1981) however, note that goal setting studies have generalised quite well from laboratory to field settings.

The current study utilised a student population. As it was possible that the self efficacy levels of university students were higher than those of the general population, a further group consisting of sixth and seventh form students from Ashburton College took part in a preliminary experiment, whereby their self efficacy levels for the experimental task were assessed, and compared with those of stage one and stage two university students. As the self efficacy levels of the university students were actually lower overall than those of college students, then the results of the study could then be extended to the general population (See Table F-1 and Table F-2 in Appendix F and Table G-1 and Table G-2 in Appendix G).

3.3.2 The Experimental Task

A number of the tasks used in self efficacy research have been sex linked, for example, solving mathematical number series, which is viewed as a "male" oriented task. Therefore gender differences are routinely observed when this type of task is investigated (Lenney, 1977). Campbell and Hackett (1986) suggested that the results of studies involving these types of task may be a function of the sex linkage of the task, and they deemed it important to study the effects of successful and unsuccessful performance on a different non sex linked (ie., "gender neutral") task in any future research.

Hackett and Campbell (1987) hypothesised that their use of a verbal anagram task resulted in few differences between men and women because the verbal task could be viewed as a "neutral" or non sex linked task. Therefore, an anagram solving task was employed in the present study, due to its claimed

neutral characteristics. A second reason for utilising an anagram solving task was that students were unlikely to have had much experience at this particular type of activity and so no students would be advantaged. Subjects who had considerable word unscrambling experience were eliminated, as will be detailed in Chapter Five, being asked not to participate in the main experiment.

3.3.3 Measurement of Self Efficacy

Data on task self efficacy are usually collected using the microanalytic strategy advocated by Bandura (1977, 1982; Bandura & Adams, 1977; Bandura, Adams, Hardy & Howells, 1980), where subjects are given a scale presenting increasingly difficult task performance levels, and are instructed to designate those levels at which they expect to be able to perform. This type of assessment has most recently been used by Pond and Hay (1989) who measured self efficacy on 11 five point Likert items.

However, a more simple scale assessing self efficacy for the particular task employed in this study has been developed and used by Hackett and O'Halloran (1985), cited in Campbell & Hackett, (1986); Campbell and Hackett (1986) and Hackett and Campbell (1987). This comprises two items assessing strength and level of task self efficacy. Studies have assessed the reliability of this particular self efficacy measure (Hackett & O'Halloran, 1985, cited in Campbell & Hackett, 1986), and this will be discussed later in this report.

3.4 MAIN EXPERIMENT: CONTROL OF MODERATING VARIABLES

Careful consideration was given to the factors moderating social loafing and free riding in the present study, and efforts were made to lessen the likelihood of each acting as a possible cause of social loafing or free riding. This was done in the following ways:

3.4.1 Group Size

A group size of ten was chosen, as this was considered to be fairly representative of workteam size in the outside environment. However, large group size is correlated with social loafing and free riding, and as Albanese and Van Fleet (1985) found, groups of two to eight members were not large enough for group size effects to work on the free riding choice process.

3.4.2 Dispensability, Identifiability and Anonymity

As large group size is associated with feeling dispensable, efforts were made in this study to make subjects feel that they were indispensable to the successful completion of the task. In order to achieve this, subjects were given specific individual and group goals to attain.

Anonymity due to lack of knowledge of individual contributions can influence social loafing in large groups and thus the efforts of subjects in this study were made identifiable to each subject individually, and to the experimenter, through

feedback. Therefore, any loafing found in this study could not be attributed to the anonymity of subjects.

3.4.3 Accountability and Shared Responsibility

Subjects were placed in relatively tight circles during the experiment in this study, so that each person could feel they were being appraised by their coactors, and thus feel accountable for their own outputs. Even though subjects did share responsibility for the attainment of the team goal, which can have a debilitating effect on individual performance, subjects also worked alone to achieve an individual goal and this should have eliminated this factor as a mediator of the loafing effect.

3.4.4 Potential for Evaluation

The potential for evaluation by some external source can motivate performance and a great deal of research has shown that potential for experimenter evaluation and self evaluation in particular, greatly minimise the likelihood of social loafing occurring. The present study was specifically designed for maximum self and experimenter evaluation, where feedback was given at the midway point of the experiment, both to the individual about his or her own efforts and to the group about their combined performance.

3.4.5 Personal Involvement

Tasks which are unlikely to have any future consequences for participants are more likely to elicit loafing. The task in this study, solving anagrams, was rather

unlikely to be personally involving. However, research has shown that identifiability of effort or personal involvement on their own may be sufficient to motivate participants to work as hard as they can (Brickner, Harkins & Ostrom, 1986). As identifiability of individual efforts was high in the present study, this was presumed to overcome any motivation losses caused by lack of personal involvement with the task.

3.4.6 Task Difficulty

Loafing is most likely to occur when tasks are easy. However little research has examined the impact of task difficulty on social loafing in much depth. An anagram solving task was employed in the present research, and it was expected that most subjects would perceive the task to be of average difficulty. Although some subjects could have found the task easy, this factor is unlikely to contribute greatly to any social loafing that may occur.

3.4.7 Equity in Effort

Experimental participants have been found to match their coworkers' level of effort, whether or not their individual outputs are identifiable. In the present research, individual condition subjects were given feedback about their own performance only at the midway point of the experiment. Grouped subjects were given feedback about their own performance as well as false feedback about the efforts of the group as a whole, at the midway point of the experiment. Subjects were led to believe that the team was on target, thus indicating that most individual team members were on target as well. Reducing effort to match

the level of coworkers is therefore quite unlikely to be a moderator of any social loafing effect found in this study.

3.4.8 Effectiveness of Manipulations and Controls

It can only be presumed that these controls were effective, as no independent measures were taken during the course of the experiment. The significance of this problem will be discussed in the limitations of the study, in Chapter Seven.

3.4.9 Overview of the Following Chapters

It was necessary to divide this study into two separate experiments. This report firstly presents the method and results of the preliminary experiment, followed by a discussion of the significance of these results for the main experiment. The method and results of the main experiment are then presented, followed by a discussion of the results of this experiment, and the implications that these results may have.

CHAPTER FOUR

PRELIMINARY EXPERIMENT

4.1 METHOD

4.1.1 Overview

It was necessary to conduct a preliminary experiment in order to assess the impact of four factors which could have affected the results of the main experiment. These were:

(1) the correlation of self efficacy and performance, as it was necessary to check that ability for doing the task was not confounded by self efficacy,

(2) the correlation between self efficacy strength and self efficacy level, in order to assess the strength of the relationship between the two,

(3) the impact of past performance upon perceived levels of self efficacy, and,

(4) the mean self efficacy strength and level scores of university students as compared to college students. It was necessary to check that the scores of the university students were not above those of the college students, who were considered to be more representative of the general population.

4.1.2 Subjects

Three groups of subjects were involved in the preliminary experiment. The first sample comprised 28 male and 31 female Stage One Psychology students, while the second sample comprised 21 male and 34 female Stage Two Psychology students, all from the University of Canterbury. The third sample comprised 29 male and 28 female sixth and seventh form students from Ashburton College. (Sixth form $n=19$, 11 male, 8 female; Seventh form $n=38$, 18 male, 20 female).

Ashburton College was chosen for the college student sample because the researcher was acquainted with the Deputy Principal of the school, and could therefore easily gain access to a large sample of pupils. It was also considered that this school would not have been approached very frequently in the past by university research students, unlike a number of Christchurch secondary schools. It is recognised however, that the school sample may have been biased due to the rural nature of the surrounding community.

Each subject in the three groups completed the Self Efficacy Questionnaire (Appendix A) and after handing in the completed form, was asked to complete an anagram solving test for five minutes.

4.1.3 The Research Instruments

The two research instruments were:

1. The Self Efficacy Questionnaire (Appendix A).

The Self Efficacy Questionnaire (Hackett & O'Halloran, 1985, cited in Campbell & Hackett, 1986) was originally designed to measure individual strength and level of career self efficacy ratings. Since this study, it has been applied to self assessments of mathematical ability, in a number series solving task by Campbell and Hackett (1986) and of verbal ability, in an anagram solving task by Hackett and Campbell (1987). Reliability data for this scale are given below, but no validation of the scale appears to have been carried out to date.

Previous research has noted that obtaining specific estimates of the reliability and validity of the task-specific self efficacy instrument is difficult, as evidenced by the fact that such psychometric information is rarely provided by self efficacy researchers (Pond & Hay, 1989). These authors suggest that many of the researchers believe that, in the case of task specific self efficacy, such information is not necessary. For instance, Bandura (1978) has questioned whether simple efficacy judgements should "be burdened with construct, trait convergent, and discriminant validation" (p.246).

Individual ratings of strength and level of task self efficacy were obtained via a two item scale, which was used by Hackett and Campbell (1987). Hackett and O'Halloran (1985), cited in Campbell and Hackett, (1986) conducted a study examining the reliability of various efficacy measures, including the two item scale measuring self efficacy, which was used in this study. These researchers found the test-retest reliabilities of the self efficacy level and strength ratings over a one week period to be 0.55 and 0.70 respectively.

Self efficacy strength was assessed by asking subjects to rate their confidence in completing an anagram test (solve 30 anagrams in five minutes) on a scale ranging from not very confident at all (0) to very confident (9). Self efficacy level was assessed by asking subjects to estimate the number of anagrams they expected to solve successfully in five minutes (0) - (50).

2. The Five Minute Anagram Solving Test (Appendix B)

The verbal task employed in this study consisted of a set of fifty disarranged words, or anagrams, that subjects were asked to unscramble. The anagrams in the test were all common five letter English nouns, selected by the experimenter.

In order to assess the difficulty level of these anagrams, one list of 50 anagrams was given to a group of 10 Psychology masters students at the University of Canterbury, while another list of 50 different anagrams was given to a separate group of 10 Masters students. These subjects were all given five minutes to complete as many anagrams as they could. Any anagrams which were not answered by more than half of the subjects in the group were then eliminated, and one list of 50 anagrams of similar difficulty was formed. This list was then named the Five Minute Anagram Solving Test (Appendix B).

The instructions on the front of the test were as follows:

An anagram is a series of letters which can be unscrambled to form a word.

This is an example of an anagram:

EXAMPLE: DGEIR

ANSWER: RIDGE

All anagrams in this test are common five letter words which have a nature theme.

Please unscramble as many words as you can in the time given.

Please write your answer beside each anagram.

They may be completed in any order.

4.1.4 Procedure

The same experimental procedure was used for each of the three samples.

Data were collected from the university student population during laboratory sessions between 19-23 June, just before the mid point of the university year. The researcher attended two Stage One and two Stage Two Psychology laboratory groups during the course of that week. Data were collected from the school group on 27 June, just before the mid term break. A group of sixth and seventh formers from Ashburton College were gathered into the school auditorium for half a period, under the supervision of two teachers. The researcher explained a little about the purpose of the research, and asked students to participate voluntarily in the study. The subjects were instructed on how to complete the questionnaire, these instructions were uniform over the four university groups and the school group.

After a general introduction from the Teaching Fellow in the laboratory groups, and from the supervisory teacher in the school group, the researcher said the following:

" I am studying for an M.A in Industrial and Organisational Psychology, and am currently doing my thesis which is looking specifically at group motivation. I would really appreciate it if members of this class would fill in a very short questionnaire for me, and then complete a five minute test. Please note however, that participation in this experiment is voluntary. When you receive the questionnaire, please put a code name on the top, not your real name, as I want your answers to remain anonymous. It is necessary for you to remember this code name as you will be required to put it on the top of the test sheet also. Please do not talk to anyone about your answers, and when you have finished please hand the questionnaire back in. Thank you very much for your cooperation".

Subjects were required to write a code name on their questionnaires as subject identification was necessary for the researcher to match the test scores with the self efficacy scores.

When the entire class was finished, the anagram test was handed out, every second subject was given a slightly rearranged test, in order to eliminate the possibility of subjects copying from each other. The following instructions were given:

" This is an anagram test which will last five minutes. Please do not turn over until you are told to. Please read through the instructions on the front page, and enter your code name, which is the same as on the questionnaire you have just completed, in the space provided. Remember that you do not have to complete the anagrams in the order that they are given. You may now begin."

The students were given five minutes in which to complete as many anagrams as possible, and were asked to stop at the end of this time, and hand in their tests.

The experimenter then thanked the subjects for their participation, and the Stage One and Stage Two Psychology students were told that the experimenter would return to each laboratory class and verbally give an explanation of the experiment and the results of the entire study, after the completion of the experimental analysis. They were also told that their individual results would be available to them at this time.

After the completion of the test, the experimenter explained to the high school students exactly what the experiment that they took part in was, and why it was necessary to test a group from the general population. The entire study was also explained to these students and examples were given of how the results could be applied to their everyday work at school, if the hypothesis was proven correct. The students were then thanked for their participation and told that their individual results would be available to them from the teacher in charge at the end of the experimental analysis. ie., approximately October. They were also

told that these would be accompanied by a written explanation of the results of the entire study.

4.2 RESULTS

Four analyses of the data were carried out in the preliminary experiment. Firstly, the product moment correlation between self efficacy strength and level, was determined. Secondly, the product moment correlations between self efficacy strength and performance and self efficacy level and performance were measured in order to assess whether self efficacy was confounded by ability for doing the task. Following this, a one factor Analysis of Variance performed on perceived self efficacy and previous educational attainment assessed whether past performance had any affect on self efficacy beliefs. Finally, a one factor Analysis of Variance assessed whether stage of education affected perceived self efficacy level for the task. This was carried out to determine whether university students had a higher level of perceived self efficacy than non-university subjects.

4.2.1 Correlation Between Self Efficacy Strength and Self Efficacy Level

Table 1. Correlation of Self Efficacy Strength and Self Efficacy Level¹

| Count | Covariance | Correlation | R-Squared |
|-------|------------|-------------|-----------|
| 114 | 9.31 | 0.652 | 0.426 |

The correlation coefficient between self efficacy strength and self efficacy level for all subjects is presented in Table 1. Self efficacy strength was significantly correlated with self efficacy level, ($r=0.65$).

4.2.2 Correlation Between Self Efficacy Strength, Self Efficacy Level and Performance

Table 2. Correlation of Self Efficacy Strength and Performance²

| Count | Covariance | Correlation | R-Squared |
|-------|------------|-------------|-----------|
| 87 | 3.478 | 0.266 | 0.071 |

Table 3. Correlation of Self Efficacy Level and Performance³

| Count | Covariance | Correlation | R-Squared |
|-------|------------|-------------|-----------|
| 87 | 15.69 | 0.245 | 0.06 |

¹Calculated on Statview 512 on a Macintosh computer.

²Calculated on Statview 512 on a Macintosh computer.

³Calculated on Statview 512 on a Macintosh computer.

The correlation coefficients between self efficacy strength and performance and self efficacy level and performance are presented in Table 2 and Table 3. Both self efficacy strength or level were weakly correlated with performance ($r=0.26$ and $r=0.245$ respectively).

4.2.3 The Effect of Past Performance on Perceived Self Efficacy Strength⁴ and Level⁵

For self efficacy strength, the mean is significantly lower for subjects with lower educational achievements (U.E. or 6th Form Certificate, $x=3.31$) than for subjects with higher educational achievements (an A or B bursary, $x=4.01$ or university points, $x=5.3$); $F(2,114) = 5.25, p \leq 0.05$

For self efficacy level, the mean is not significantly lower for subjects with lower educational achievements (U.E or 6th Form Certificate, $x=19.15$) than for subjects with higher educational achievements (an A or B bursary, $x=20.42$, or university points, $x=23.3$); $F(2,114) = 1.04, n.s.$

⁴See Appendix D for ANOVA table and table of means and standard deviations.

⁵See Appendix E for ANOVA table and table of means and standard deviations.

4.2.4 The Effect of Year of Education On Perceived Self Efficacy Strength⁶ and Level⁷

The mean self efficacy strength score of Stage One university students ($\bar{x}=3.76$) is significantly lower than that of sixth and seventh form college students ($\bar{x}=4.49$); $F(2,168) = 5.713, p \leq 0.01$

The mean self efficacy level score of Stage One university students ($\bar{x}=20.25$) is significantly lower than that of sixth and seventh form college students ($\bar{x}=23.19$); $F(2,168) = 4.32, p \leq 0.05$.

⁶See Appendix F for ANOVA table and table of means and standard deviations.

⁷See Appendix G for ANOVA table and table of means and standard deviations.

4.3 DISCUSSION

This section will discuss the results of each of the analyses outlined above, and will detail the significance of these for the design of the main experiment.

4.3.1 The Correlation Between Self Efficacy Strength and Self Efficacy Level

This study reported a moderately high correlation between self efficacy strength and self efficacy level, ($r=0.65$). Previous research utilising these measures has found a slightly higher correlation between the two variables, however a mathematical task, rather than a verbal task was used in these studies. Campbell and Hackett (1986) reported a relatively high correlation ($r=0.80$) between their measures of self efficacy strength and level for a mathematics task, and more recently, Matsui, Ikeda and Ohnishi (1989) reported a similar level of correlation ($r=0.77$) between their measures of self efficacy strength and level, also for a mathematics task. Therefore, the correlation obtained in this study was slightly lower than was expected.

4.3.2 The Correlation Between Self Efficacy Strength, Self Efficacy Level and Performance

It was necessary to ensure that the subjects' strength and level of self efficacy was not confounded by the ability for doing the task. The results showed that there was a very weak correlation between both self efficacy strength and performance, and self efficacy level and performance. Therefore it was concluded that the measures of self efficacy could be used satisfactorily in the

main experiment, in the knowledge that they were not confounded by the ability for doing the task.

4.3.3 The Effect of Past Performance Upon Self Efficacy

Previous research has shown that prior performance attainments can have a significant effect upon perceived levels of self efficacy strength and magnitude in the future (Bandura & Cervone, 1983; Locke, Frederick, Lee & Bobko, 1984; Norwich, 1986; Podsakoff & Farh, 1989). In this study, self efficacy strength was related to past performance. It was also expected that past performance would have a similar impact upon self efficacy level, because of the relatively high correlation between the variables which had previously been found. However, the results of the ANOVA show that this was not the case. This finding questions the reliability of the self efficacy measures, as will be discussed in Chapter Seven of this report.

Podsakoff and Farh (1989) also showed that not only does prior performance affect self efficacy, but self efficacy, in turn, influences future performance. Therefore it was presumed that previous performance accomplishments would affect the perceived self efficacy levels of the subjects in the main experiment and that these levels would influence their overall performance.

4.3.4 The Effect of Year of Education Upon Self Efficacy

Prior to the experiment it was expected that university students could have inflated levels of self efficacy for the task, due to their environment. Therefore it was necessary to examine the self efficacy strength and level of people outside

of the university environment, in order to determine exactly which experimental participants could be considered "low" self efficacy subjects.

It was discovered that the self efficacy strength and level scores of university students were significantly below those of the college students. This result shows that students who rate themselves as having low self efficacy for the task, are actually low in self efficacy, when compared to a sample which is considered more representative of the general population. This finding suggests that the results of the main experiment could perhaps generalise beyond the sample group, however the extent of the generalisability is not known.

4.3.5 Sex Differences Within the Results

The self efficacy literature has shown that where non-sex-linked tasks (e.g., verbal anagram tasks) are used in research, gender differences are usually eliminated (Bandura & Cervone, 1986; Campbell & Hackett, 1985). When sex linked tasks (e.g., mathematical series tasks) are used however, greater differentiation is noted between the self efficacy ratings of men and women. The present study revealed no significant sex differences in the results, as was expected, and therefore it was concluded that the likelihood of finding sex differences in the main experiment would be negligible.

CHAPTER FIVE

METHOD - MAIN EXPERIMENT

5.1 STUDY DESIGN

The study was designed to determine the difference between the performance of high and low self efficacy subjects, in a grouped or individual condition, after receiving positive or negative feedback about their performance. The following variables were employed:

1) Dependent variable = Percentage performance change after feedback,

2) Independent variables = Self Efficacy (High or Low)

Feedback (Above or Below Target)

Group size (Alone or Group of Ten)

This resulted in a 3 way (Self Efficacy x Group Size x Feedback) Analysis of Variance design with uneven cell sizes.

5.1.1 Subjects

One hundred and thirty seven Stage One Psychology Laboratory students (62 male, 75 female) participated in the main experiment. Participation was voluntary, and the experiment was spread over two weeks. In week one, the subjects filled in the Self Efficacy Questionnaire, and then in week two, completed the Ten Minute Anagram Test.

5.1.2 The Research Instruments

The two research instruments used in the Main Experiment were:

1. The Self Efficacy Questionnaire (Appendix A).

This is essentially the same as that utilised in the preliminary experiment. However, students were also asked to note their highest level of education that they had achieved to date, for example an 'A' or 'B' bursary, U.E., Sixth form Certificate, passed university courses, and so on.

2. The Ten Minute Anagram Test. (Appendix C)

The Ten Minute Anagram Test was devised by the experimenter, and was divided into two five minute halves. The first half of the test comprised fifty five letter anagrams which had a "nature" theme, these were the same as those used in the preliminary experiment . The anagrams were all common five letter English nouns, of similar difficulty. Instructions on the front of the test were the

same as those on the Five Minute Anagram Test, however at the bottom of the page the subjects were given a team or an individual goal to be attained. These were written as follows:

"Your team goal is to complete 300 anagrams in 10 minutes".

"Your individual goal is to complete 30 anagrams in 10 minutes".

The second page of the test comprised 50 anagrams, with the words "TOTAL CORRECT" written at the bottom of the page.

As it was necessary for students to receive feedback at the mid point of the experiment, the answers to the first 50 anagrams were stapled inside the back page (P.4) of the Ten Minute Anagram Test paper. These answers were able to be pulled out at the appropriate time for the students to mark their own work, and fill in the number correct at the bottom of the first test page.

The third page of the test was a feedback sheet. The subjects were asked to fill in the following:

My score is:

My team score is: (Given by the experimenter)

My team average is: (Given by the experimenter)

I am above/below/on target (Circle one answer)

My team is above/below/on target (Circle one answer)

The final page comprised 50 anagrams to be completed in the five minute second half of the test, with the words "TOTAL CORRECT" written at the bottom of the page.

In a pilot study, the Ten Minute Anagram Test had been administered to a group of 34 Stage One Psychology laboratory students. The focus of the pilot study was on the comprehensibility of the instructions, and the suitability of the method of feedback to the students about their efforts. Findings from the pilot study indicated that students readily understood what was required of them, and the method of feedback was effective and easily administered. However, it was found that students needed to be told not to turn over any pages except for the one they were currently working on, and not to talk to anyone during the course of the experiment.

5.1.3 Procedure

Data were collected from the university student population during laboratory sessions over a two week period, (10-14 July, 17-21 July), just after the mid point of the university year.

WEEK ONE:

The researcher attended four Stage One Psychology laboratory sessions in the first week of the experiment, explained a little about the purpose of the research, and instructed the subjects on how to complete the questionnaire. The instructions were uniform for the four groups.

After a general introduction from the Teaching Fellow, the researcher said the following:

"I am studying for an M.A in Industrial and Organisational Psychology, and am currently doing my thesis which is looking specifically at group motivation. The research is in two parts, and this week I would appreciate it if members of this class would fill in a very short questionnaire, it will only take a couple of minutes of your time. Please note however, that participation in this experiment is voluntary. I will be returning next week to conduct a 15 minute experiment with you. When you receive the questionnaire, please write in your laboratory time and put a code name on the top, not your own name as I want you to remain anonymous. You will be required to remember this code name for next week. Please do not talk to anyone about your answers. If you have had considerable experience in doing word games, like scrabble, crossword puzzles, unscrambling words, then I do not want you to take part in this experiment. After you have completed the questionnaire, please hand it back in. Thank you very much for your cooperation."

One hundred and thirty seven students attended their laboratory groups the week data were collected .

The Self Efficacy Questionnaires were given to all students, and were handed back in immediately upon their completion. The researcher thanked the classes for their participation and reminded the students to remember their code names for the fifteen minute experiment to be conducted the following week.

After having collected the data for each of the four laboratory classes, the researcher sorted the students in each class into high and low self efficacy groups. Those whose self efficacy strength and level scores were below the average of the sample considered more representative of the general population (as determined in the preliminary experiment) were called low self efficacy subjects, while those whose scores were above average were called high self efficacy subjects.

The researcher then randomly divided each class into one group of high self efficacy subjects ($n=10$), who were to work on the Ten Minute Anagram Solving Test as a team, one group of low self efficacy subjects ($n=10$), who were also to work as a team on the task, and a number of both high and low self efficacy subjects who were to work as individuals on the task.

WEEK TWO:

The researcher returned to the laboratory classes one week later, and asked the subjects who had filled in the Self Efficacy Questionnaire the week before, to participate in a fifteen minute experiment. Subjects were told that their code names would be called out in several groups, and that they would be taken into the room next door for the experiment. The subjects were instructed to find their test papers with their own code names on the front, and seat themselves in front of their test paper, without talking to any other participant. They were asked to read through the instructions on the front page, but not to turn over any pages until they were asked.

The ten low self efficacy and ten high self efficacy subjects working as teams were placed alternately around a cluster of desks, seating twenty subjects. Every second subject had a slightly rearranged test of randomly selected anagrams so as to minimise the likelihood of subjects copying from each other.

In the pilot study the ten high and ten low self efficacy subjects had been placed in separate groups, with each group seated in a relatively tight circle. However, this tight grouping appeared to affect the overall team performance and thus in the main experiment, the groups were alternately mixed.

The low and high self efficacy subjects working as individuals were placed alternately around a number of other desks.

The grouped subjects were told that they were to work as teams on an anagram solving task. Each team was identified by a different coloured dot on the front page of the test, the low self efficacy group had a red dot, while the high self efficacy team had a blue dot (subjects however, were not aware of the meaning of the coloured dots except that they identified the different teams). The task was to complete 300 anagrams as a team in ten minutes, this goal was written on the front page of the tests.

Individual subjects were told that they were working alone on an anagram solving task and that they had to complete 30 anagrams in ten minutes.

Subjects were requested to turn over and work on the anagram solving task for five minutes. After five minutes had elapsed, the subjects were asked to stop

working. They were then asked to pull out the answers to the anagrams which were hidden inside the back page of their four page question sheets and mark their own work, entering at the bottom of the page the total number of anagrams correct. They were then instructed to turn over the page and enter their scores on the feedback sheet (p.3 of the test), while the experimenter's assistant went around each member of the two teams and gathered their scores.

Although the actual scores were summed for each team, the subjects were told a false score:

Red Dot Group = 151 anagrams solved

Blue Dot Group = 153 anagrams solved

These scores were held constant for each of the experimental sessions.

This control was deemed necessary as it was found in the pilot study that the low self efficacy team had difficulty in attaining the team goal, and in the second half of the experiment performed even more poorly. Thus in the actual experiment the false scores were introduced in order to control for the possibility that one or both teams performed below the target in the first half of the experiment.

Subjects in the grouped condition noted the team score and team average on the feedback sheet, and then were asked to circle whether their team was above/below/on target after five minutes of work, and whether they as an individual were above/below/on target.

Subjects in the individual condition noted whether they were above/below/on target after five minutes of work.

The subjects were then asked to solve the anagrams on the last sheet for five more minutes, and at the end of this time, they were asked to stop and hand in their tests. As there was not sufficient time to let the subjects find out how well they had done as teams or as individuals in the second half of the experiment, the researcher told them that she would return to the laboratory class at a later time to tell the students what the experiment was about and to give them verbal and written feedback about the results. The students were also told that their individual results would be available to them in written form at this time. The researcher thanked the students for their participation and cooperation and partially explained the rationale behind the study.

CHAPTER SIX

RESULTS - MAIN EXPERIMENT

Two analyses of the data from the main experiment were carried out. The four hypotheses outlined in Chapter Three were tested by a three factor (Self Efficacy x Group Size x Feedback) between groups Analysis of Variance. A series of t-tests were performed to further examine any significant effects which were found.

6.1 THE EFFECT OF PERCEIVED SELF EFFICACY AND FEEDBACK UPON INDIVIDUAL PERFORMANCE AND INDIVIDUAL PERFORMANCE WITHIN GROUPS

Hypothesis 1 stated that high self efficacy subjects working in the individual condition would increase their level of performance, after receiving negative feedback. A three factor (Self Efficacy x Group Size x Feedback) between groups Analysis of Variance was performed to test this hypothesis. The results of this ANOVA are shown in Table 4 and Figure 1.

Table 4. ABC Incidence Table⁸

| Size | Individual | Individual | Group | Group | Totals |
|---------------|------------|------------|--------|--------|--------|
| Target | Above | Below | Above | Below | |
| High | 11 | 11 | 14 | 26 | 62 |
| Self Efficacy | 0.182 | 20.727 | -0.286 | 44.115 | 22.145 |
| Low | 15 | 20 | 15 | 25 | 75 |
| Self Efficacy | -3.6 | 26.7 | 18.333 | -34.36 | -1.387 |
| Totals | 26 | 31 | 29 | 51 | 137 |
| | -2 | 24.581 | 9.345 | 5.647 | 9.263 |

⁸Calculated on Statview 512 on a Macintosh computer.

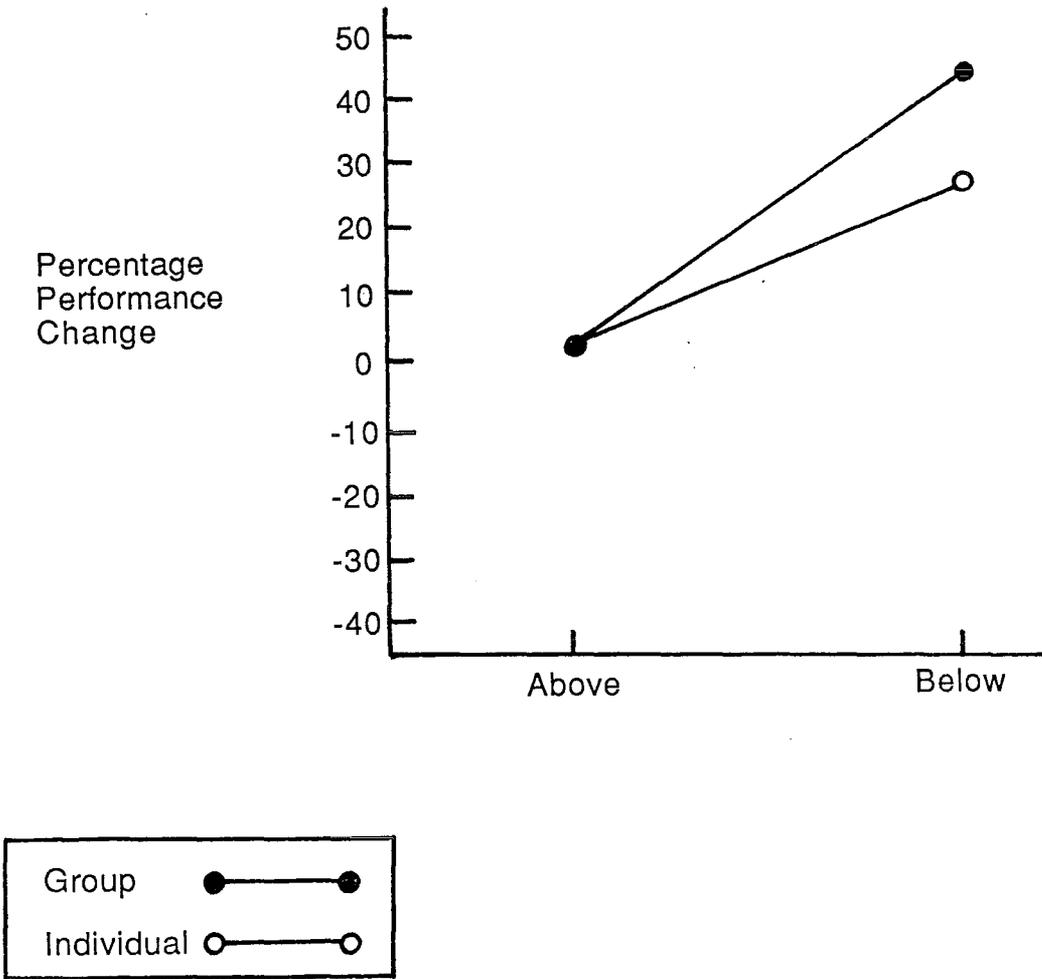


Figure 1. The ABC interaction effect: High self efficacy subjects.

The results show that the mean percentage performance change of high self efficacy individual condition subjects who received negative feedback was 20.72. These results therefore support Hypothesis 1, as the high self efficacy subjects working in the individual condition did increase their level of performance after receiving negative feedback.

The second hypothesis stated that low self efficacy subjects working in the individual condition would decrease their level of performance, after receiving negative feedback. A three factor (Self Efficacy x Group Size x Feedback) between groups Analysis of Variance was performed to test this hypothesis. The results of this ANOVA are shown in Table 4 (above) and Figure 2 (below).

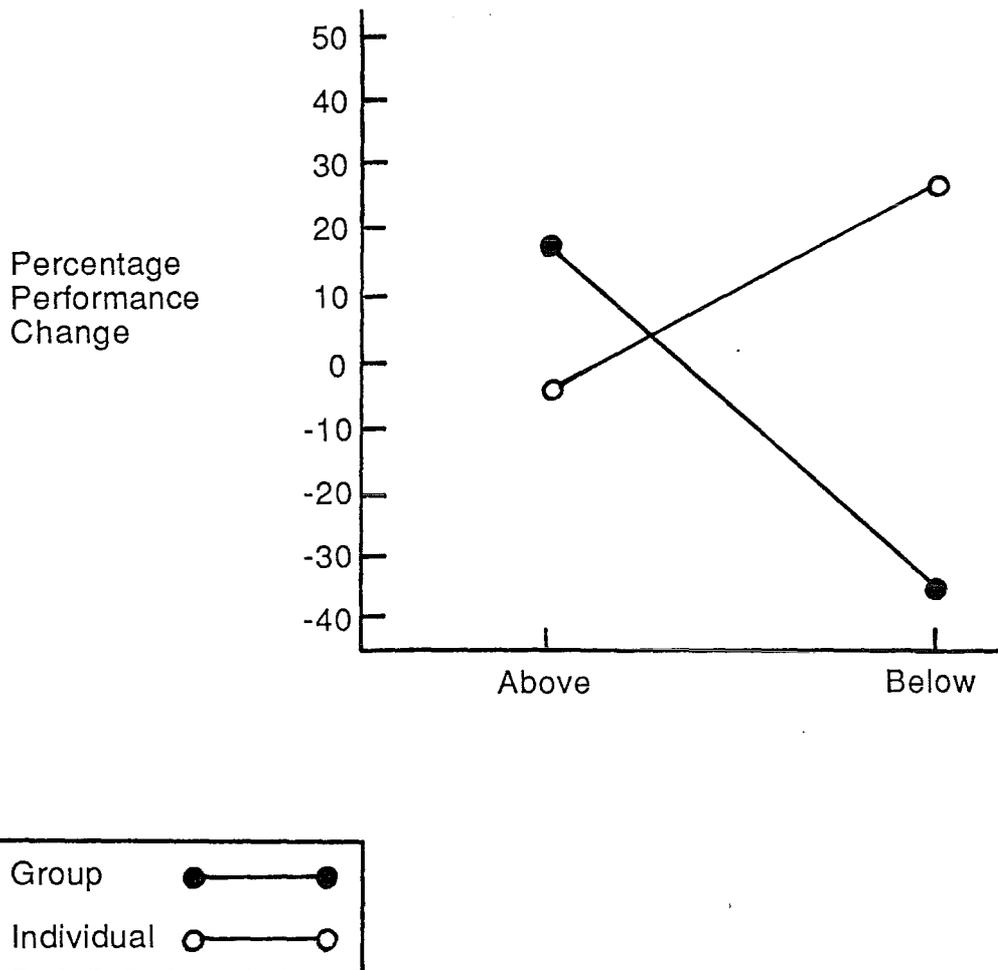


Figure 2. The ABC interaction effect: Low self efficacy subjects.

The results show that the mean percentage performance change of low self efficacy individual condition subjects who received negative feedback was 26.7. These results therefore do not support Hypothesis 2, as the low self efficacy subjects working in the individual condition increased their level of performance after receiving negative feedback.

The third hypothesis stated that high self efficacy and low self efficacy subjects working in the individual condition would decrease their level of performance, after receiving positive feedback. A three factor (Self Efficacy x Group Size x Feedback) between groups Analysis of Variance was performed to test this hypothesis. The results of this ANOVA are shown in Table 4 (above) and Figure 1 and Figure 2 (above).

The results show that the mean percentage performance change of high self efficacy individual condition subjects who received positive feedback was 0.182. The mean percentage performance change of low self efficacy individual condition subjects who received positive feedback was -3.6. These results therefore partially support Hypothesis 3. The low self efficacy subjects decreased their level of performance as predicted, but the high self efficacy subjects slightly increased their level of performance.

Hypothesis 4 stated that low self efficacy subjects working in the grouped condition, whose individual feedback was below target, but group feedback was above target, would display a greater decrease in their level of postfeedback performance than low self efficacy subjects working in the individual condition, whose feedback was below target.

A three factor (Self Efficacy x Group Size x Feedback) between groups Analysis of Variance was performed to test this hypothesis. The results of this ANOVA are shown in Table 4 (above) and Figure 2 (above).

The results show that the mean percentage performance change of low self efficacy individual condition subjects who received negative feedback was 26.7. The mean percentage performance change of low self efficacy grouped condition subjects who received negative feedback was -34.36. These results therefore support Hypothesis 4. Low self efficacy subjects in the individual condition, who were below target at the midway point of the experiment, increased their performance in the second half significantly more ($t(129) = 5.35$, $p \leq 0.001$) than low self efficacy subjects in the grouped condition, who were below target.

6.2 FURTHER ANALYSES

An ANOVA summary table for the following results is given in Table 5.

Table 5. Three Factor Between Groups ANOVA Examining the Effect of Self Efficacy and Feedback Upon Individual Performance and Individual Performance Within Groups⁹.

| Source | <i>df</i> | Sum of Squares | Mean Square | <i>F</i> |
|--------|-----------|-------------------|----------------|-----------|
| A | 1 | 6456.374 | 6456.374 | 4.466* |
| B | 1 | 509.934 | 509.934 | 0.353 |
| AB | 1 | 7474.854 | 7474.854 | 5.170* |
| C | 1 | 3515.787 | 3515.787 | 2.432 |
| AC | 1 | 14810.950 | 14810.950 | 10.244** |
| BC | 1 | 6790.259 | 6790.259 | 4.697* |
| ABC | 1 | 22166.566 | 22166.566 | 15.332*** |
| Error | 129 | 186508.22 | 1445.800 | |

* = $p \leq 0.05$

** = $p \leq 0.01$

*** = $p \leq 0.001$

⁹Calculated on CLR ANOVA on a Macintosh computer.

The subjects' levels of performance were affected by their perceived levels of self efficacy for the task; $F(1,129) = 4.466, p \leq 0.05$

Neither feedback nor working individually or in a group had an effect upon subject performance when these variables were considered on their own. (Size: $F(1,129) = 0.353, n.s.$; Feedback: $F(1,129) = 2.432, n.s.$)

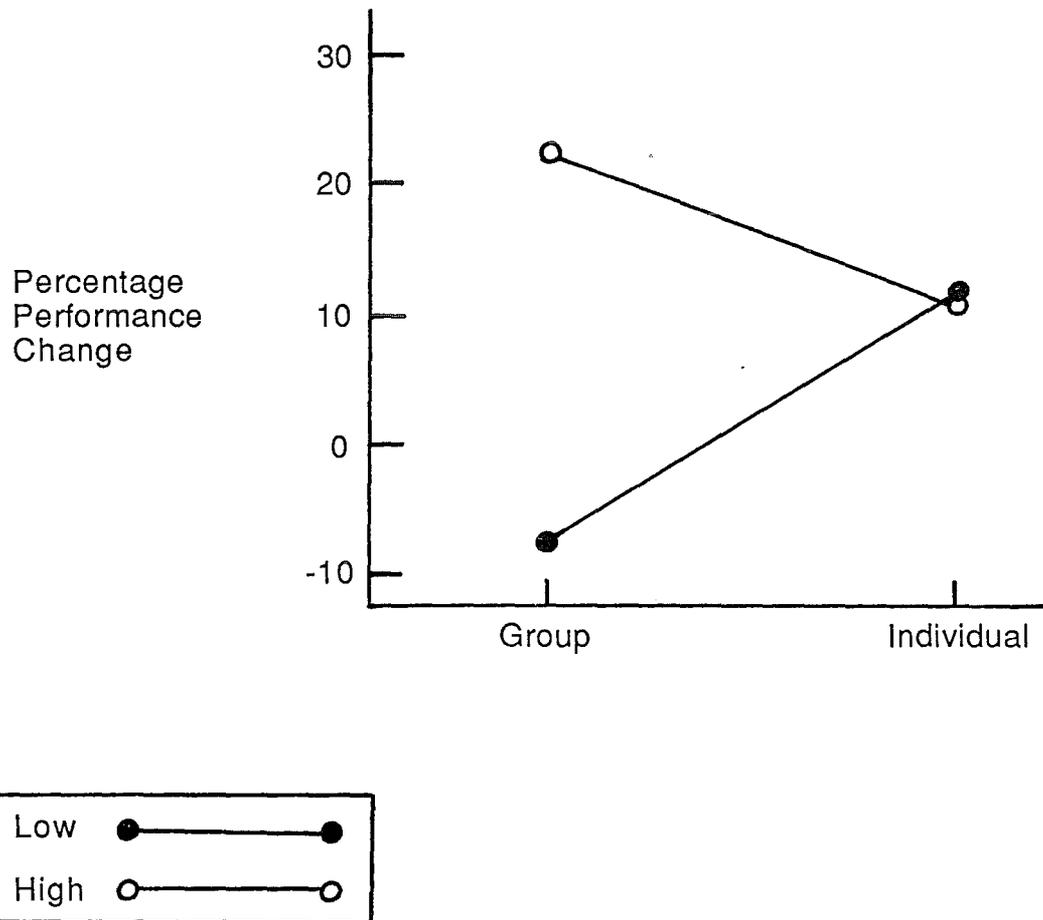


Figure 3. The self efficacy x group size interaction effect.

The grouped subject condition was found to greatly affect the performance level of both low self efficacy and high self efficacy subjects, whereas the individual condition did not greatly affect performance change for either high or low self efficacy subjects; $F(1,129) = 5.17, p \leq 0.05$

(See AB Incidence Table in Appendix H, and Figure 3).

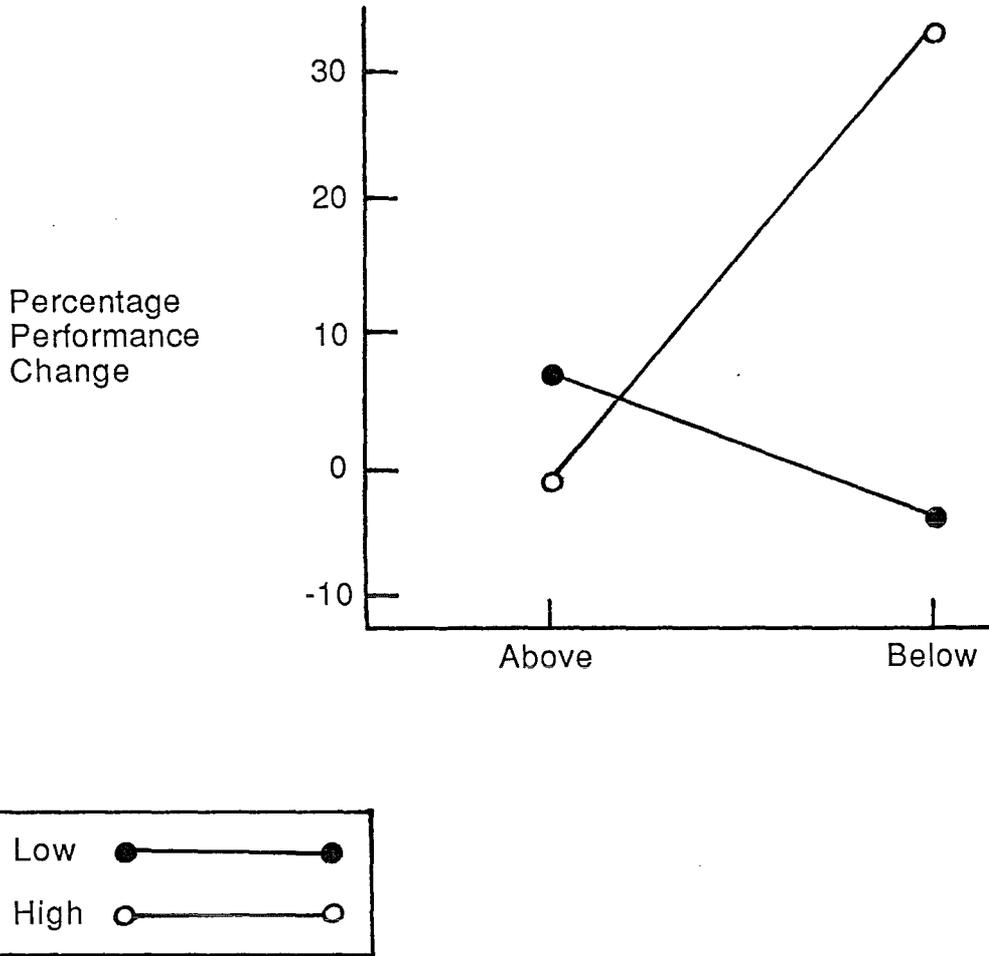


Figure 4. The self efficacy x feedback interaction effect.

Feedback indicating that subjects were above target had little impact upon the performance of either high or low self efficacy subjects, but feedback indicating that subjects were below target affected the performance level of both high and low self efficacy subjects; $F(1,129) = 10.24, p \leq 0.01$

(See AC Incidence Table in Appendix I, and Figure 4).

A significant combined interaction effect was noted (See Table 4):

Self Efficacy x Group Size x Feedback $F(1,129) = 15.332, p \leq 0.001$

1) High self efficacy subjects: Positive feedback had very little affect upon either grouped or individual condition subjects, but negative feedback had a large impact upon the grouped condition subjects, who increased their performance greatly, and individual condition subjects, who increased their performance slightly. (See Figure 1)

2) Low self efficacy subjects: Positive feedback had an ameliorative affect upon grouped condition subjects, but little affect upon individual condition subjects. However, negative feedback had a great impact upon individual condition subjects, who increased their performance and on grouped condition subjects, who decreased their performance. (See Figure 2)

6.3 T-TESTS DETERMINING SIGNIFICANT DIFFERENCES BETWEEN MEAN PERCENTAGE PERFORMANCE CHANGE

1) High self efficacy subjects in the grouped condition, who were below target at the midway point of the experiment, increased their performance in the second half significantly more ($t(129) = 7.36, p \leq 0.01$) than low self efficacy subjects in the grouped condition, who were below target.

2) Low self efficacy subjects in the individual condition, who were below target at the midway point of the experiment, increased their performance in the second half significantly more ($t(129) = 2.33, p \leq 0.005$) than low self efficacy subjects in the individual condition, who were above target.

3) High self efficacy subjects in the grouped condition, who were below target at the midway point of the experiment, increased their performance in the second half significantly more ($t(129) = 3.53, p \leq 0.01$) than high self efficacy subjects in the grouped condition, who were above target.

4) Low self efficacy subjects in the grouped condition, who were above target at the midway point of the experiment, increased their performance in the second half significantly more ($t(129) = 4.25, p \leq 0.001$) than low self efficacy subjects in the grouped condition, who were below target.

5) Low self efficacy subjects in the individual condition, who were below target at the midway point of the experiment, increased their performance in the

second half significantly more ($t(129) = 5.35, p \leq 0.001$) than low self efficacy subjects in the grouped condition, who were below target.

CHAPTER SEVEN

DISCUSSION

The findings of this study supported the first hypothesis. High self efficacy subjects in the individual condition increased their level of performance after receiving negative feedback. The second hypothesis was not supported. Low self efficacy subjects working in the individual condition did not decrease their level of performance after receiving negative feedback. Partial support was found for the third hypothesis. High self efficacy subjects in the individual condition slightly increased their level of performance after positive feedback, but low self efficacy individual condition subjects slightly decreased their level of performance after receiving positive feedback. Finally, the results of this study supported the fourth hypothesis. Low self efficacy subjects in the grouped condition whose feedback was below target displayed a significantly greater decrease in their level of postfeedback performance than low self efficacy subjects working in the individual condition, whose feedback was also below target. No other specific hypotheses were made for grouped condition subjects, due to a lack of supportive evidence from previous studies.

7.1 THE EFFECTS OF PERCEIVED SELF EFFICACY AND FEEDBACK UPON TASK PERFORMANCE

7.1.1 Individual Condition Subjects

On the basis of previous literature it was expected that perceived self efficacy would have a significant effect upon task performance for individual condition subjects (eg., Bandura & Cervone, 1983, 1986; Podsakoff & Farh, 1989). These researchers have found that when subjects receive negative feedback, those who have high self efficacy for the task will improve their performance significantly more than those who have low self efficacy. The results of the present study indicated that high self efficacy subjects in the individual condition increased their performance after negative feedback, as was expected. Therefore the first hypothesis was supported.

Bandura and Cervone (1983, 1986) and Podsakoff and Farh (1989) found that low self efficacy subjects decreased their level of performance when they received negative feedback. It was hypothesised that this would also occur in the present study. Surprisingly however, the low self efficacy subjects in the individual condition increased their performance after receiving negative feedback, and their performance increase was marginally higher than that achieved by the high self efficacy subjects. This result did not provide support for the second hypothesis.

Previous research has also indicated that when subjects receive positive feedback, both high self efficacy and low self efficacy subjects will slightly

decrease their level of performance (Bandura & Cervone, 1983, 1986; Podsakoff & Farh, 1989). It was hypothesised that this would occur in the present study (Hypothesis 3). The results indicated that high self efficacy subjects in the individual condition slightly increased their level of performance after receiving positive feedback. Low self efficacy subjects in the individual condition slightly decreased their level of performance after receiving positive feedback, although this performance change was not significantly different from that of the high self efficacy subjects.

7.1.2 Grouped Condition Subjects

The results for subjects in the grouped condition were rather different. High self efficacy subjects increased their performance after receiving negative feedback significantly more than low self efficacy subjects, who received negative feedback about their efforts. The high self efficacy grouped subjects greatly increased their performance, while low self efficacy grouped subjects greatly decreased their performance. Although there is no literature concerning the effect of perceived self efficacy upon individual performance in groups, the researcher's expectations from the individual self efficacy literature were that the high-low self efficacy difference would also apply in this case. Thus the results obtained were expected, although the effect was somewhat stronger than anticipated.

It appears that when highly efficacious individuals working in a group are confronted with negative feedback, they increase their efforts on this type of task by almost half again. When low self efficacy subjects working in a group receive negative feedback, then the effects are severely debilitating. The performance

level of the individuals in the group in this case dropped off markedly. Therefore the effect which has been noted in previous literature on individuals (although not obtained in the present study) has occurred for groups also, but it seems to be even greater for the latter.

In a pilot study, the noticeability of this performance drop was even more dramatic. Ten high self efficacy and ten low self efficacy subjects were placed in totally separate groups rather than being alternately placed, as in the main experiment. This seating arrangement did not seem to affect the performance of high self efficacy group members, but it did greatly affect the performance of low self efficacy group members after they received negative feedback. These subjects seemed to give up trying because of the influence of neighbouring group members, who also doubted their own ability to succeed on the task. Therefore it was thought that subjects should be alternately seated in the main experiment, in order to minimise the amount of influence neighbouring subjects could have on each other's performance. The large performance decrement suffered by low self efficacy subjects in the main experiment seemed to be due to the group setting as a whole, rather than to the influence of adjacent individual group members.

It was expected that the effect of positive feedback upon the performance of both high and low self efficacy grouped condition subjects would be similar to the effect of positive feedback upon the performance of individual condition subjects. The results showed that high self efficacy grouped subjects actually maintained the same level of performance after positive feedback. However, the low self efficacy grouped subjects moderately increased their level of performance after positive feedback. This result was not expected, as the

individual condition subjects slightly decreased their level of performance after receiving positive feedback. It seems that when low self efficacy subjects working in a group receive positive feedback, they increase their efforts considerably.

A direct comparison was also made between the performance of low self efficacy individual condition subjects and low self efficacy grouped condition subjects, after receiving negative feedback. The results supported the fourth hypothesis. Low self efficacy grouped subjects displayed a significantly greater decrease in their level of postfeedback performance than did low self efficacy individual subjects. This result implies that the grouped condition affected how the individual reacted to failure. Upon receiving negative feedback, the individual condition subjects became dissatisfied with their previous performance level and therefore tried to reduce the discrepancy between their performance and the unfavourable feedback, by increasing their effort. A similar result had earlier been noted by Matsui, Okada and Inoshita (1983) and Podsakoff and Farh (1989). The low self efficacy grouped condition subject who received negative feedback did not attempt to reduce the discrepancy between his or her failure and the standard. It appears that the group environment led individuals to believe that the blame for not reaching the goal could be shared. The implications of this finding will be discussed later in this report.

7.2 THE EFFECTS OF FEEDBACK AND PERCEIVED SELF EFFICACY UPON MOTIVATION

Previous research has noted that an individual's response to failure is mediated in part by the individual's efficacy regarding his/her ability to reduce the discrepancy between their own behaviour and the desired state (Bandura & Cervone, 1983, 1986). In this present research, a variety of responses to negative feedback was observed for both high and low self efficacy subjects in the grouped and individual conditions. There were less variable responses to positive feedback.

7.2.1 High Self Efficacy Subjects - Individual and Grouped

The literature suggests that if the individual believes that the discrepancy between his or her behaviour and the standard is reducible (ie., the individual's self efficacy for reaching the standard is high) the individual's effort to reach those standards should increase (Podsakoff & Farh, 1989). In this study, high self efficacy individual subjects increased their performance after receiving negative feedback. This increase was higher but not significantly different from the performance change of high self efficacy individual subjects who received positive feedback.

Feedback type appeared to affect grouped condition subjects to a greater extent. High self efficacy subjects who received negative feedback increased their level of performance significantly more than high self efficacy subjects who received positive feedback. Thus negative feedback acted as a motivator for

high self efficacy subjects who were aiming for a team goal, when they learned they were not performing at the expected level. These findings support the ideas of Bandura and Cervone (1986) who noted that perceived self efficacy to attain a challenging standard can enhance and sustain motivation, whatever the level of prior attainment might be.

7.2.2 Low Self Efficacy Subjects - Individual and Grouped

The research cited earlier in the literature review amply documents that strength of perceived self efficacy contributes to motivation at all discrepancy levels (eg., Bandura & Cervone, 1986). In the present study, low self efficacy individual subjects who received negative feedback increased their performance significantly more than low self efficacy individual subjects who received positive feedback. Podsakoff and Farh (1989) suggest a possible reason for this outcome. They state that when negative feedback is received, it sends a clear message to the subject that they have performed considerably below average. Under these conditions, subjects may become disenchanted with their previous performance levels and feel they are under some external pressure to improve their future performance. This may account for the findings of the present study, where negative feedback appeared to motivate low self efficacy individual condition subjects to try harder to attain their goal.

In contrast, subjects in the positive feedback condition are likely to feel little pressure to further improve their performance, because they are led to believe that they have done well in the previous period. In the present research, low self efficacy individual condition subjects who received positive feedback actually lost motivation and slightly decreased their levels of performance. These

subjects seemed to relax after having reached the desired standard, no longer feeling the pressure to perform well.

The opposite effect was observed for groups. Low self efficacy grouped condition subjects who received positive feedback increased their performance level significantly more than the same condition subjects who received negative feedback about their efforts. The latter subjects reduced their efforts by almost one third. Positive feedback appeared to motivate people with little confidence in their ability to perform a task, when they found out they were performing to the desired standard. It appears that the group setting may have aroused a competitive atmosphere between subjects. Those who performed well, despite their lack of confidence in their ability to do the task, gained increased motivation from the knowledge that they could actually achieve the desired standard.

Negative feedback appeared to have the opposite effect. Low self efficacy grouped condition subjects who did not reach the desired goal suffered the greatest motivation loss over all the experimental conditions. This suggests that the findings of previous research on the reactions of low self efficacy individuals who receive negative feedback (eg., Podsakoff & Farh, 1989) may not apply to low self efficacy individuals performing within the context of a group. Whereas this research has shown that individuals reactions to failure to reach a performance standard are to intensify their effort, the present study has shown that the individual's reaction to failure when part of a group, is to give up trying. This finding could have important implications for teamwork within organisations, as will be discussed later.

Overall then, while negative feedback seemed to motivate high self efficacy and low self efficacy individual condition subjects, positive feedback only appeared to motivate low self efficacy subjects who were performing within a group. This is in accordance with the findings of Bandura and Cervone (1986) who note that “knowledge of having surpassed a demanding standard through laborious effort does not automatically raise aspiration” (p.110). Therefore, although the feedback literature suggests that positive feedback is motivating in most circumstances, the present study has discovered one condition where this is not necessarily the case.

Low self efficacy individual condition subjects did not gain increased motivation from the knowledge that they were performing to the desired standard. Under positive feedback conditions it appears that individuals feel satisfied with their progress and few changes take place in the effort they put forth, especially when they doubt their ability to achieve their goal. This finding implies that it may not necessarily be beneficial to give positive feedback to individual employees in the workplace, who have little confidence in their ability to succeed at the task they are performing. If however, a group of employees are working together on a task, then it appears that positive feedback is of great benefit to those who doubt their capability of reaching a certain standard. These subjects seem to perform a great deal better with the knowledge that they are surpassing the efforts of others, thus competition seems to be an important motivator.

7.3 SELF EFFICACY - A MODERATOR OF SOCIAL LOAFING AND FREE RIDING

As has been noted in the literature review on social loafing and free riding, groups often fall short of their productive potential; group performance is often less than the summed output of each individual working alone (Weldon & Gargano, 1985). While performance decrements may be due to coordination problems (Steiner, 1972), motivation loss has frequently been cited as the cause. This decrease in individual performance has been termed social loafing.

One intention of the present study was to examine whether the motivation loss suffered by some low self efficacy individuals when they are informed that their performance falls short of the desired standard (Bandura & Cervone, 1984) is greater when these individuals are performing as part of a group. This finding would indicate that self efficacy potentially moderates the occurrence of social loafing.

The present study was designed to ensure good control over most of the variables which have previously been found to moderate social loafing and free riding. As mentioned in the rationale for the study, the only factor involved which should have had an impact upon the occurrence of social loafing and free riding was the group size. A group size of ten has been considered large enough to permit the free riding choice process to occur (Albanese & Van Fleet, 1985).

The results of the present study indicate that social loafing and free riding did occur, but only within one group of subjects. It happened in subjects who had

low levels of self efficacy for doing the task, who were working as a group, with an individual and a team goal to attain. When these subjects found that they were performing to a substandard level, they mostly gave up trying and free rode on other group members. High self efficacy subjects however, who were working as a group on the task gained increased motivation from the knowledge that they were performing poorly.

After the completion of the experiment, the low self efficacy grouped subjects were asked verbally how they reacted to the knowledge that they were performing below the desired standard, while the rest of the group was performing well. A number of subjects commented that they thought they were useless at the task, and no matter how hard they tried, they did not seem to get any better. A few mentioned that they kept trying after receiving negative feedback, but the majority indicated that they gave up trying, in the belief that the rest of the group was faring a great deal better. Upon looking at the raw data, it was noted that a couple of subjects gave up completely and did not even bother attempting to solve any anagrams in the second half of the experiment, after learning they were performing poorly. These elements seem to affirm the notion that social loafing did occur in the low self efficacy group.

Overall then, it is possible to conclude that low self efficacy is a potential moderator of the social loafing and free riding effects. Even though large group size may also have contributed slightly to the occurrence of social loafing in this study, the likelihood of other potential mediators impacting upon social loafing and free riding was negligible. As this is the first study to directly examine the possibility of self efficacy acting as a potential moderator of social loafing and

free riding, the positive result obtained suggests a great deal more research into this subject may be warranted.

This research focussed on the role that self efficacy plays in producing loafing effects. It is not proposed that effects stemming from self efficacy account for all, or even most motivation losses in groups. Any number of other variables may affect performance in group settings (eg., dispensability of member effort; Kerr & Bruun, 1983). Rather it is argued that self efficacy plays a central role in producing the reduction in effort termed social loafing. In future, research will be necessary to determine how other factors interact with self efficacy for the task to motivate performance in group settings. Further research is also needed to develop an assessment for group efficacy as it is possible that group perceptions of efficacy are related to group performance, and hence, to social loafing.

7.4 LIMITATIONS OF THE STUDY

7.4.1 Effectiveness of Manipulations and Controls

Although a number of manipulations and controls for the main experiment were outlined in Chapter Three, the effectiveness of these was not measured. The experimenter was only allowed to utilise 20 minutes of the laboratory time, and as the main experiment took 15 minutes to complete, along with five minutes of debriefing, it was not possible to include another questionnaire measuring control effectiveness. Thus the possible impact of the manipulations and controls on the results of the main experiment could not be gauged. It is necessary then, to take caution in interpreting the experimental results, as it is

possible that some of these manipulations or controls were not as effective as was hoped. The lack of measurement of these variables is a limitation of the present study, and future studies should carefully measure, rather than presume the extent of their effectiveness.

7.4.2 Self Efficacy Measurement Problems

The present study relied upon a very simple measure of task specific self efficacy strength and self efficacy level. These were assessed on a two-item scale which had previously been used by Campbell and Hackett (1986) and Hackett and Campbell (1987). Even though these researchers did assess the test-retest reliability of this scale, no validation of this scale appears in the literature. Neither has there been any critique of the SEQ in the literature to date.

In the present study, the results of a correlation between self efficacy strength and self efficacy level indicated that the variables were moderately correlated, but the results were not as high as expected. Thus, a more complete assessment of task specific self efficacy may have resulted in a higher correlation being obtained between self efficacy strength and self efficacy level. Bandura (1977) recommends microanalysis, or the computing of the percentage of items for which efficacy and performance agree. This type of scale may have provided a more accurate assessment of self efficacy strength and level for the anagram solving task utilised in this experiment.

Even though the present study used measures of self efficacy which were the same as those used in earlier studies, the self efficacy scale may be partly

responsible for the discrepancy between one of the findings of the present study and previous literature. Low self efficacy subjects in the individual condition were expected to maintain or slightly increase their performance after receiving negative feedback. The results showed that these subjects greatly increased their performance, surpassing the efforts of high self efficacy subjects. It is possible that the self efficacy scale utilised here caused the disagreement because of two reasons. Norwich (1986) criticises pencil and paper self report measures of self efficacy, stating that this type of assessment is open to a number of well known distortions. It is also noted that this type of self efficacy measure could produce reactive effects on behaviour.

7.4.3 Small Sample Size

Another factor which could have been partially responsible for the discrepancy noted above, was the small sample size. Even though overall a large number of subjects were used, some of the experimental conditions contained fewer than fifteen subjects. Any future research would need to increase the number of subjects in each experimental condition to enable a more accurate assessment of the results.

7.4.4 Sex Differences

In addition to the results reported above, the experimenter could have examined sex differences in self efficacy for the anagram solving task, and in the occurrence of social loafing. After having searched the literature however, it was noted that an examination of sex differences is only really appropriate when sex-linked tasks are used (eg., a mathematical series task used by

Campbell & Hackett, 1986). Previous research deemed the anagram solving task used in the present study to be more "gender neutral" (Hackett & Campbell, 1987). Therefore an analysis of sex differences in task self efficacy was not considered necessary. Similarly, earlier research has shown that in most cases, social loafing occurs with females to the same extent as with males (Harkins, Latané & Williams, 1980). Although the experimenter in the present study realises that an examination of sex differences in social loafing could have been of interest, it was not considered to be important, due to the findings of previous research.

7.4.5 Generalisability

Several limitations concerning the generalisability of results from the present study should be noted. The first concerns the artificiality of the task. It was deemed important to use a task which had previously been used by other researchers (Campbell & Hackett, 1986; Hackett & Campbell, 1987) and which was "gender neutral", as emphasised by Hackett and Campbell (1987). An anagram solving task was therefore used, as it was in accordance with this criterion. This task was also employed for its ease of use over a range of subjects, and feedback about individual and group performance on the task could easily be given.

It has been suggested though that it would be useful to employ tasks possessing clearer relevance to organisational performance than verbal anagrams, such as performing job evaluations (Lent & Hackett, 1987). This is especially applicable to the present study, as the findings might have important implications for organisations. Considerable caution must therefore be taken,

when generalising the present results to the outside environment, due to the nature of the task employed.

A second limitation concerns artificiality of subjects and the experimental setting. This study was carried out in a laboratory setting using student subjects. Although a great deal of the social loafing and self efficacy research has been carried out in laboratories using student samples, few studies have determined whether the results generalise well from laboratory to field settings.

A third limitation concerns the artificiality of the "groups". It was considered that in reality, workgroups would generally comprise a selection of employees with both high and low self efficacy for the task. Thus in the main experiment subjects were placed in mixed high and low self efficacy groups, in an effort to emulate the real world. Once again, care must be taken in generalising the results to the workplace because of the contrived nature of the groups in the main experiment.

In the present study, it was suspected that university students might have inflated levels of perceived self efficacy for the anagram solving task, due to the nature of their environment. In order to test this idea, a sample of high school students were asked to complete the same questionnaire and test, the results being compared with those of university students. As it was found that Stage One university students did not have inflated levels of self efficacy for the task, it was presumed that the experimental results might be able to generalise beyond the sample group. However, the extent of the generalisability has yet to be established.

First year psychology students at the University of Canterbury comprised the main experimental sample in this study. It is not possible to generalise the results beyond this sample because it is not known to what extent psychology students are typical of the university population. Sixth and seventh form students from Ashburton College comprised the sample for the preliminary experiment, which was considered to be more representative of the general population. However, this sample may have been biased because of the rural nature of the community, and it is difficult to gauge exactly how typical these students are of the general population.

This study necessarily included a number of restrictions in order to adequately investigate the variables of interest here and the laboratory setting was considered ideal for maximum control. It is not known how well the experimental results generalise from the laboratory to an organisational setting, where such variables may be in free play. It must be noted however, that the limitations of the present study should not invalidate its findings, nor lessen the potential importance of the issues which lead to the inception of this research.

7.4.6 Implications

The results of this study suggest a number of practical implications. The findings indicated that self efficacy has a significant effect upon individual performance within a group. Low self efficacy, when combined with negative feedback has a severely detrimental effect upon performance, leading to motivation loss, which in this circumstance is termed social loafing. Therefore low self efficacy can be considered a potential moderator of social loafing and free riding.

This result suggests that it may be important to assess individual self efficacy levels for a task where teamwork is required. Accurate assessment of individual self efficacy levels may make the team more productive overall, as those low in self efficacy for the task could be asked to work individually, or could be given a different task for which they have higher levels of self efficacy, if some flexibility of task allocation is present. The findings of this study also suggest that unexpectedly low productivity levels within groups could be caused by individuals with low levels of self efficacy for the task. If these individuals could be identified and removed from the team, or given efficacy enhancing training, there could be a number of benefits for the groups and for the organisation as a whole.

Gist (1987) states that this training could take the form of enactive mastery or modelling, as these have been the most successful methods for enhancing self efficacy (Bandura & Adams, 1977; Bandura, Adams & Beyer, 1977). Gist also suggests that films might be developed and tested to model successful performance for training purposes. Classes might be used to allow participants guided mastery experiences in key performance areas. Gist mentions that these could be coupled with self-modelling videotapes for important skills.

There are also important implications for personnel selection procedures. The results of this study imply that some assessment of self efficacy may be worthwhile as one element in selection decisions, especially if the employee will be required to take part in group work.

It appears that some researchers have been rather premature and naive in proclaiming the motivational benefits of teams over and above individual work. Although there are some situations where teams do provide increased motivation for participants, for example high self efficacy subjects who receive negative feedback about their performance, teams can also have a deleterious effect upon productivity. This is in addition to the classical social factors such as restrictive output norms, and it can be to the detriment of the organisation as a whole. The results of the present study imply that it would be extremely beneficial to further examine the concept of self efficacy in relation to group performance.

7.4.7 Future Research Recommendations

The results of this study suggest a number of future research needs. The literature review demonstrated that although some research has examined the relationship of self efficacy and feedback to individual performance, there have been no studies examining the relationship of self efficacy and feedback to group performance. The findings of the present research strongly emphasise the need to extend self efficacy theory to groups.

In the future, the measurement of self efficacy needs additional research attention, as there appear to be few validated instruments which cover the broad range of tasks frequently utilised in the research. Lent and Hackett (1987) and Podsakoff and Farh (1989) have noted that new testing instruments are required to assess new domains of self efficacy.

If the concept of self efficacy is to be extended to groups, and as Bandura (1982) suggested, to groups as large as nations, then research is needed to develop an assessment instrument for group efficacy. Gist (1987) mentions that one approach might be to aggregate individual efficacy perceptions and compare them to subsequent group performance measures. Another might be to have individuals rate their own perceptions of the group's efficacy and then to average their responses. Gist (1987) also suggests that a different possibility could be using group consensus responses to a single efficacy questionnaire. The best method for predicting subsequent performance would have to be determined from these suggestions. It is possible that by using a valid instrument, research may show that group perceptions of efficacy are related to group performance. Obviously there is considerable scope for future research to investigate how the concept of group efficacy could be applied to all levels of organisational analysis.

Future research should utilise tasks which are more relevant to actual jobs. Much of the research to date has limited applicability when it comes to its impact on the productivity of organisations. It is not carried out on the types of jobs that are typical of ongoing organisations. Thus the generalisability of the findings to more prevalent, complex jobs is unclear. It must be realised however, that there are major practical difficulties which accompany attempts to undertake this type of research.

Similarly it would be interesting to pursue the implications of the results obtained here, in the field, and it is believed that the laboratory study described here justifies doing so. This may be difficult, but it would definitely be useful to

determine the extent of empirical support for the concept of self efficacy within the organisational context.

7.5 CONCLUSIONS

A number of conclusions are supported by the findings of the present study. Firstly, low self efficacy subjects working in a group, lose motivation and greatly decrease their performance when they are given negative feedback. In contrast, high self efficacy subjects working in a group, gain motivation and greatly increase their performance when they are given negative feedback. These effects have also been noted within individuals. However the results appear to be stronger for individuals working in groups. Secondly, social loafing did occur in this study, but only in low self efficacy grouped condition subjects, who received negative feedback. Therefore it can be concluded that low self efficacy is a potential moderator of the social loafing effect.

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APPENDIX A

THE SELF EFFICACY QUESTIONNAIRE

CODENAME:

SEX: M or F (Circle one)

An anagram is a series of letters which can be unscrambled to form a word.

This is an example of an anagram:

EXAMPLE: DGEIR

ANSWER: RIDGE

Please rate your level of confidence in completing an anagram test (solve 30 anagrams in 5 minutes):

Please circle your answer:

| | | | | | | | | | |
|---------------|---|---|-----------|---|---|----------------|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Not confident | | | Confident | | | Very Confident | | | |

Please estimate the number of anagrams you expect to solve successfully in 5 minutes:

ANSWER: (Choose a number between 0 - 50)

APPENDIX B

THE FIVE MINUTE ANAGRAM SOLVING TEST

CODENAME:

SEX: M or F (Circle one)

LAB:

An anagram is a series of letters which can be unscrambled to form a word.

This is an example of an anagram:

EXAMPLE: DGEIR

ANSWER: RIDGE

All anagrams in this test are common five letter words which have a `nature` theme.

Please unscramble as many words as you can in five minutes.

Please write your answer beside each anagram.

They may be completed in any order.

- | | |
|-----------|-----------|
| 1. ELDFI | 26. MOBLO |
| 2. HMOU | 27. OOB |
| 3. NIPLA | 28. ZOEON |
| 4. UDOLC | 29. ELEHC |
| 5. LITAD | 30. DHOUN |
| 6. GEHDE | 31. ANIRG |
| 7. YEHNO | 32. EPSEH |
| 8. AALEG | 33. URVIS |
| 9. RSEGO | 34. DIRFO |
| 10. ASSIO | 35. DIRAP |
| 11. RTEOT | 36. FICLF |
| 12. TDICH | 37. SHARM |
| 13. ARLOF | 38. SHARM |
| 14. EECRK | 39. CIBRH |
| 15. ETLNI | 40. LKSTA |
| 16. RWAET | 41. RLEPA |
| 17. COARN | 42. GUNFI |
| 18. UTFRI | 43. DNIWY |
| 19. ERGAP | 44. HKRAS |
| 20. OCFLK | 45. PMTSU |
| 21. RAPWN | 46. OAKLA |
| 22. TIHGL | 47. VAENR |
| 23. APSYN | 48. UPPPY |
| 24. HOUGB | 49. ROEHN |
| 25. KRUTN | 50. RAETH |

TOTAL CORRECT =

APPENDIX C

THE TEN MINUTE ANAGRAM SOLVING TEST

CODENAME:

SEX: M or F (Circle one)

LAB:

An anagram is a series of letters which can be unscrambled to form a word.

This is an example of an anagram:

EXAMPLE: DGEIR

ANSWER: RIDGE

All anagrams in this test are common five letter words which have a 'nature' theme.

Please unscramble as many words as you can in the time given.

Please write your answer beside each anagram.

They may be completed in any order.

Your team goal is to complete 300 anagrams in 10 minutes.

Your individual goal is to complete 30 anagrams in 10 minutes.

- | | |
|-----------|------------|
| 1. ELDFI | 26. MOBLO |
| 2. HMOUT | 27. OOB RM |
| 3. NIPLA | 28. ZOEON |
| 4. UDOLC | 29. ELEHC |
| 5. LITAD | 30. DHOUN |
| 6. GEHDE | 31. ANIRG |
| 7. YEHNO | 32. EPSEH |
| 8. AALEG | 33. URVIS |
| 9. RSEGO | 34. DIRFO |
| 10. ASSIO | 35. DIRAP |
| 11. RTEOT | 36. FICLF |
| 12. TDICH | 37. SHARM |
| 13. ARLOF | 38. SHARM |
| 14. EECRK | 39. CIBRH |
| 15. ETLNI | 40. LKSTA |
| 16. RWAET | 41. RLEPA |
| 17. COARN | 42. GUNFI |
| 18. UTFRI | 43. DNIWY |
| 19. ERGAP | 44. HKRAS |
| 20. OCFLK | 45. PMTSU |
| 21. RAPWN | 46. OAKLA |
| 22. TIHGL | 47. VAENR |
| 23. APSYN | 48. UPPPY |
| 24. HOUGB | 49. ROEHN |
| 25. KRUTN | 50. RAETH |

TOTAL CORRECT =

My score is :

My team score is:

My team average is:

I am above/ below/ on target (Circle one answer)

My team is above/ below/ on target (Circle one answer)

- | | |
|-----------|-----------|
| 1. PEPLA | 26. HAELW |
| 2. VILEO | 27. LETES |
| 3. LEHLS | 28. STOAC |
| 4. TOOHS | 29. MAPWS |
| 5. NIBRO | 30. ODOFL |
| 6. CEBHE | 31. BURHS |
| 7. TRUTO | 32. RYBER |
| 8. VREIR | 33. SEMOU |
| 9. ESREC | 34. LORAC |
| 10. NAGRE | 35. LATEP |
| 11. LOTAL | 36. IKUAR |
| 12. GROEG | 37. AGLEE |
| 13. NECOA | 38. IRGOC |
| 14. RCSBU | 39. LESWL |
| 15. STEAB | 40. SLSHU |
| 16. PELOS | 41. EONTS |
| 17. STORF | 42. AUFNA |
| 18. LDUOM | 43. NILUP |
| 19. GIERT | 44. OSGOE |
| 20. SYBSA | 45. KANSE |
| 21. CEAHP | 46. OROBK |
| 22. MATES | 47. HEABC |
| 23. BRZEA | 48. NAPLT |
| 24. DQUSI | 49. PIHDA |
| 25. HHETA | 50. TEWHA |

TOTAL CORRECT =

APPENDIX D

Table D-1. A One Factor ANOVA for Self Efficacy Strength and Educational Attainment¹⁰

| Source | <i>df</i> | Sum of Squares | Mean Square | <i>F</i> -Test |
|-------------------|-----------|-------------------|----------------|----------------|
| Between groups | 2 | 33.473 | 16.737 | 5.252* |
| Within groups | 114 | 363.296 | 3.187 | |
| Total | 116 | 396.769 | | |

* = $p \leq 0.01$

Table D-2. Means and Standard Deviations of Self Efficacy Strength for Three Groups of Subjects With Differing Levels of Educational Attainment¹¹

| Group | Count | Mean | Std.Dev |
|------------|-------|------|---------|
| UE | 38 | 3.31 | 1.596 |
| Bursary | 69 | 4.01 | 1.906 |
| University | 10 | 5.3 | 1.567 |

¹⁰Calculated on CLR ANOVA on a Macintosh computer.

¹¹Calculated on CLR ANOVA on a Macintosh computer.

APPENDIX E

Table E-1. A One Factor ANOVA for Self Efficacy Level and Educational Attainment¹²

| Source | <i>df</i> | Sum of Squares | Mean Square | <i>F</i> -Test |
|----------------|-----------|----------------|-------------|----------------|
| Between groups | 2 | 140.343 | 70.172 | 1.04 |
| Within groups | 114 | 7691.964 | 67.473 | |
| Total | 116 | 7832.308 | | |

Table E-2. Means and Standard Deviations of Self Efficacy Level for Three Groups of Subjects With Differing Levels of Educational Attainment¹³

| Group | Count | Mean | Std.Dev |
|------------|-------|--------|---------|
| UE | 38 | 19.158 | 8.005 |
| Bursary | 69 | 20.42 | 8.545 |
| University | 10 | 23.3 | 6.29 |

¹²Calculated on CLR ANOVA on a Macintosh computer.

¹³Calculated on CLR ANOVA on a Macintosh computer.

APPENDIX F

Table F-1. A One Factor ANOVA for Self Efficacy Strength and Stage of Education¹⁴

| Source | <i>df</i> | Sum of Squares | Mean Square | <i>F</i> -Test |
|----------------|-----------|----------------|-------------|----------------|
| Between groups | 2 | 33.538 | 16.769 | 5.713** |
| Within groups | 168 | 493.105 | 2.935 | |
| Total | 170 | 526.643 | | |

* * = $p \leq 0.005$

Table F-2. Means and Standard Deviations of Self Efficacy Strength for Stage One University Students, Stage Two University Students and Sixth and Seventh Form College Students¹⁵

| Group | Count | Mean | Std.Dev |
|-----------|-------|------|---------|
| Stage One | 59 | 3.76 | 1.745 |
| Stage Two | 55 | 4.81 | 1.701 |
| College | 57 | 4.49 | 1.692 |

¹⁴Calculated on CLR ANOVA on a Macintosh computer.

¹⁵Calculated on CLR ANOVA on a Macintosh computer.

APPENDIX G

Table G-1. A One Factor ANOVA for Self Efficacy Level and Stage of Education¹⁶

| Source | <i>df</i> | Sum of Squares | Mean Square | <i>F</i> -Test |
|----------------|-----------|----------------|-------------|----------------|
| Between groups | 2 | 537.572 | 268.786 | 4.32* |
| Within groups | 168 | 10453.773 | 62.225 | |
| Total | 170 | 10991.345 | | |

* = $p \leq 0.05$

Table G-2. Means and Standard Deviations of Self Efficacy Level for Stage One University Students, Stage Two University Students and Sixth and Seventh Form College Students¹⁷

| Group | Count | Mean | Std.Dev |
|-----------|-------|--------|---------|
| Stage One | 59 | 20.254 | 8.216 |
| Stage Two | 55 | 24.473 | 7.086 |
| College | 57 | 23.193 | 8.267 |

¹⁶Calculated on CLR ANOVA on a Macintosh computer.

¹⁷Calculated on CLR ANOVA on a Macintosh computer.

APPENDIX H

Table H-1. The AB Incidence Table¹⁸

| Size | Individual | Group | Total |
|---------------|------------|--------|--------|
| High | 22 | 40 | 62 |
| Self Efficacy | 10.455 | 21.914 | 22.145 |
| Low | 35 | 40 | 75 |
| Self Efficacy | 11.55 | -8.01 | -1.387 |
| Totals | 57 | 80 | 137 |
| | 12.456 | 6.988 | 9.263 |

¹⁸Calculated on Statview 512 on a Macintosh computer.

APPENDIX I

Table I-1. The AC Incidence Table¹⁹

| Target | Above | Below | Totals |
|---------------|-------|--------|--------|
| High | 25 | 37 | 62 |
| Self Efficacy | -0.51 | 32.42 | 22.145 |
| Low | 30 | 45 | 75 |
| Self Efficacy | 7.367 | -3.83 | -1.387 |
| Totals | 55 | 82 | 137 |
| | 3.982 | 12.805 | 9.263 |

¹⁹Calculated on Statview 512 on a Macintosh computer.