

AN ABSTRACT OF THE THESIS OF

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Title: Effects of False Positive and False Negative Feedback on Self-Efficacy  
and Performance of Low and High Self-Esteem Experienced Weight Lifters

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Vern Dickinson

The purpose of this study was to determine the effects of false positive and false negative feedback upon the self-efficacy and performance of high and low self-esteem experienced weight lifters. Among a group of volunteers, 65 experienced male weight lifters were classified as either high or low self-esteem following administration of the Global Self-Worth Scale (Neemann & Harter, 1986). Each was qualified by the ability to perform a one repetition-maximum (1RM) bench press between 200 to 350 lbs., which was tested through a series of trials. Self-efficacy estimates for the 1RM bench press were obtained throughout the experiment. Trial sessions were accompanied by manipulated feedback, providing the subjects with either actual, inflated, or deflated values of weights lifted.

High and low self-esteem subjects performed tasks differently with respect to the type of feedback received. During the first manipulative treatments, high self-esteem subjects lifted greater weights after receiving false positive feedback and lesser weights after receiving false negative feedback. At all times, low self-

esteem subjects did not perform differently after the receipt of either false positive or false negative feedback.

An analysis of the self-efficacy data demonstrated that predictions for 1RM bench press performances were not influenced by levels of self-esteem. However, both high and low self-esteem subjects predicted that they would lift greater or lesser weights following the administration of, false positive or false negative feedback, respectively, and both groups of subjects predicted there would be no weight differences following administration of actual feedback.

Correlation analyses, conducted to determine relationships between self-efficacy and performance, indicated that during the first day of manipulative feedback treatment there was a positive relationship between self-efficacy and subsequent performance change. Previous performance change and subsequent self-efficacy change were correlated only for high self-esteem subjects during day 2 of the treatment. A regression analysis revealed that self-efficacy change was a better predictor of subsequent performance change than previous performance change.

In conclusion, false positive feedback increased self-efficacy and performance of high self-esteem subjects. False negative feedback showed no significant change for either low or high self-esteem subjects.

**Effect of False Positive and False Negative Feedback on Self-Efficacy and  
Performance of Low and High Self-Esteem Experienced Weightlifters**

by

**Naruepon Vongjaturapat**

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# Effects of False Positive and False Negative Feedback on Self-Efficacy and Performance of Low and High Self-Esteem Experienced Weight Lifters

## CHAPTER 1

### INTRODUCTION

For athletes, confidence bears an important relationship to successful sport performance. High level or advanced players usually perform with higher degrees of confidence than lower level players. However, players who achieve similar levels of performance may perform differently, dependent upon when, where, and with whom they are performing. In most cases this indicates that, in relation to specific situations, confidence is an important performance consideration. Bandura (1977a) proposed the self-efficacy theory as an explanation of fluctuations in confidence as related to various performance outcomes. Self-efficacy was defined as a personal belief in the ability to perform specific tasks, subject to possession of adequate incentive and the required performance skills.

Bandura (1977a,1982) also claimed that self-efficacy could be used as an accurate predictor of performance. Moreover, self-efficacy expectations were determining factors in the choice of activity, the amount of effort, and the degree of persistence applied to tasks at hand. Thus, on the one hand, individuals devote greater effort and persistence to those tasks they feel capable of executing, and, on the other hand, tasks they feel incapable of executing are avoided or given less

time or effort. These are principles which can obviously be applied to sport and physical performance.

Though the initial emphasis in self-efficacy theory was directed at high-risk tasks or avoidance behaviors, this theory has also been applied to other areas of behavioral change. These include: health (Kaplan, Atkins, & Reinsch, 1984), achievement (Kendrick, Craig, Lawson, & Davidson, 1982), career choice and development (Betz & Hackett, 1981), sport and physical performance (Feltz, 1982; Feltz, Landers, & Raeder, 1979; Fitzsimmons, Landers, Thomas, & van der Mars, 1991; McAuley, 1985), and fine motor tasks (Mueller, 1992). Since the development of self-efficacy theory, it has been among the primary bases for the investigation of self-confidence in sport and motor performance (Feltz, 1988b). These studies have been categorized in two general areas: a) the relation between self-efficacy and performance and b) changes in performance in relation to the alteration of self-efficacy through application of different sources of information (Fitzsimmons, 1989).

According to Bandura's theory of self-efficacy, expectations are derived from four sources of information: performance accomplishments, vicarious experiences, verbal persuasion, and emotional arousal. Performance accomplishments (i.e., actual experience of success) provide both the most influential and most dependable information on self-efficacy (Bandura, 1977a, 1986). When individuals achieve expected levels of performance, the result is an increase in a sense of self-worth and self-esteem (Feltz & Weiss, 1982). Therefore, performers gain confidence that the expected performance can be repeated. For example, when an individual learns to lift one repetition maximum (1RM) in the bench press (i.e., the maximum amount of weight that an individual can lift in one repetition), actual practice with a successful outcome produces confidence that the target weight can be lifted.

However, successful performance cannot always be accomplished in novel skill learning activities. Thus, Bandura (1977a) proposed vicarious experience as the second source of self-efficacy. By watching others perform at given levels of skill, an individual can feel confident of acquiring those skills. The advantage of watching others perform high-risk or new skills is that observation can reduce feelings of fear, thus providing evidence that the observer can perform the activities in question. Demonstration or modeling, which are examples of vicarious experience, are techniques normally used in classroom sport skill teaching or in coaching situations. The positive effects of these techniques have been confirmed in a number of sport psychology studies (Gould & Weiss, 1981; McAuley, 1985; Weinberg, Gould, & Jackson, 1979).

Emotional arousal, as a source of efficacy expectations, usually produces physiological changes (e.g., an increased heart rate). Cognitive appraisal of these physiological changes produces information relative to self-efficacy and consequently may also result in changed behaviors. In other words, individuals judge their capabilities in terms of the physiological changes they are experiencing. However, when compared to the effect of perceived physiological changes, actual physiological changes have not been found to be good predictors of either self-efficacy or performance (Feltz, 1982; Feltz & Mugno, 1983; Mandler, Mandler, & Uviller, 1958).

Coaches and physical education teachers also use verbal persuasion to enhance player or student performances. However, this method exercises less influence than performance accomplishments or vicarious experiences. Nonetheless, certain statements that coaches or teachers make to players or students may serve to encourage them to perform in accordance with desired outcomes (Fitzsimmons et al., 1991). Performance deception, a technique used in situations where individuals have ceased progress or have come to doubt their ability to perform, is

normally used as a technique of verbal persuasion to cope with this “mindset.” However, the effects of deception techniques have not been examined thoroughly in sport psychology studies (Fitzsimmons, 1989).

Insofar as the current study has utilized performance deception as an influence on self-efficacy in relation to sport performance, several studies which have demonstrated that performance deception has an effect upon subsequent performance are reviewed, including those conducted by Morgan (1981), Nelson and Furst (1972), Ness and Patton (1979), Vidacek and Wishner (1971, 1972), Weinberg et al., 1979, Weinberg, Yokenson, and Jackson (1980), and Weinberg, Gould, Yukenson, and Jackson (1981). In particular, the studies conducted by Weinberg and his colleagues have clearly demonstrated the effect of performance deception upon subsequent performance.

Weinberg et al. (1979) manipulated their subjects, causing them to believe that they were competing against either stronger or weaker opponents in a leg muscle endurance physical task. Results indicated that the subjects who were told that they were competing against weaker opponents (high self-efficacy) performed at higher levels of endurance than the subjects who were told that they were competing against stronger opponents (low self-efficacy). However, since the subjects were placed face-to-face while performing the tasks, in addition to performance deception, factors such as persistence may have also determined efforts to sustain prolonged endurance performances.

Thus, to eliminate the persistence cues disclosed in the previous study, Weinberg et al. (1980) used the same paradigm for a second study, with the exception that the endurance exercises were conducted as back-to-back competitions. This factor eliminated subject's vicarious experiences as they witnessed efforts of competitors. This second study revealed results which were in certain respects similar to those obtained in the initial study. High efficacy subjects con-

tinued to perform better in muscular endurance tasks, but weaker relationships were demonstrated between self-efficacy and performance. They concluded that weaker relationships between self-efficacy and performance occurred when vicarious experiences (i.e., witnessing each other complete the task) were eliminated.

In 1981, Weinberg et al. included an additional variable to determine if pre-existing task-specific, self-efficacy had an effect upon muscular endurance tasks. Subjects were initially classified as either high or low for pre-existing task-specific, self-efficacy by asking the subjects to predict how well they would perform the assigned task. Subjects were then assigned randomly to either high or low manipulated treatment groups for the purpose of competing in two leg endurance trials. Efficacy was manipulated by requiring each subject to compete against either subjects who were identified as track athletes or as athletes who had suffered knee injuries. The results were similar to those obtained from the two previous studies. They determined that both pre-existing and manipulated efficacy influenced muscular endurance performance. However, the effects for each variable were dependent upon the order of trials performed. Pre-existing self-efficacy affected performance only during the initial trial, whereas manipulated self-efficacy exercised an effect only during the second trial. It was thus concluded that initial self-efficacy influenced only initial trials, whereas manipulated self-efficacy exercised an influence upon subsequent trials only after information on competitor subjects and task difficulty were gained.

The results obtained by Weinberg et al. (1979, 1980, 1981) demonstrated that self-efficacy could be modified by the input of various sources of information, and that performance deception was an effective technique for the modification of self-efficacy and subsequent performance.

Nelson and Furst (1972) used a persuasion technique to examine the relationship between expectations and subsequent athletic performances. Persuasion encompasses performance deception as well as verbal persuasion (Fitzsimmons, 1989). Weaker subjects, when persuaded that they were stronger than their opponents, competed successfully in arm strength trials 83 percent of the time. Studies conducted by Mahoney and Avenier (1977) and Ness and Patton (1979) arrived at similar results. In the latter study, a majority of subjects were able to attain maximum weight lifting performance when told that the loads lifted were lighter than the actual weights used.

Recently, a study conducted by Fitzimmons et al. (1991) tested for the relationship of self-efficacy to both performance deception and physical performance. They applied performance deception paradigms similar to those cited by Morgan (1981) and used by Ness and Patton (1979). False information feedback, when used as a performance deception technique, directly impacted self-efficacy and subsequent performance for a 1RM bench press. The subjects who were told that they lifted weights which were heavier than those actually lifted (i.e., false-positive feedback) tended to lift heavier weights in subsequent trials; subjects who were told that they lifted weights which were lighter than those actually lifted (i.e., false-negative feedback) were able to lift only the same or lighter weights in subsequent trials. Performance deception, then, had an effect upon targeted tasks.

For motor skills performance, the effects of individual differences on self-efficacy among subjects was initially recognized by Weinberg et al. (1981). They sought to determine the relationships between self-efficacy, the effects of pre-existing general and task-specific self-efficacy, and subsequent performance. However, self-esteem, as a global evaluation of the self, was not measured, though it was considered to be a variable with possible pertinence to both



performance deception and physical performance. More recently, Mueller (1992) investigated the influence of pre-existing general self-efficacy on motor skills performance. Specifically, Weinberg et al. employed pre-existing task specific self-efficacy by asking subjects how well they believed they would perform assigned tasks, whereas Mueller sought to determine levels of general self-efficacy by administering the Physical Self-Efficacy Scale, an instrument for measuring an individual's physical self-efficacy in sport. Those subjects who were either in high or low physical self-efficacy scale ranges did not perform motor skills with any significant degree of difference. This result supported the Bandura theory that self-efficacy was a specific construct and general pre-existing beliefs would have no significant effect upon fine motor skills performance.

Global self-esteem is a personality variable that has attracted the interest of psychologists over a long period of time (Smith & Smoll, 1990; Swann, 1985; Wylie, 1979). Thus, a number of investigative hypotheses have focused upon self-esteem both as an initiator and as a mediator of human behaviors (Harter, 1986). These hypotheses are based upon the theory that individual behaviors reflect efforts to protect the individual's sense of self-esteem (Elliott, 1986). Thus, individuals who differ in self-esteem are expected to react differently to the techniques of performance deception. Although studies have been designed to explain the relationships between individual differences, self-efficacy, and physical performance (Fitzsimmons et al., 1991; Mueller, 1992; Weinberg et al., 1981), little attention has been devoted to the effect of different levels of self-esteem upon these same variables.

The present study was designed to measure the effects of individual differences (i.e., indicated by individual levels of self-esteem), performance deception, and self-efficacy upon sports performance. Levels of self-esteem, based upon global self-worth scores, were used to classify subjects into high and low self-

esteem classifications prior to administration of the treatment. Previously, Baumeister and Tice (1985) suggested that individual differences, as indicators of attention and self-representation, would affect subsequent physical performance. Thus, for the present study, it was hypothesized that high self-esteem individuals would base their self-representation upon an appreciation of personal abilities, strengths, and good qualities, in contrast to low self-esteem individuals who would tend to focus upon personal deficiencies, weaknesses, and less desirable qualities. Therefore, individual subjects who perceived themselves differently could be expected to react in accordance with the information received during physical trials. Specifically, the present study has sought to determine the effects of false information feedback (information indicating that subjects are lifting either greater or lesser weights than actually lifted) upon 1RM bench press performance of subjects who manifest different levels of self-esteem.

### Statement of the Problem

The primary purpose of this study was to determine the effects of false positive and negative feedback upon self-efficacy and subsequent physical task performance. The following specific problems were investigated:

- 1) The effect of false positive and false negative feedback upon self-efficacy and performance of a 1RM bench press among experienced weight-lifters classified as high and low levels of self-esteem; and
- 2) The predictive value of self-efficacy and previous performance on subsequent performances among experienced weight lifters.

### Assumptions of the Investigation

The present study was based upon the following assumptions:

- 1) All responses to the Global Self-Worth scale (the self-esteem scale) and 1RM-EM were true for the purposes of this study.
- 2) Subjects performed to the best of their abilities at the time of testing.
- 3) The research sample was the representative of an experienced weight lifting population.

### Limitations of the Study

The following limitations were acknowledged for the present study:

- 1) The validity of subject responses to the Global Self-Worth scale items and performance of the 1RM-EM tests could not be controlled.
- 2) The effect of fatigue, insufficient rest, and general physical disadvantages experienced prior to testing upon performance could not be controlled.

### Delimitations of the Study

- 1) The present study was conducted at Oregon State University, Corvallis, Oregon, during the summer term, 1992.
- 2) The sample size of the study included 65 male volunteer subjects selected in accordance with degrees of high and low self-esteem

among the subjects, as determined by scored responses to the Global Self-Worth scale (Neemann & Harter, 1986).

- 3) The 1RM-EM (Fitzsimmons, 1989) was employed to measure subject efficacy expectations during 53 bench press performance.

### Research Hypotheses

The following research hypotheses were evaluated for the present study:

- Hypothesis 1: There will be significant differences in performance and self-efficacy expectations between subjects with, respectively, high and low self-esteem.
- Hypothesis 2: There will be significant differences in performance and self-efficacy expectations between subjects who receive, respectively, false positive, false negative and actual feedback.
- Hypothesis 3: False positive feedback will have an effect upon self-efficacy and performance among high self-esteem subjects.
- Hypothesis 4: False negative feedback will have an effect upon self-efficacy and performance among high self-esteem subjects.
- Hypothesis 5: False positive feedback will have an effect upon self-efficacy and performance among low self-esteem subjects.
- Hypothesis 6: False negative feedback will decrease self-efficacy levels and performance among low self-esteem subjects.

### Definition of Terms

For the purposes of this study, the following terms are defined:

*Experienced weight lifter:* Any individual who has lifted weights recreationally and regularly for at least two years; and whom also regularly lifts weights at least two times each week.

*False negative feedback:* The utilization of techniques of manipulation to modify self-efficacy levels among performers. Subjects are provided with information indicating lower levels of performance than actually attained.

*False positive feedback:* Similar to false negative feedback, with the exception that subjects are provided with information indicating higher levels of performance than actually attained.

*Global self-worth:* A subscale of the Self Perception Profile directed at individual general feelings about the self. This subscale consists of six items, for which scores range from 24 (highest) to 6 (lowest), assessed by such items as liking the kind of person the subject has become or liking the type of life the subject leads (Neemann & Harter, 1986).

*High self-esteem:* Subjects who scored between 20 to 24 on the Global Self-Worth scale were classified as high self-esteem for the purposes of this study.

*Low self-esteem:* Subjects who scored between 6 to 18 on the Global Self-Worth scale were classified as low self-esteem for the purposes of this study.

*One repetition–maximum efficacy measure (1RM-EM):* The self-efficacy measure used in this study for the assessment of self-efficacy expectations for 1RM bench press weight lifting (Fitzsimmons, 1989).

*One repetition–maximum (1RM):* The maximum amount of weight (in pounds) that a subject can lift in one repetition (Fleck & Kraemer, 1987), using the universal bench press machine.

*Performance deception:* Manipulative treatment which causes the performer to believe they have achieved success or failure during a particular performance.

*Self-efficacy:* A situation-specific form of self confidence that is dependent upon the task, situation, or previous experience of the individual (Bandura, 1977a); the belief that one can successfully perform in accordance with desired behaviors.

*Self-esteem:* A global evaluation of self that is measured by the degree to which the individual endorses various positive evaluative statements about the self (Baumeister & Tice, 1985).

*Self-Perception Profile for College Students:* A standard test for the classification of self-esteem among college students, consisting of 12 subscales and a Global Self-Worth subscale (Neemann & Harter, 1986) .

## CHAPTER 2

### REVIEW OF LITERATURE

The relationship between participation in sport and the development of self-confidence is an issue of primary concern to physical educators and coaches (Feltz & Weiss, 1982). Specifically, self-confidence is considered to be a necessary quality for successful sport performance (McAuley & Gill, 1983). Thus, physical educators and coaches have sought to understand the importance of self-confidence, the techniques that can be used to enhance self-confidence, and the influence of individual differences upon self-confidence. To develop logical concepts relevant to this area of concern, a review of literature is presented in the following sections: self-efficacy theory, enhancement of self-efficacy, measurement of self-efficacy, criticisms of self-efficacy theory, relationships between self-efficacy and sport performance, deception in physical activity and sport performance, and influence of self-esteem on response to feedback.

#### Self-Efficacy Theory

Self-efficacy is the primary theory employed for the investigation of self-confidence in sport and motor skills performance, and has thus been broadly investigated (Feltz, 1988b; Gayton, Matthew, & Burchstead, 1986). The theory of self-efficacy was proposed by Bandura (1977a) in explanation of the relationships between cognitive beliefs and behavioral changes. Bandura stated that most be-

havioral changes are due to common cognitive mechanisms in which individual beliefs lead to the behaviors required to produce certain outcomes. However, as applied to sports or motor skills performance, self-efficacy does not refer to overall performance, but rather to situation-specific self-confidence. In this sense, self-efficacy changes as the task, situation, or previous experience of the individual is changed.

Self-efficacy can be used as an accurate predictor of performance (Bandura, 1977a; Bandura & Adams, 1977; Bandura, Reese, & Adams 1982). However, the accurate prediction occurs only when both adequate incentives and appropriate levels of skill are present. Thus, individuals with adequate skill levels may yet fail to perform well if they lack incentives to perform. Similarly, subjects with high incentives will not produce new levels of performance if they have not prepared skills adequate for the task. Moreover, it has also been demonstrated that the presence of incentives may affect levels of motivation without at the same time influencing levels of performance.

Self-efficacy is a determinant of behavior, thought patterns, and emotional reactions in taxing situations (Bandura, 1986). Self-efficacy influences the choice of activities, the amount of effort expended, and the persistence necessary to complete tasks. In effect, individuals choose to participate in those activities in which they are confident of their abilities. On the other hand, individuals tend to avoid tasks they believe to be beyond their capabilities (Bandura, 1977a, 1982). Thus, according to Bandura, individuals seek success and avoid failure, and time spent on tasks is dependent upon their self-efficacy. If they have high levels of confidence for given activities, then their effort and persistence toward such tasks will be vigorous. This judgment effect has been confirmed from the results of several studies (Bandura & Cervone, 1983; Brown & Inouye, 1978; Schunk, 1984; Weinberg et al., 1979). Therefore, a strong belief in their capabilities helps



individuals perform challenging tasks, whereas doubt of their capabilities tends to lessen the efforts and persistence individuals will devote to tasks.

In addition, individual judgments of personal capabilities can serve to influence thought patterns and emotional reactions (Bandura, 1986). Individuals with a strong sense of efficacy view difficult tasks more positively and devote greater effort to them than do low self-efficacy individuals. The former, unlike low-efficacy individuals, may attribute their failures to insufficient effort rather than insufficient ability. Among individuals with low self-efficacy, task performance can be influenced by increased anxiety and arousal (Feltz & Doyle, 1981). Thus, self-efficacy may affect performance and behavioral changes both positively and negatively, according to diverse influences. To the degree that individuals can enhance their self-efficacy, they may be able to perform more effectively in a variety of activities.

### Enhancement of Self-Efficacy

Four principal sources of information can be used to enhance self-efficacy, including performance accomplishment, vicarious experience, verbal persuasion, and physiological or emotional arousal (Bandura, 1977a, 1986). However, these sources of information do not exercise equal effects upon performance. In addition, self-efficacy and performance may be influenced by one or more of these sources of efficacy information. The relationship between these sources of information and performance is diagrammed in Figure 2.1.

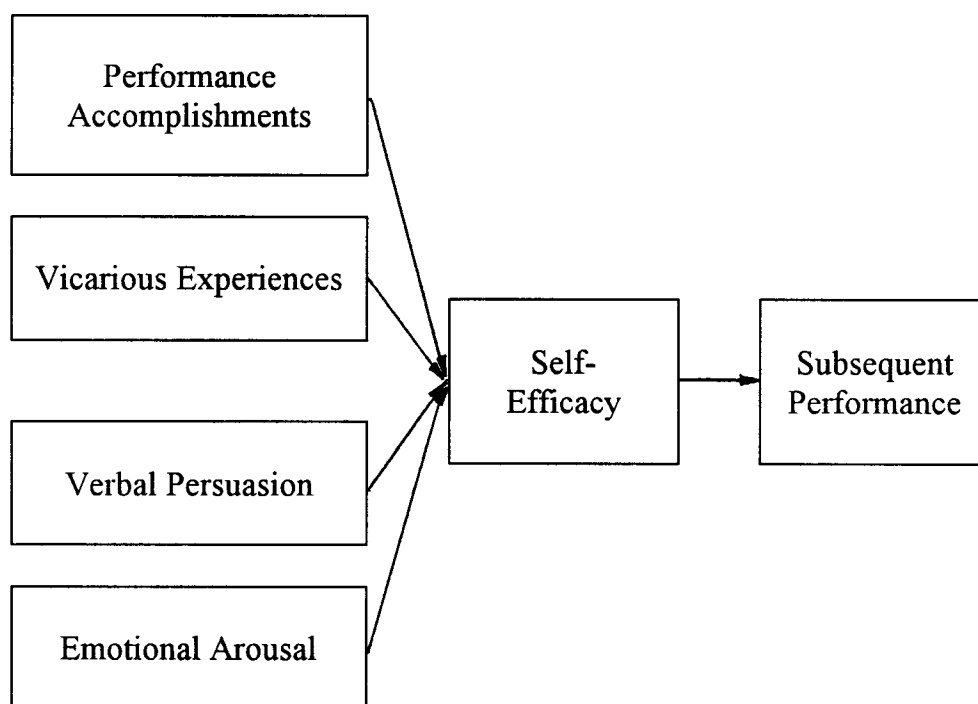


Figure 2.1. Four Sources of Efficacy Information, Self-Efficacy, and Subsequent Performance Relationships.

### Performance Accomplishments

Performance accomplishments constitute the strongest and most dependable sources of self-efficacy because this information is based on actual experiences. Individuals often enjoy feelings of success and self-worth (Gould & Weiss, 1981) after achieving an optimum level of performance. Thus, success serves to raise mastery experience, whereas failure serves to lower the same quality (Bandura, 1977b). However, following the development of self-efficacy through repeated successes, an occasional failure is less likely to influence performance (Bandura, 1986). Thus, to the greatest degree possible, the provision of successful experiences and the elimination of failures are key factors in the enhancement of self-efficacy. The various modes of efficacy induction that can help performers achieve their own direct experiences include participant

modeling, performance desensitization (i.e., progressive involvement in threatening activities or situations), performance exposure (i.e., procedural involvement in massive to aversive events), and self-instructed performance. The effectiveness of these performance-based techniques has been supported by results obtained from studies in clinical psychology (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977) as well as studies of sport performance (Feltz et al., 1979, Lewis, 1974; McAuley, 1985; Weinberg, Sinaidi, & Jackson, 1982).

Feltz et al. (1979) and McAuley (1985) each compared different modeling types relative to their ability to increase efficacy and improve performance. Feltz and his colleagues compared participant modeling to live and videotaped modeling, during which subjects learning the back dive. In participant modeling, the model physically guides learners while they are performing. McAuley used participant modeling, live modeling and a control condition for subjects who learned a dive roll mount for the balance beam. In each study, it was found that participant modeling was the most effective technique for the enhancement of both increased self-efficacy and performance. From the results obtained by Feltz et al., it was speculated that successful performances, as patterned upon participant modeling, served to enhance self-efficacy, which in turn influenced performance levels.

### Vicarious Experience

Vicarious experiences, or information gained from observing others perform, also influence the observer's feelings of capability and exercise at least a partial influence upon self-efficacy (Bandura, 1986). For high-risk or novel tasks, watching others successfully perform can raise the self-efficacy of the observer relative to task performance. However, vicarious experiences do not influence

performance to the same degree as actual performance accomplishments. Rather, these experiences effectively reduce levels of fear, persuading observers that they can perform just as those observed have done. In addition, observing models who are similar in sex, age, and previous experience has demonstrated a stronger positive effect upon observers than when dissimilar models are observed (Gould, & Weiss, 1981; McCullaugh, 1987, Schunk & Hanson, 1985). For example, Schunk and Hanson determined that a peer model had more effect upon the self-efficacy of children than a teacher model for the performance of math tasks. Nonetheless, dissimilar or unfamiliar models, to the degree the models possess the required performance skills, can also improve observer performances (Lirgg & Feltz, 1991).

For modeling, Bandura (1977b) presented two modes of efficacy induction: live modeling and symbolic modeling (or that based upon forming images of others engaged in a task). In physical education classes, live modeling is normally used to demonstrate high-risk or novel motor tasks such as those used in the development of gymnastics skills. In contrast, symbolic modeling is more generally used in areas of clinical psychology (Kazdin, 1979) or in sport for such activities as learning the back dive (Feltz et al., 1979; Gould & Weiss, 1981; McAuley, 1985).

### Verbal Persuasion

Most physical educators and coaches employ general methods of verbal persuasion in teaching/coaching situations as frequently as they do modeling techniques. The means of verbal persuasion are readily available in most every situation and, as successfully applied, can be a tool which leads individuals to have confidence even when they have failed (Bandura, 1977b). This technique

seems best for those individuals who have reached a barrier to further performance improvement, or to others who have recently recovered from injuries (Fitzsimmons, 1989). When individuals become stuck at a given level of performance, or otherwise fail to pass through a performance plateau, they tend to lose confidence. This also occurs among injured athletes who are returning to practice or competition (Weiss & Troxel, 1986). However, verbal persuasion has less effect upon behavior than the sources of information considered in the previous two sections. The effect of modes of verbal persuasion such as suggestion, self-instruction, or interpretive treatment is likely to be weak and short-lived (Bandura, 1977a). However, this technique is at the same time an appropriate approach to learning or coping with high risk situations.

Performance deception, one of the techniques of verbal persuasion, is frequently used to enhance self-efficacy and subsequent performance in teaching or coaching activities. Deception is normally used when performers cannot routinely improve performance or when they are fearful of experiencing reinjury. This technique is used to hide the actual abilities of performers to the end of building their confidence. It has long been used for training athletes who have reached a performance plateau or who are recovering from injury, but there were no scientific investigations on the effect of this technique until the 1970s.

Vidacek and Wishner (1971, 1972) reported that muscular endurance performance could be enhanced by cognitive manipulations. In the first of these studies, subjects were asked to support a weight for 30 seconds or as long as they could (respectively, short and long tasks). When longer periods of time were demanded, electrical activity of subject's musculature was lower than among subjects who were instructed to work only short periods. In other words, subjects decreased the force of their muscle contractions when expected to work longer. An identical paradigm was employed in the subsequent study, except that task du-

ration was replaced by task difficulty. In this case, anticipation of a difficult task reduced muscle activity while expectation of easier tasks increased it.

In 1966, Morgan, Needle, and Coyne (Morgan, 1981) presented a paper to the American Association for Health, Physical Education, and Recreation which showed subjects who believed they were lifting weights lighter than those actually lifted, were able to lift heavier weights than the targeted values. Ness and Patton (1979) also found an effect of cognitive manipulation for the 1RM bench press. Subjects were able to lift heavier weights when informed that they were lighter than actuality.

### Physiological Arousal

Physiological arousal is the least effective source of information for the enhancement of self-efficacy (Bandura, 1977a; Wurtle, 1986). In several studies, heart rate was measured as an indicator of the physiological state of subjects (Feltz, 1982; Feltz & Mugno, 1983). The results revealed no significant evidence of a self-efficacy/heart rate relationship. However, arousal perception, as measured by the Autonomic Perceived Questionnaire (Mandler et al., 1958), indicated a higher relationship for these two variables during performances. Perceived physiological arousal was a better predictor of self-efficacy and subsequent performance than actual physiological arousal.

Bandura (1977a) stated that arousal affects behavior through cognitive appraisal (i.e., self-efficacy). In other words, individuals provide differing interpretations of physiological states of arousal and anxiety. If physiological arousal was interpreted as a fear, then the individuals in question may not perform well or successfully; if arousal was interpreted as the effects of excitement, then improved performances may result. However, these are interpretations which are

subject to influence by past experiences or the appraisal of the sources of arousal (Bandura, 1982). Therefore, the enhancement of self-efficacy by means of arousal depended on interpretation of physiological arousal. Feltz (1984) concluded that arousal could be reduced through relaxation or the application of bio-feedback techniques, which in turn served to increase self-efficacy and subsequent performance.

### Measurement of Self-Efficacy

Self-efficacy measurement is typically constructed relative to a specific task (Bandura, 1977a). Performance items are often listed in a hierarchy of difficulty wherein the final item is the most difficult. The strength of efficacy is usually estimated on a 100-point probability scale. A rating of 100 points indicates absolute certainty, whereas 10 points indicates uncertainty. In a weight lifting study, for example, the subjects were asked the heaviest weights they felt they could lift at 50, 75 and 100 percent levels of confidence (Fitzsimmons et al., 1991).

In constructing self-efficacy measures, the constructor must understand that self-efficacy differs in level, strength, and generality (Bandura, 1977a). The level of self-efficacy thus refers to an individual's expected performance, whereas the strength of efficacy indicates the confidence that a person can attain a certain performance level. In the study conducted by Fitzsimmons et al. (1991), subjects were asked to rate their expected performance (e.g., how much they could lift), and how confident they were (e.g., 50, 75 or 100 % confident) that they could lift a specific weight. The generality of efficacy refers to the number of areas to which this measure of efficacy can be applied.

### Criticisms of Self-Efficacy Theory

Though the theory of self-efficacy has been applied to issues of self-confidence in sport and physical performance, the theory has also been accorded its share of criticism. Feltz (1984) provided two major criticisms of the theory of self-efficacy. First, self-efficacy ratings are typically based on self-reported measures. Second, anxiety-based theory argues that as performance serves to reduce anxiety, behavior and self-efficacy will increase. Eysenck (1978) considered self-efficacy to be solely a byproduct of reduced anxiety, whereas Bandura (1979a) proposed that high self-efficacy for the execution of a given task would reduce anxiety and thereby increase performance. In this sense, successful performance and reduced anxiety could be determined by efficacy expectations.

Self-efficacy theory has also been criticized on the basis of its causal relationships; that is, whether self-efficacy or past performance are the primary causes of subsequent performances. Several sport studies have been conducted to investigate this causal relationship (Feltz, 1982; Feltz & Landers, 1983; Feltz & Mugno, 1983, McAuley & Gill, 1983). These studies determined that the principal determinant of future performance was not solely self-efficacy, but that future performance was also based upon past performance—findings which stand directly opposite to the Bandura hypothesis that past performance accomplishments affect behavior primarily through self-efficacy.

Feltz (1982) found little support for both self-efficacy and anxiety-based theories. In fact, in back-diving exercises, self-efficacy was neither an effect of past performance nor a predictor of subsequent performance. In this study, Feltz found that self-efficacy was a strong performance predictor only for the first trials conducted. Rather, prior performances influenced future performance to a greater



degree, and predicted performance with greater accuracy than self-efficacy. Though Feltz also observed a reciprocal relationship between self-efficacy and performance, she nonetheless maintained that the relationship between self-efficacy and performance was not an equal balance. Ultimately, performance influenced self-efficacy more than self-efficacy influenced performance.

Poor performance predictions based on self-efficacy may result from the paradigm employed in some studies, particularly those which employ repetitive trials that make it difficult to distinguish the effects of self-efficacy from those of performance (Fitzsimmons, 1989). In certain studies, this was evidenced by the high degree of correlation between the two variables. Thus, individuals who are faced with novel situations may be more affected by self-efficacy. In sport performance situations, this is common. In this sense, self-efficacy may have an important influence upon performance, and a number of studies have confirmed this (Fitzsimmons et al., 1991; Weinberg et al., 1981). Ultimately, Feltz (1984) has stated that self-efficacy is an important and necessary cognitive mechanism in the explanation of motor behaviors, especially with regard to initial performance trials.

### Relations Between Self-Efficacy and Sport Performance

Self-efficacy theory has been widely used to investigate self-confidence in sport and physical activity (Feltz, 1988b). In general, instructors and coaches have come to believe that self confidence is closely related to performance outcomes, and that the enhancement of self-confidence can be correlated with improved performance. In confirmation of this belief, a number of studies have been conducted which have served to confirm the Bandura theory (Barling &

Abel, 1983; Brody, Hatfield, & Spalding, 1988; Feltz, 1982; Feltz & Doyle, 1981; Feltz et al., 1979; Fitzsimmons et al., 1991; Gayton et al., 1986; Gould & Weiss, 1981; Lan & Gill, 1984; Landers & Landers, 1973; Lewis, 1974; McAuley, 1985; McCullaugh, 1987, Weinberg et al., 1981; Weiss, 1983).

Prior to the formulation of self-efficacy theory (Bandura, 1977a), Landers and Landers (1973) conducted one of the first studies relating to modeling and motor behavior. Information on modeling characteristics derived from this study has been widely cited in the field of physical education. The performance of a student peer group on a Bachman ladder was measured in relation to modeling by both skilled and unskilled physical education teachers. The results indicated that observing others perform served to enhance observers' subsequent performances. The subjects who observed skillful teachers model performed better than those who observed unskillful teachers or skillful peer models. In addition, subjects who observed unskillful peer models performed significantly better than subjects who observed skillful peers or unskillful teacher models. A subsequent study reinvestigated and extended these findings, providing results that were partially supportive (Lirgg & Feltz, 1991). In this study, subjects who observed skilled models performed better than subjects who watched unskilled models. In addition, subjects in the unfamiliar skilled group showed higher levels of self-efficacy than did subjects in the control group. It was suggested that with unfamiliar models, the skill was more important than the status.

Feltz & Landers (1977) and Feltz et al. (1979) performed the first studies which tested the role of self-efficacy theory with respect to sport performance. Results indicated that modeling facilitated performance in the cognitive phase of motor learning. Modeling has also been of interest in the area of sport psychology (Feltz, 1982; Feltz et al., 1979; Gould & Weiss, 1981; McAuley, 1985; McCullaugh, 1987; Weiss, 1983). Most of these studies supported self-efficacy

theory, at least to the extent that performers improved when observing others. Feltz and colleagues and McAuley each compared the effectiveness of modeling techniques with respect to performance accomplishments. The former used a modified back-dive as the performance test, whereas McAuley tested the gymnastics dive forward-roll mount onto a balance beam. The findings from both studies were similar. Participant modeling which involved physically guided participants demonstrated stronger self-efficacy and contributed to a greater number of successful performances than other types of modeling or exercises performed by control group subjects.

Gould and Weiss (1981) investigated the effects of similar and dissimilar modeling upon the self-efficacy and muscular endurance of female college students. The models were either female nonathletes (similar) or male varsity track athletes (dissimilar) who provided either positive, negative, or no self-efficacy statements as they demonstrated a leg endurance task. Both self-efficacy and muscular leg endurance performance were increased in the group composed of similar observers. McCullaugh (1987) replicated and extended studies previously conducted by Gould and Weiss (1981), Landers and Landers (1973), and McCullaugh (1986) which had used model similarity to confirm the relationship between self-efficacy and motor performance. Employing the Bachman ladder task, McCullaugh used models who were either highly skilled (dissimilar) or inexperienced (similar). Subjects performed better when they viewed similar models.

Horgan and Santomier (1984) examined the effect of performance accomplishments for an older age group learning swimming skills. The self-efficacy levels of the treatment group were not only significantly higher than the levels within the control group, but members of the treatment group also appeared to be more able to generalize their lessons to other performance-related situations

(e.g., feeling confident enough to join an outdoor trip). A generalizing effect may have occurred here as a result of increased swimming self-efficacy.

### Deception in Physical Activity and Sport Performance

Performance deception, a technique that leads a subject to believe that a particular performance level has been achieved, has been used in a number of studies of physical activity and sport performance (Fitzsimmons, et al., 1991; Mahoney & Avenier, 1977; Nelson & Furst, 1972; Ness & Patton, 1979; Weinberg et al., 1981). From these studies, performance deception shows an apparently strong relationship to performance. Efficacy expectations, as manipulated by performance deceptions, are based only upon two sources of information: performance accomplishments and verbal persuasion (Fitzsimmons, 1989).

Nelson and Furst (1972) examined the effects of performance deception upon arm strength performance. Subjects with clearly different arm strengths were paired, then the subjects were told that the stronger competitors were actually weaker and vice versa. The subjects who were told that they were the stronger of the pairings won the arm strength competitions 83 percent of the time. The results of this study, as well as those of Mahoney and Avenier (1977), supported the concept that performance could be altered through the use of persuasion techniques (i.e., verbal persuasion and performance deception). In addition, Ness and Patton (1979) determined that subjects who believed that they lifted more weight than actually lifted were subsequently able to lift greater weights than members of other groups not exposed to the same technique.

A recent study designed to test the relationships between performance deception, self-efficacy, and athletic performance affirmed the use of performance

deception techniques based upon two sources of efficacy information (Fitzsimmons, 1989). First, individuals were deceived through verbal persuasion into thinking they performed well. Second, performances were improved in the context of the presentation of the means of persuasion. Deception may have exercised a stronger influence here than either persuasion or performance when used as isolated techniques. However, Fitzsimmons (1989) has observed that this technique needs to be used both cautiously and sparingly. If this technique was not subject to appropriate use guidelines, then distrust may have resulted with subsequent harm to the credibility of the teacher/coach. Moreover, deception value must in every case be provided within the ranges of safety for given exercises to avoid injury. Fitzsimmons also conducted a regression analysis of results to determine whether self-efficacy or previous performance was the best predictor of future performance. Feltz and Mugno (1983) had shown previously that improvement in following performances was more likely due to the effects of a previous performance than to either feedback or changes in self-efficacy. Fitzsimmons' analysis revealed that with the exception of the first session, previous experience had the most important influence upon following performances.

Fitzsimmons et al. (1991) found that false information feedback affected self-efficacy and performance of a 1RM bench press. Subjects who were informed that they lifted weights heavier than actually lifted (false positive feedback) tended to lift heavier weights during the following trial. The subjects who were told that they lifted lighter weights than actually lifted (false negative feedback), lifted either equivalent weights or lighter weights during the following trial. From these results, it was obvious that performance deceptions had exercised an important effect upon performance. In addition, for all but the earliest trial sessions, it was determined that past experience had a greater influence upon subsequent performance than self-efficacy. In other words, when individuals

thought they were capable of performing at a certain level following a first successful performance, the next performance level was dependent to a greater extent upon the previous performance than upon self-efficacy. Thus, the findings of this study supported the Bandura self-efficacy theory as follows: a) Verbal persuasion is a source of efficacy information and b) performance accomplishment is a stronger or more reliable source of information.

### Influence of Self-Esteem on Response to Feedback

How personality affects responses has been a persistent topic of interest in psychology (Smith & Smoll, 1990). A great deal of theoretical consideration as well as empirical investigation has been directed toward global self-esteem (Swann, 1985; Wylie, 1979). Baumeister and Tice (1985) defined self-esteem as a global evaluation of the self, measurable by the degree to which the individual endorses various evaluative statements about the self. Self-esteem has been considered to be a reliable factor in individual reactions to negative feedback (Jones, 1973, Kernis, Brockner, & Frankel, 1989; McFarlin, 1984, 1985). Since low self-esteem individuals perceive themselves in a more negative manner than high self-esteem subjects, their motivation and performance after negative feedback are affected significantly (Brockner, 1979; Brockner et al., 1983; Brockner, Derr, & Laing, 1987). In contrast, high self-esteem individuals are not similarly affected by positive feedback (Lorr & Wunderlich, 1988). Moreover, low self-esteem is associated with negative feelings about the self (e.g., dejection, anxiety, and fatigue), whereas high or positive self-esteem is associated with positive feelings (e.g., cheerfulness, energy composure, and enthusiasm).

### Self-Esteem and Positive Feedback

Individuals will generally strive to protect their self-esteem (Elliott, 1986). Thus, when feedback is received that differs from self-perceptions, individuals react differently to this feedback. High self-esteem individuals tend to emphasize their abilities and strengths, and also respond with better or equal performance when presented with positive feedback (Baumeister & Tice, 1985). This behavior can be explained by reference to either self-enhancement or self-consistency theories. Self-enhancement theory is based upon the concept that individuals are motivated to maintain a positive self-concept (Shrauger, 1975). Self-consistency theory states that individuals are motivated to maintain a consistent image (Leckey, 1945; Swann, Griffin, Predmore, & Gaines, 1987). Accordingly, high self-esteem individuals manifest efforts to maintain consistent levels of performance and their positive self-images.

In contrast, low self-esteem individuals demonstrate greater degrees of self-rejection, self-dissatisfaction, and self-contempt (Rosenberg, 1965), placing emphasis upon their deficiencies, weaknesses, and overall bad qualities (Baumeister & Tice, 1985). These individuals react to positive feedback differently than their high self-esteem counterparts. Swann et al. (1987) concluded that individuals with low self-esteem experience a conflict between the enhancement of personal self-worth and maintaining self-consistency. On one hand, they are desirous of enhanced feeling of self-worth, but, on the other hand, are driven to maintain their negative self-view.

Baumeister and Tice (1985) provided two reasons why initial successes may cause disappointment in low self-esteem subjects. First, people with low self-esteem are unlikely to feel confident about transforming an initial success into excellence. Low self-esteem indicates that the individual does not often feel

him or herself to be outstanding. Second, initial success may surpass the initial expectations of someone with low self-esteem. The individual may then not be confident of repeating that success. Moreover, Rothbaum, Weisz, and Snyder (1982), in an interpretation of the principle of “rejection of success,” as developed by Maracek and Mettee (1972) and Mettee (1971), stated that individuals with low self-esteem withdraw after successes, not for the reason that they did not enjoy success, but because they were afraid that an initial success may increase the chance of future failure.

### Self-Esteem and Negative Feedback

Responses to negative feedback by high self-esteem individuals can also be explained by either self-enhancement or self-consistency theory. Baumeister (1982) suggested that individuals with high self-esteem are more likely to engage in compensatory self-enhancement when faced with negative feedback. They subsequently react to failures by seeking to make an extra good impression (or effort), and try harder to maintain or reaffirm their positive self-concept (McFarlin & Blascovich, 1981; Sigall & Gould, 1977). In other words, they try harder because they believe they are good, and they feel strongly about maintaining that self-concept. With respect to self-consistency, they try harder because they want to maintain their image of being respected and accepted by others.

Baumeister and Tice (1985) found that high self-esteem individuals were sensitive to different failure treatments. These subjects performed well after experiencing humiliating failures (as internal attributions), but performed poorly after failures which permitted a certain degree of face-saving (in the form of external attributions). In contrast, after receiving negative feedback, subjects with low self-esteem may perform at lower levels than previously achieved. Moreland



and Sweeney (1984) reported that low self-esteem had a greater negative effect than high self-esteem, especially in response to negative feedback. Moreover, low self-esteem individuals were also less motivated in failure situations than were high self-esteem individuals. Shrauger (1975) and Shrauger & Sorman (1977) concluded that high and low self-esteem individuals affectively desire self-enhancing feedback, but at the same time cognitively accepted self-confirming negative feedback.

To summarize, positive and negative feedback can influence individual behaviors differently, dependent upon the levels of self-esteem of the individuals in question. Variations in reactions can be explained by the self-enhancement and/or self-consistency theories even though inconsistencies have been observed in the results of the studies cited to this effect (Smith & Smoll, 1990).

## CHAPTER 3

### METHODS AND PROCEDURES

For the purpose of investigating the effects of false information feedback on self-efficacy and the performance of a 1RM bench press among college student subjects classified as either high or low in self-esteem, the methods and procedures are considered in the following sections: population and selection of subjects, instrumentation and measures, experimental design, data collection, and treatment of the data (statistical analysis).

#### Population and Selection of Subjects

The 65 subjects who participated in this study were male college students between the ages of 18 to 35 years ( $M = 23.5$  yrs), each with more than two years of weightlifting experience ( $M = 4.93$  yrs). Each of these volunteer subjects had not experienced shoulder injuries, chest surgery, or generalized physical injuries during a six-month period prior to the conduct of trials during summer term, 1992, at Oregon State University, Corvallis, Oregon. Moreover, it was determined that each subject regularly lifted weights at least two days each week ( $M = 4.13$  days/week). The subjects were asked to refrain from the 1RM bench press or physically strenuous exercises during nontesting times for the period the trial sessions were conducted.

Each subject demonstrated the ability to complete a 1RM bench press of from 200 to 350 lbs ( $M = 265$  pounds) using a universal bench press machine (Universal Gym Equipment, Inc., Cedar Rapids, IA), and was subsequently

classified as having either high or low self-esteem. Subjects were randomly assigned to one of three treatment groups. The first and second groups were administered manipulative performance feedback; and the third group was administered actual performance feedback as a control.

The use of subjects for this investigation was approved by the Institutional Review Board for the Use of Human Subjects at Oregon State University (Appendix A). After meeting all the study requirements, each subject received and signed an informed consent form (Appendix B). Each subject was also asked to provide personal information concerning age, gender, height, weight, how often weights were lifted each week, experience with the 1RM bench press, and injury record (Appendix C). A presession information questionnaire relating to subject physical activities 24 hours prior to the scheduled experimental trial days was also administered (Appendix D). With the exception of treatment manipulation information, subjects were informed about the general procedures used to conduct the present study. The subjects then performed a 1RM bench press, using the same procedure that would be employed during the scheduled trial performances.

## Instrumentation and Measures

### Self-Esteem Scale

The Global Self-Worth scale, one of 12 subscales of the Self-Perception Profile (SPP) for College Students (Neemann & Harter, 1986), was used to classify each subject with respect to high or low self-esteem (Appendix E). The SPP is presented in a two-choice question format which forces each subject to decide whether each item statement is true of him/her, and then asks whether the item statement in question is sort of true or very true of him/her. This question format

is designed to eliminate the tendency among subjects to provide socially desirable responses. Each of the SPP subscales is composed of four items, while the Global Self-Worth subscale is composed of six items. Global Self-Worth scale test scores range from 6 to 24, for which the highest scores indicated high self-esteem and the lowest scores indicated low self-esteem.

The SPP for college students has been used in and accepted as valid by several prior studies (McGregor, Mayleben, Buzzanga, Davis, & Becker, 1991; Masciuch, McRae, & Young, 1990). Though only the Global Self-Worth subscale was used for subject esteem classifications (Appendix E), the 12 remaining subscales and the Importance Rating (Appendix F) of the SPP were also included for the purposes of this study. The 12 subscales were job competence, scholastic competence, social acceptance, appearance, parent relationships, close friendships, intellectual ability, morality, romantic relationships, humor, creativity, and athletic competence.

Prior to treatment, each volunteer was classified with respect to high or low self-esteem status in accordance with results obtained from administration of the Global Self-Worth scale. The subjects ( $n=33$ ) who scored between 20 to 24 ( $M = 22$ ,  $SD = 1.464$ ) were considered to be high self-esteem subjects, whereas those subjects ( $n=32$ ) who scored between 12 to 18 ( $M = 17$ ,  $SD = 1.815$ ) were considered to be low self-esteem subjects. The range of Global Self-Worth scores was from 12 to 24.

The number of subjects in each group differed insofar as the intent of the investigator was to minimize mean performance differences among groups prior to administration of the treatment. Thus, 33 high self-esteem subjects were randomly assigned to each of three groups and 9, 12, and 12 high self-esteem subjects were included, respectively, in groups 1, 2, and 3; similarly, the 32 low self-

esteem subjects were also randomly assigned to three groups and 12, 10, and 10 low self-esteem subjects were included, respectively, in groups 1, 2, and 3.

### Self-Efficacy Measurement

The One Repetition–Maximum Efficacy Measure (1RM-EM), as developed and employed by Fitzsimmons (1989), was administered to determine subject self-efficacy expectations (Appendix G). This questionnaire was developed from the Bandura guidelines for the assessment of the three dimensions of efficacy: level, strength, and generality. This measure consists of three questions which ascertain subject confidence levels while performing at specific weights for a 1RM bench press at 50, 75, and 100 percent, respectively. Subjects responded to the questions by providing the value of weight that they believed they could lift in pounds (e.g., 200 lbs).

### One Repetition-Maximum Performance

A universal-type bench press machine (Universal Gym Equipment, Inc., Cedar Rapids, IA) was used for the one repetition-maximum (1RM) performance measure throughout the experiment. This performance measure procedure was based upon the procedure developed by Fitzsimmons (1989). For the bench press, the lifter was required to press the handles from the chest up to the arm-extended position. However, this procedure was completed only when the subject was able to maintain correct body position throughout the trial performance: that is, the head, shoulders, and buttocks remained in contact with the bench. For greater accuracy during bench press performances, the grip width of the handles was also recorded during the introductory session and subsequently rechecked throughout the conduct of the study. Marks were placed on the handles in one-

inch increments. According to Wescott (1983), grip changes over the course of testing sessions can have an effect upon 1RM performance measures.

Data derived from the 1RM bench press performances included the maximum weight value that each subject lifted during a single repetition. Weight plates were hidden from the view of subjects during all trials. A video camera was placed and operated in the testing area to enhance the effect of the manipulative performance deception. To prevent the subjects from understanding that the present study was based upon performance deception manipulation, they were also informed that the principal objectives of the study were the form, process cues, and individual differences demonstrated during press performances. Subjects were also asked to perform to the best of their abilities.

All data and information obtained from the administration of the study questionnaires and individual performance records is confidential in nature. Only the investigator and each subject, upon request with respect to his/her own performance data, were permitted access to data upon completion of the experimental trials.

### Experimental Design

Similar procedures were employed for all groups tested during the present study (Figure 2.1). The experiments were conducted in Room 8 of the Women's Building, Oregon State University, Corvallis, Oregon, and each subject came to the experimental room according to an agreed upon time. Each subject was involved in six sessions during each of three experimental days. Each subject was allowed one day of rest between each day of experiment testing. Each performance day consisted of two sessions, with a five-minute interval between the first

and second sessions. Determination of the length of the rest periods is provided appropriate discussion in a subsequent section of this chapter.

The subjects started the first session of each experimental day by completing the pre-session information and the 1RM-EM forms. The subjects then engaged in their usual upper body stretching for two to three minutes. Following the stretching period, the subjects warmed up, as recommended by Westcott (1983), using light weights and then lifting up to the target weight (i.e., 10 repetitions at 50 percent, 8 repetitions at 60 percent, 3 repetitions at 75 percent, 1 repetition at 90 percent, and then the target weight). This procedure was maintained consistently throughout the study and was also intended to minimize the possibility of muscle injury. When the 1RM lift was successful, five lbs of weight were added and another attempt was made. Subjects were allowed to try as many lifts as they desired at the new weight. This procedure ensured that each subject lifted the maximum weight achievable. The first session was then completed and subjects were provided with feedback about their 1RM bench press performance.

The subjects had five minutes of rest before starting the next session. Each subject was again asked to complete the 1RM-EM form, and then the 1RM bench press was performed. There were no stretching and warm-up exercises prior to the start of the second session. The weight values for the second trial were in accordance with the weight values that the subjects had indicated as their 100 percent level of confidence for the 1RM-EM. When the target performance was successfully completed, a second lift was attempted, subject to the addition of five lbs of weight. However, if the trial was not successfully completed, then five lbs of weight were withdrawn and another attempt was required. This procedure was employed until each subject had successfully completed a second 1RM performance.

The first day of the experiment was introductory, allowing the investigator to gain knowledge of the 1RM bench press performance capabilities of each subject. The investigator also had the opportunity to obtain reasonable weight values for the purposes of deception manipulation. In addition, this introductory session was included to provide subjects accustomed to the free-style bench press with the opportunity to become familiar with the universal machine bench press.

The first two high and two low self-esteem groups received the same treatments. These treatments were false positive, false negative, and actual feedback. During the experimental introductory sessions, subjects received actual feedback during both sessions. During the second day, the first high self-esteem group then received false positive feedback upon completion of the first session, and actual feedback upon completion of the second session. The second high self-esteem group was given false negative feedback upon completion of the first session, and actual feedback upon completion of the second session. The third high self-esteem group received actual feedback from the experimenter during both sessions. On the third experimental day, reverse feedback was administered. The first high self-esteem group was given false negative feedback following the first session, followed by actual feedback during the following session. The second high self-esteem group received false positive feedback at this time and actual feedback at the end of session. Actual feedback was given to group three after completion of each session during both experimental days.

The low self-esteem groups were administered treatments which paralleled those offered the high self-esteem groups. The 1RM-EM was administered prior to each session for every group. The subjects were paid \$10.00 each upon completion of the experiment, and were told that the debriefing (Appendix H) and the results of the study would be mailed to them after completion of the present study. The study design is summarized in Figure 3.1.



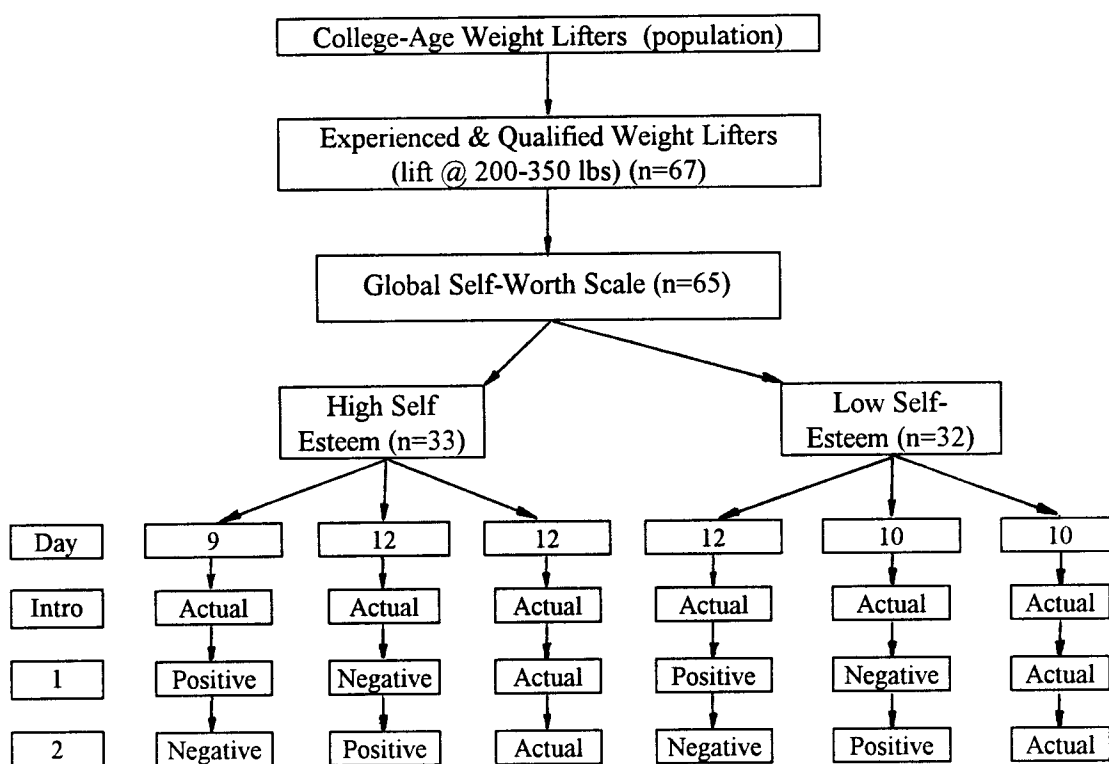


Figure 3.1. Experimental Treatment Design.

### Believable Weight Values

To provide reasonable manipulation weight values, subject percentages for the 1RM bench press performance weights during session two of day 1 were calculated. Fitzsimmons et al.(1991) recommended that weight values within four percent constituted a normal range of variability for experienced weight lifters. Therefore, for the purpose of performance deception in the present study, four percent of the subjects' performance weights (day 1, session 2) was used as the manipulative variation. The range of manipulation weight values was thus from 7.5 lbs to 12.5 lbs. Three additional subject levels were created, based upon the following manipulative weight values: 7.5, 10, and 12.5 lbs, respectively, for

subjects who lifted (day 1, session 2) between 200 to 245 lbs, 250 to 295 lbs; and 300 to 350 lbs.

### Rest Periods

Since energy lost during lifting trials would affect subsequent performance, rest periods between each lift were determined based upon the following considerations. In theory, human energy can be restored to 98.44–99.61 percent of initial value within three to four minutes following performance of from one to four sets of maximum lift (Fleck & Kraemer, 1987). Westcott (1983) suggested that the duration of the recovery period between 1RM sets should be from three to four minutes. Fitzsimmons et al. (1991) allotted two minutes between each warm-up lift and 3.5 minutes between each 1RM lift. Berger (1961) employed from two to three minutes of rest between attempts. For the purposes of the current investigation, three-minute rest periods were applied during the warm up period and five-minute rest periods were allowed between each 1RM maximum performed during the course of this study.

### Data Treatment

Statistical analyses performed for this study were processed using the Clear Lake Research (Clear Lake Research Inc., Houston, TX) analysis of variance (ANOVA) and the *Statview Student*, version 1.0, program. Data for analysis consisted of either weight values or weight value changes between sessions obtained from subject performances of the 1RM bench press, and from responses to the self-efficacy questionnaires. An alpha level of .05 was used for the accept-

ance or the rejection of the hypotheses. Statistical analyses were calculated as follows:

- 1) Data reliability were established from consideration of F-test values as determined by a repeated measures ANOVA and the intraclass performance correlation coefficients between performance and self-efficacy during sessions one and two of the introductory day trials.
- 2) A  $2 \times 3 \times 2$  (self-esteem  $\times$  feedback  $\times$  day) ANOVA with repeated measures was applied to the third factor (day) data to examine relationships between high and low self-esteem subjects, types of feedback, and the day of measurement. The data used for this analysis were the mean differences for 1RM performance and self-efficacy prior to and following the administration of positive, negative, and actual feedback.
- 3) A  $2 \times 3 \times 3 \times 2$  (self-esteem  $\times$  feedback  $\times$  confidence level  $\times$  day) ANOVA with repeated measures was applied to the self-efficacy level and day factors to examine relationships between high and low self-esteem subjects, types of feedback, self-efficacy level, and day of measurement. The data used for this analysis were the mean differences for self-efficacy prior to and following the administration of positive, negative, and actual feedback.
- 4) Correlation coefficients were calculated to determine the relationship between self-efficacy and subsequent performance.
- 5) Regression analysis was performed to examine whether self-efficacy or previous performance were the most reliable predictors of subsequent performance. Mean data for self-efficacy at 100 percent levels of confidence and previous performance were applied to establish correlations with subsequent performance.

## CHAPTER 4

### RESULTS AND DISCUSSION

To examine the effects of false positive and false negative feedback on self-efficacy and 1RM bench press performances for high and low self-esteem experienced weightlifters, the results are presented in three sections. In the first section, analysis of the reliability of the data obtained for the study is considered. In the second, the influence of false positive and false negative feedback on self-efficacy and 1RM performance is examined. The final section describes the correlational analyses of relationships between self-efficacy and performance. The chapter is concluded with two final sections presenting a discussion of predictors of future performance and a final discussion of the overall results.

#### Estimations of Data Reliability

The estimation of data reliability for the current study was examined using a combination of a  $2 \times 2$  (self-esteem  $\times$  session) mixed design ANOVA, for which one session constituted the within-subject factor, and intraclass correlation coefficients were determined between sessions 1 and 2. Calculations are presented separately for performance and self-efficacy, based upon 1RM performances at 100%, 75%, and 50% levels of self-efficacy confidence between sessions 1 and 2.

### Performance Data Reliability

The self-esteem  $\times$  session revealed that the main effect for self-esteem was not significant,  $F(1,63) = .444$ ,  $p > .05$ . There were no significant differences for the 1RM bench press performances between high and low self-esteem weightlifters. At  $F(1,63) = 1.960$ ,  $p > .05$ , there was no interaction for self-esteem  $\times$  session, but the session main effect was significant at  $F(1,63) = 21.805$ ,  $p < .001$ . At means of 263.17 and 260.47 lbs., respectively, the subjects lifted greater weights in session 1 than in session 2, resulting in a difference of 2.7 lbs. The intraclass correlation (R) coefficients between performances for session 1 and 2 were identical at .99, an indication of high reliability. In addition, the small difference between the means was similar to results obtained by Fitzsimmons (1989). These results are presented in Table 4.1.

Table 4.1. Means, Standard Deviations, and Correlation Coefficients for 1RM Performance and Self-Efficacy Measures.				
Variable	Session 1 Mean (SD)	Session 2 Mean (SD)	R	F
Performance	263.17 (39.04)	260.47 (38.69)	.99	21.81**
100%	241.30 (35.27)	258.36 (38.39)	.95	223.57**
75%	252.23 (35.38)	265.67 (38.47)	.95	359.59**
50%	261.47 (36.09)	271.89 (38.92)	.94	49.75**
** = $P < .001$ .				

### Self-Efficacy Data Reliability

For self-efficacy at 100%, 75% and 50% levels, performance of a  $2 \times 3 \times 2$  (self-esteem  $\times$  self-efficacy confidence level  $\times$  session) ANOVA, and determination of the intraclass correlation coefficients (Table 4.1), indicated that the results of the analysis were reliable. There was no main effect for self-esteem

with respect to the prediction of 1RM bench press performance. The main effect for session was significant, at  $F(1,63) = 347.438$ ,  $p < .001$ . The subjects predicted their performances for session 1 ( $M = 251.67$  lbs.) and session 2 ( $M = 265.31$  lbs.) differently, reflecting greater variance in predictive capabilities than demonstrated by actual performances.

The self-efficacy confidence level main effect was significant, at  $F(2,126) = 37.147$ ,  $p < .001$ . The subjects predicted their performances differently for each separate level of self-efficacy (100%, 75%, and 50%). The mean predictions were 249.83, 258.95, and 266.67 lbs., respectively. The session  $\times$  confidence level interaction was significant, at  $F(2,126) = 31.747$ ,  $p < .001$ . Again, the subjects predicted their performance differently between sessions 1 and 2 for the separate levels of self-efficacy (100%, 75%, and 50%), respectively, 241.30, 252.23, and 261.47 lbs. for session 1 and 258.36, 265.67, and 271.89 lbs. for session 2. The intraclass correlation coefficients between sessions were analyzed for all self-efficacy confidence levels. The correlations were lower than the performance correlations, ranging from .94 to .95. Means, standard deviations, and the intraclass correlation coefficients for performance and self-efficacy at 100%, 75%, and 50% levels are given in Table 4.1.

#### False Positive and Negative Feedback Influences Upon 1RM Performance and Self-Efficacy

In this section, the influence of false positive or false negative feedback upon performance and self-efficacy among the high and low self-esteem groups is examined. For the day factor, a  $2 \times 3 \times 2$  (self-esteem  $\times$  feedback  $\times$  day) ANOVA with repeated measures was conducted to determine main effects for self-esteem, feedback, and the day of the trial, as well as interactions between

these variables. The between-subjects factors were high and low self-esteem, and positive, negative, or actual feedback; the within-subjects factor was either day 1 or day 2.

Performances and self-efficacy change scores between sessions 3 and 4 (day 1) and sessions 5 and 6 (day 2) provided the data for calculation. Change scores were used in order to get rid of the influence of the preexisting degree of change in self-efficacy and performance between the groups. Each subject in the experimental groups received manipulative feedback during these sessions. The basis for the use of change scores was the observed reduction or increase in 1RM bench press performances during the second session of the experimental days (days 1 and 2). In other words, during those trials the subjects lifted lighter or heavier weights following the completion of their first 1RM bench press performance.

### One Repetition-Maximum Performance

First, order effects were examined for the effect upon performance of the order of presentation of false positive or false negative feedback. A  $2 \times 2$  (feedback  $\times$  day) ANOVA yielded no main effect for order (day), at  $F(1,41) = .107$ ,  $p > .05$ , and no main effect for type of feedback, at  $F(1,41) = 1.115$ ,  $p > .05$ . As foreseen, whether the subjects received false positive or false negative feedback first (or last) had no measurable effect upon performance. Based upon these results, the data were subjected to further analysis by specific variables.

### Self-Esteem

The first hypothesis was concerned with significant performance differences between high and low self-esteem experienced weightlifters for the 1RM

bench press. A  $2 \times 3 \times 2$  (self-esteem  $\times$  feedback  $\times$  day) ANOVA with repeated measures conducted for the day factor revealed significant main effect differences for levels of self-esteem, at  $F(1,59) = 6.076$ ,  $p < .02$ . The high self-esteem groups ( $M = -2.45$  lbs.) performed significantly different than the low self-esteem groups ( $M = -4.65$  lbs.), indicating a larger decline by the low-esteem weightlifters for their subsequent performance. At the same time, there were no main effects for either feedback or day ( $F(2,59) = 1.310$ ,  $p > .05$  and  $F(1,59) = .154$ ,  $p > .05$ , respectively).

As previously observed, due to the number of 1RM performance trials employed for this study, fatigue could have influenced the subjects' subsequent performances. However, the high self-esteem subjects performed significantly better than low self-esteem subjects though both groups were subject to identical treatments and procedures. Thus, based upon consistency theory, high self-esteem subjects maintain performance levels better than low self-esteem subjects (Shrauger & Rosenberg, 1970; Shrauger & Sorman, 1977).

#### Self-Esteem by Feedback

While receiving false positive, false negative, and actual feedback, there were no significant differences for the self-esteem  $\times$  feedback interaction ( $p > .05$ ). Therefore, high and low self-esteem individuals were not affected differently by feedback manipulation.

#### Self-Esteem by Day

During sessions 3 to 4 (day 1) and sessions 5 to 6 (day 2), there were no significantly different interactions for self-esteem  $\times$  day ( $p > .05$ ) for high and low self-esteem subjects. This remained true when the performance change scores were combined across manipulative feedback.



### Self-Esteem by Feedback by Day

For high and low self-esteem subjects, following administration of feedback, there were no significant interactions from consideration of all factors (self-esteem  $\times$  feedback  $\times$  day,  $F(2,59) = 1.047$ ,  $p > .05$ ), nor were there significant differences for self-esteem  $\times$  feedback ( $p > .05$ ). Though there was a significant difference for the self-esteem main effect and for the feedback  $\times$  day interaction, overall findings did not support the effect of manipulative feedback upon the performances of experienced weight lifters based upon levels of self-esteem.

### Feedback

The second hypothesis was that there would be significant performance differences among subjects who received either false positive, false negative, or actual feedback. The feedback  $\times$  day interaction supported this hypotheses, at  $F(2, 59) = 6.734$ ,  $p < .01$ . The means and standard deviations for this interaction are provided in Table 4.2.

Table 4.2. Means and Standard Deviations for 1RM Performance Changes Following Administration of Manipulative Feedback.			
Session	Positive Mean (SD)	Negative Mean (SD)	Actual Mean (SD)
3-4	-0.3819 (0.00)	-4.7569 (6.19)	-3.8750 (4.06)
5-6	-2.6875 (5.03)	-5.8958 (4.36)	-3.7083 (3.68)
Average	-1.5347 (2.51)	-5.3264 (5.27)	-3.7917 (3.87)

A simple effects analysis was conducted to determine the locus of interaction, which occurred as shown in Figure 4.1. First, analyses of the simple effects between feedback and day indicated that the effects of feedback were significant for sessions 3 to 4 (day 1,  $F(2,118) = 10.711$ ,  $p < .01$ ), but were not significant for sessions 5 to 6 (day 2,  $p > .05$ ). Thus, the subjects who received

false positive, false negative, or actual feedback performed the 1 RM bench press differently only for sessions 3 to 4 (day 1). It should be noted that though there were no significant differences for sessions 5 to 6 (day 2), the effects of the feedback (either false positive or false negative) as administered during the previous sessions may still have influenced subject performances. Thus the lack of effect may have been due to the within subject's design.

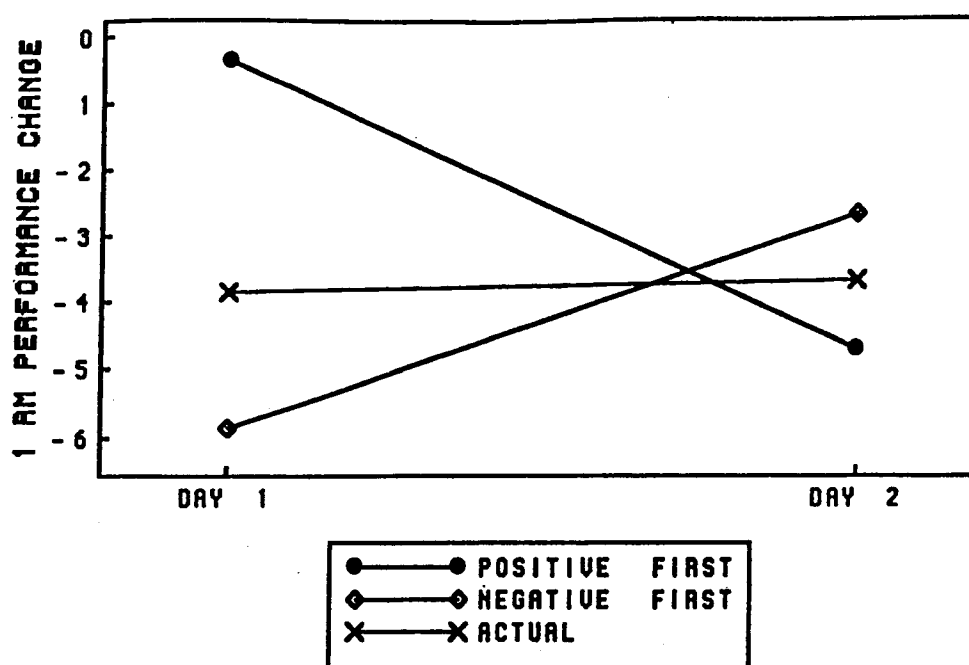


Figure 4.1. Means of 1RM Performance Changes for Groups Receiving Positive, Negative or Actual Feedback as Initial Treatment, Days 1 and 2.

Second, analyses of the simple effects for day within the level of feedback (false positive, false negative, or actual) indicated that performance changes between sessions 3 to 4 (day 1) were significantly different between subjects with false positive feedback first ( $F(1,59) = 8.513, p < .01$ ) and false negative feedback first ( $F(1,59) = 4.856, p < .05$ ). There were no significant differences for subjects

administered actual feedback ( $F(1,59) = .013, p > .05$ ). Experimental treatment for days 1 and 2 differed in that the groups which received false positive feedback and false negative feedback first on day 1 were reversed for day 2 treatment; this difference did not exist for those who received actual feedback.

A series of t-tests were employed to determine the influence of feedback upon 1RM performance between sessions 3 to 4 (day 1) after these scores were collapsed across the two groups. The effects of false positive and false negative feedback were significantly different, at  $t(20) = 2.467, p < .02$ , with a performance difference in excess of 5 lbs. In addition, false positive and actual feedback approached significance, at  $t(20) = 1.703, p = .052$ . Subjects administered false positive feedback performed somewhat better ( $M = 2.9$  lbs.) than did subjects administered actual feedback. However, the degree of change was not significant. There were no significant differences between false negative and actual feedback ( $t(21) = 1.233, p > .05$ ). This result replicated findings by Fitzsimmons et al. (1991), who had indicated that the performance of subjects with false negative feedback was either identical or inferior ( $M = 2.15$  lbs.) to performance of subjects administered actual feedback.

Therefore, false positive feedback affected the performance of subjects only between sessions 3 to 4 (day 1), and there were no significant effects for false negative and actual feedback for either sessions 3 to 4 or 5 to 6 (days 1 and 2). This initial finding is partially supportive of previous findings which indicated that individuals with false positive feedback increased performance levels, whereas individuals with false negative feedback decreased performance levels (Fitzsimmons et al., 1989; Fitzsimmons, 1991). However, even though the self-esteem  $\times$  feedback  $\times$  day interaction was not significant, the hypotheses of this study were based on looking at these separately between levels of self-esteem. High and low self-esteem subjects may perform differently, according to

receipt of either false positive or false negative feedback. Thus, follow-up analyses were conducted to determine if the high self-esteem subjects were positively affected by either false positive or false negative feedback, or if the low self-esteem subjects were negatively affected by either false positive or false negative feedback.

#### Feedback by Day for High Self-Esteem Subjects

A  $3 \times 2$  (feedback  $\times$  day) ANOVA with repeated measures for the day factor was calculated for the high self-esteem groups, demonstrating significant differences, at  $F(2,30) = 8.021$   $p < .005$ . The order in which subjects were administered false positive or false negative feedback was related to performance differences between sessions 3 to 4 (day 1) and 5 to 6 (day 2), whereas the subjects who received actual feedback did not demonstrate related performance differences ( $p > .05$ ). Simple effects analysis revealed that the false positive feedback first group ( $F(1,30) = 10.735$ ,  $p < .01$ ) performed their tasks differently from the false negative feedback first group ( $F(1,30) = 4.940$   $p < .05$ ) during both sessions. However, significant differences occurred only with respect to sessions 3 to 4 (day 1), at  $F(2,59) = 8.662$   $p < .001$ . The parameters for this interaction are shown in Figure 4.2.

During sessions 3 to 4 (day 1), experienced weight lifters with high self-esteem performed better after receiving false positive feedback ( $M = +2.778$  lbs.). In contrast, high self-esteem subjects, who were administered false negative feedback, experienced performance decreases ( $M = -4.792$  lbs.). Thus, high self-esteem subjects who received false positive feedback lifted approximately 7.5 lbs. more than high self-esteem subjects who received false negative feedback. At the same time, subjects provided with actual feedback experienced a performance decrease ( $M = -3.75$  lbs.) during the subsequent trial. Again, there were no

significant differences between sessions 5 to 6 (day 2), an effect which may possibly be attributed to the influence of the initial information provided during the previous day. These results were similar to those from the previous analysis, for which high and low self-esteem were not analyzed separately. The means and standard deviations for the analysis are given in Table 4.3.

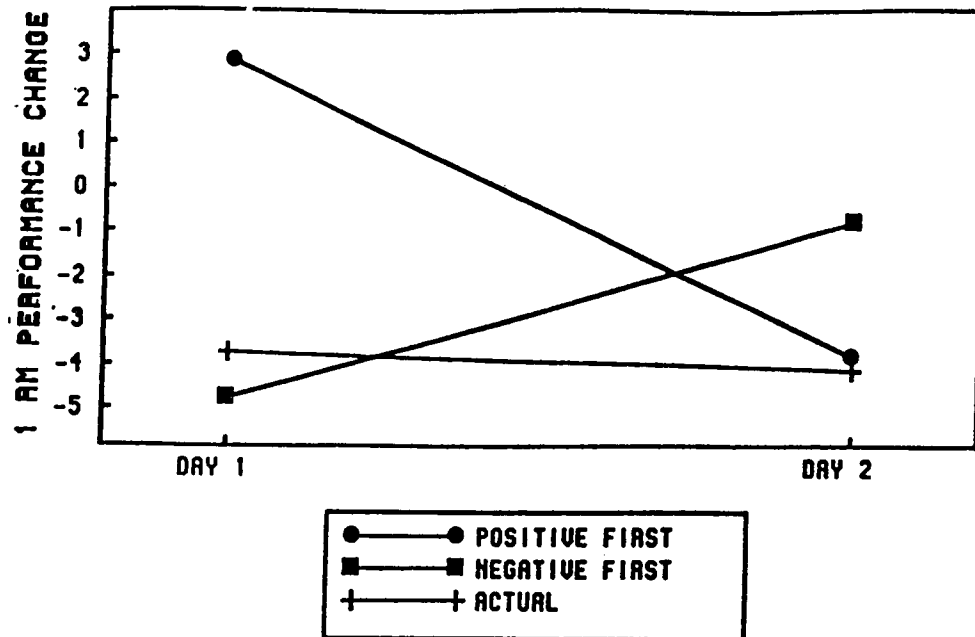


Figure 4.2. Performance Changes Among High Self-Esteem Subjects for Administration of Positive, Negative, or Actual Feedback.

Table 4.3. Means and Standard Deviations for Performance Changes of High and Low Self-Esteem Subjects After Receiving Feedback.			
Session	Positive Mean (SD)	Negative Mean (SD)	Actual Mean (SD)
<u>High SE</u>			
3-4	2.778 (2.32)	-4.792 (6.26)	-3.750 (4.83)
5-6	-0.875 (4.11)	-3.889 (3.77)	-4.167 (4.56)
<u>Low SE</u>			
3-4	-3.542 (7.42)	-7.000 (6.21)	-4.000 (3.16)
5-6	-4.500 (5.50)	-5.625 (4.78)	-3.250 (2.37)

### Feedback by Day for Low Self-Esteem Subjects

The results of data analysis support the hypothesis which predicted that low self-esteem subjects would not be affected by false positive feedback. A  $3 \times 2$  (feedback  $\times$  day) ANOVA with repeated measures for the day factor was also conducted for low self-esteem groups, indicating no significant interactions among low self-esteem groups ( $F(2,29) = 1.020, p > .05$ ). The means and standard deviations for performance changes following administration of manipulative feedback to the low self-esteem subjects are given in Table 4.3. Exposed to either false positive or false negative feedback, low self-esteem subjects demonstrated performance change effects which approximated those of subjects administered actual feedback. The interaction effects are illustrated in Figure 4.3.

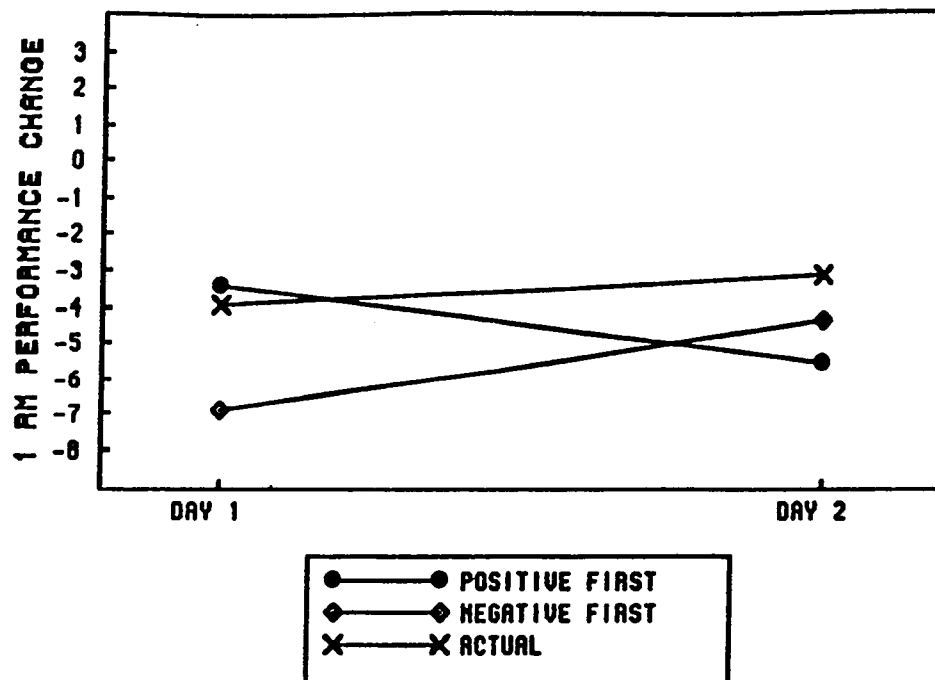


Figure 4.3. Performance Changes Among Low Self-Esteem Subjects for Administration of Positive, Negative, or Actual Feedback.

### One Repetition-Maximum Efficacy Measure

The subjects' self-efficacy was analyzed with a  $2 \times 3 \times 3 \times 2$  (self-esteem  $\times$  feedback  $\times$  confidence level  $\times$  day) repeated measures ANOVA for the confidence level and day factors. Scores for changes in self-efficacy levels (100, 75, and 50 %) between manipulative feedback sessions and subsequent sessions (3 to 4 and 5 to 6) were analyzed to determine the effects of manipulative feedback upon self-efficacy. There were no significant main effects for self-esteem, feedback, and day ( $p > .05$ ) with respect to changes in self-efficacy, nor were there any effects for positive, negative, and actual feedback. Moreover, there were no significant differences between days 1 and 2. Thus, predictions for 1RM bench press performance between levels of self-efficacy were not influenced by levels of self-esteem.

Significant differences were determined for the self-efficacy main effect ( $F(2,118) = 10.458, p < .001$ ), given significant differences for self-efficacy at 100, 75, and 50 percent levels. This finding was significant because it confirmed that subjects predicted their performance between levels of confidence differently and assured that the subjects in this study could make meaningful distinctions between these three levels of self-efficacy. In fact, subjects had predicted their performances would increase by means of 1.89, 2.57, and 3.48 lbs. for, respectively, 100, 75, and 50 percent self-efficacy levels. There were no significant main effects for the self-esteem and feedback main factors ( $p > .05$ ). In the initial trials, there were no differences between high and low self-esteem subjects for self-efficacy, and subsequently administered false positive, false negative, and actual feedback exercised no further influence. Self-efficacy interactions existed between self-esteem and day and between feedback and day, and these variables were subject to further analysis.

### Self-Esteem by Day Interaction

After false positive, false negative, and actual feedback variables were collapsed, a self-esteem  $\times$  day mixed design ANOVA, with day as the within-subject factor, was performed, indicating a significant interaction ( $F(1,59) = 6.380, p < .05$ , see Figure 4.4). The high and low self-esteem subjects evidenced differing changes in self-efficacy between sessions 3 to 4 (day 1) and 5 to 6 (day 2). High self-esteem subjects changed their self-efficacy by a mean of 1.64 lbs. between sessions 3 to 4 and by a mean of 4.48 lbs. between sessions 5 to 6, and low self-esteem subjects changed their self-efficacy by means of, respectively, 3.68 lbs. and 0.80 lbs. Though the self-esteem  $\times$  day interaction was significantly different, the simple effects revealed that the differences occurred only on day 2 ( $F(1,105) = 3.452, p = .06$ ), thus high and low self-esteem subjects provided differing predictions for self-efficacy only with respect to day 2 trials.

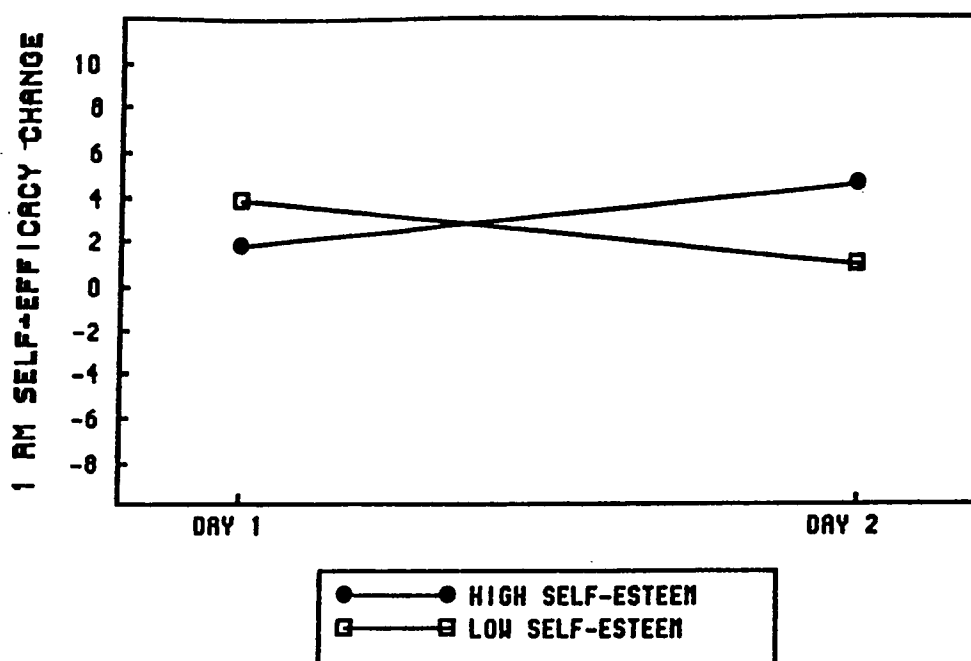


Figure 4.4. Means of Self-Efficacy Change for High and Low Self-Esteem Subjects Between Sessions 3 to 4 and 5 to 6.



However, since this interaction was collapsed for the feedback variables, these findings proved difficult to interpret. Means and standard deviations are provided in Table 4.4.

Table 4.4. Means and Standard Deviations for High and Low Self-Esteem Subjects Between Sessions 3 to 4 and Sessions 5 to 6.		
Self-Esteem	Day 1 Mean (SD)	Day 2 Mean (SD)
High	1.639 (9.527)	4.478 (9.961)
Low	3.684 (9.788)	0.802 (8.382)

Adding self-efficacy levels to the self-esteem  $\times$  day interactions, a three-way interaction revealed no further significant differences ( $F(2,118) = .508$ ,  $p > .05$ ). Between both sessions 3 to 4 (day 1) and 5 to 6 (day 2), the high and low self-esteem subjects did not predict their performance changes differently for any of the self-efficacy levels. The means and standard deviations for self-efficacy change between these respective sessions for the high and low self-esteem subjects are given in Table 4.5.

Table 4.5. Means and Standard Deviations in Self-Efficacy Changes for High and Low Self-Esteem Subjects, Days 1 and 2.		
Self-Efficacy Level	Session 3-4 (Day 1) Mean (SD)	Session 5-6 (Day 2) Mean (SD)
<u>High SE</u>		
100%	2.407 (8.49)	5.982 (11.13)
75%	1.402 (10.21)	5.134 (9.35)
50%	0.884 (10.03)	3.901 (8.70)
<u>Low SE</u>		
100%	4.847 (10.64)	1.266 (8.47)
75%	3.267 (9.63)	0.883 (8.62)
50%	2.939 (9.94)	0.261 (8.30)

### Feedback by Day Interaction

The interactions for self-efficacy between feedback and day were significant, at  $F(2,59) = 35.099$ ,  $p < .001$  (see Figure 4.5). The self-efficacy predictions of the subjects changed significantly following the administration of manipulative feedback during sessions 3 to 4 (day 1) and sessions 5 to 6 (day 2). The subjects who received false positive feedback increased their self-efficacy by a mean of 7.19 lbs. for session 3 to 4 and by a mean of 9.48 lbs. for sessions 5 to 6, whereas subjects receiving false negative feedback decreased their self-efficacy by means of, respectively, 1.94 and 4.63 lbs., and subjects receiving actual feedback increased their self-efficacy by means of, respectively, 2.74 and 3.07 lbs. Means and standard deviations are provided in Table 4.6.

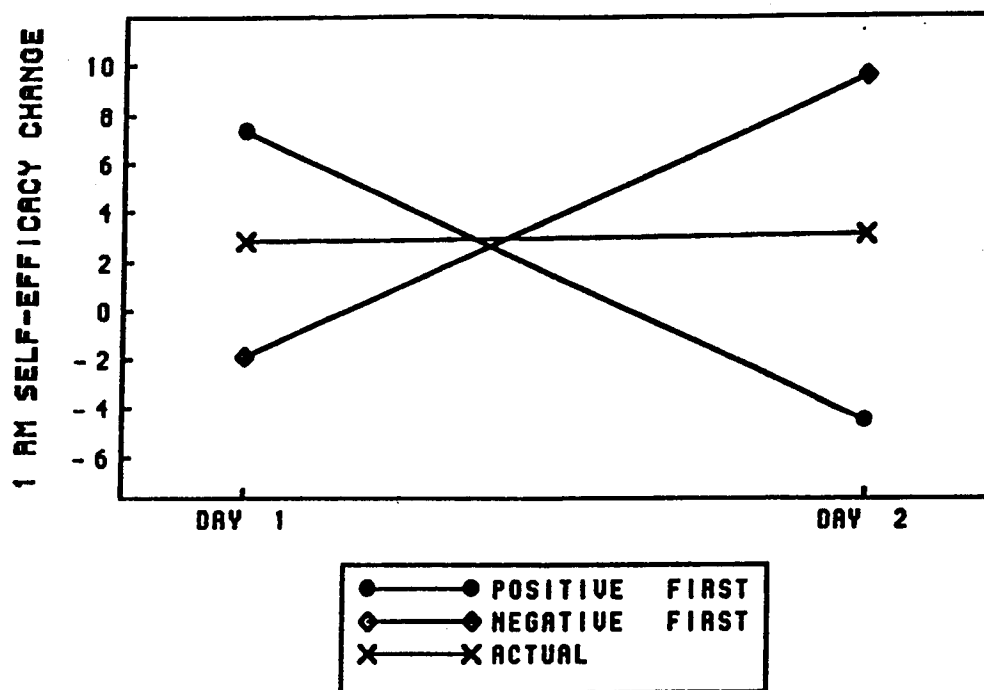


Figure 4.5. Means of Self-Efficacy Change for Positive, Negative, and Actual Feedback.

Simple effects analyses revealed significant differences between false positive feedback first ( $F(1,59) = 37.79, p < .001$ ), false negative feedback first ( $F(1,59) = 34.57, p < .001$ ), between sessions 3 to 4 ( $F(2,105) = 11.33, p < .01$ ), and between

Table 4.6. Means and Standard Deviations for Changes in Self-Efficacy Following Administration of Manipulative Feedback.			
Session	Positive Mean (SD)	Negative Mean (SD)	Actual Mean (SD)
3-4	7.188 (9.629)	-1.939 (10.323)	2.736 (7.001)
5-6	9.842 (7.795)	-4.630 (7.887)	3.068 (6.690)
Average	8.155 (8.712)	-3.284 (9.105)	2.902 (6.846)

sessions 5 to 6 ( $F(2,105) = 44.13, p < .001$ ). A significant difference was not found for subjects provided with actual feedback ( $F(1,59) = .03, p > .05$ ). Note that when self-efficacy level was analyzed with feedback  $\times$  day analysis, the interaction revealed no significant differences ( $F(4,118) = 1.893, p > .05$ ), which indicated that self-efficacy at all levels (100%, 75%, and 50%) was not significantly different following different types feedback. Means and standard deviations for changes in self-efficacy following manipulative feedback are provided in Table 4.7.

Table 4.7. Means and Standard Deviations for Changes in Self-Efficacy Levels Following Administration of Feedback.				
SE	Session	Positive Mean (SD)	Negative Mean (SD)	Actual Mean (SD)
100%	3-4	8.090 (10.70)	0.125 (8.05)	2.667 (6.75)
	5-6	10.125 (6.95)	-4.500 (10.39)	4.392 (8.68)
75%	3-4	7.083 (9.96)	-2.787 (7.60)	2.875 (7.57)
	5-6	5.596 (6.79)	-4.389 (6.33)	3.042 (6.65)
50%	3-4	6.389 (11.24)	-3.154 (7.52)	2.667 (6.70)
	5-6	8.725 (7.17)	-5.000 (8.63)	1.778 (5.30)

The self-esteem factor did not interact with feedback  $\times$  day. A three-way interaction (self-esteem  $\times$  feedback  $\times$  day), revealed no further significant differences ( $F(2,59) = .728, p > .05$ ). High and low self-esteem subjects did not differ with respect to changes in self-efficacy when receiving different feedback on either days 1 or 2.

### Correlation Between Performance and Repetition-Maximum Self-Efficacy Measures

In studies which have related self-efficacy to sport or physical activity, the general interest has been directed at the determination of self-efficacy/performance to previous performance/self-efficacy relationships. Comparisons between self-efficacy and previous performance, as predictors of subsequent performance, have also been tested. Standing in distinction to the Bandura theory of self-efficacy, previous performance has been shown to be the best predictor for subsequent performance. To examine these relationships, 1RM self-efficacy changes and subsequent performance changes were measured for each experimental day, directed as well at the determination of correlations between changes in previous performance and subsequent performances. In addition, changes in self-efficacy in relation to changes in previous performance changes were analyzed to determine which was the best predictor of the subsequent performance changes.

#### Self-Efficacy and Subsequent Performance

The data considered for this correlational analysis were self-efficacy changes between sessions 1 to 2 (introductory day), sessions 3 to 4 (day 1) and sessions 5 to 6 (day 2) in relation to performance changes for the same series of trial days. A significant correlation ( $p < .05$ ), based upon a range from .33 to .42,

was found between self-efficacy changes and subsequent performance changes only during sessions 3 to 4 (day 1). This finding was parallel to analyses of performance changes which indicated that there was a relation to feedback only for sessions 1 to 2 (day 1). The correlations were not significant between sessions 1 to 2 or 5 to 6, ranging from, respectively, -0.16 to -0.19 and .02 to 0.05. The correlation coefficients are given in Table 4.8.

Table 4.8. Correlations Between Self-Efficacy Change and Subsequent Performance Change.			
Level of Confidence	Session		
	1-2	3-4	5-6
100%	-0.16	.33**	.02
75%	-0.18	.42**	-0.05
50%	-0.17	.35**	.04
** = $p < .01$ .			

#### Correlations Between High and Low Self-Esteem.

Correlations were analyzed separately between high and low self-esteem subjects. Results similar to those discussed in the previous section were found; that is, there were significant correlations ( $p < .05$ ) between sessions 3 to 4 (day 1) for both the high and low self-esteem groups. With the exception of the 50 percent self-efficacy level for the low self-esteem group ( $r = .26$ ,  $p > .05$ ), all of the self-efficacy levels were significant. The high self-esteem group correlations ranged from .36 to .50, whereas the low self-esteem group correlations ranged from .26 to .39. Correlations for sessions 1 to 2 (introductory day) and 5 to 6 (day 2) were lower for both groups. The correlation coefficients are given in Table 4.9.

Table 4.9. Correlations Between Self-Efficacy and Performance for High and Low Self-Esteem Subjects.			
Level of Confidence	Session		
	1-2	3-4	5-6
High SE			
100%	-0.14	.36*	0.01
75%	-0.20	.50**	0.02
50%	-0.17	.50**	0.17
Low SE			
100%	-0.17	.37*	-0.05
75%	-0.19	.39*	-0.22
50%	-0.19	.26	-0.17
* = $p < .05$ ; ** = $p < .01$ .			

#### Correlations Between Previous Performance Change and Subsequent Self-Efficacy Change

The relationship between 1RM performance and subsequent self-efficacy measures was also examined for performance changes between sessions 2 to 3, 3 to 4, and 4 to 5 as the previous performance change correlated with self-efficacy changes between sessions 3-4, sessions 4-5, and sessions 5-6. Performance changes between these respective sessions were used as previous performance data since they indicated prior performance levels achieved by the subjects prior to performance of current trials (Figure 4.6). In fact, the first correlation was between previous performance changes between sessions 2 to 3 and subsequent self-efficacy changes between sessions 3 to 4. The second correlation was between previous performance changes between sessions 3 to 4 and subsequent self-efficacy changes between sessions 4 to 5. The last correlation was between previous performance changes between sessions 4 to 5 and subsequent self-efficacy between sessions 5 to 6. The data indicated significant positive

correlations between performances for sessions 4 to 5 and subsequent self-efficacy sessions 5 to 6 ( $r > .25$  to  $.31$ ,  $p < .05$ ). No degree of significance was determined by correlational analysis for the remaining variables ( $r < .18$ ,  $p > .05$ ). Correlation coefficients are given in Table 4.10.

Table 4.10. Correlations Between Previous Performance Changes and Subsequent Self-Efficacy Changes.			
Level of Confidence	Performance (day) by Self-Efficacy (day)		
	P3 SE4	P4 SE5	P5 SE6
100%	.13	-0.18	.25*
75%	.15	-0.14	.31**
50%	.17	-0.07	.32**
* = $p < .05$ ; ** = $p < .01$ .			

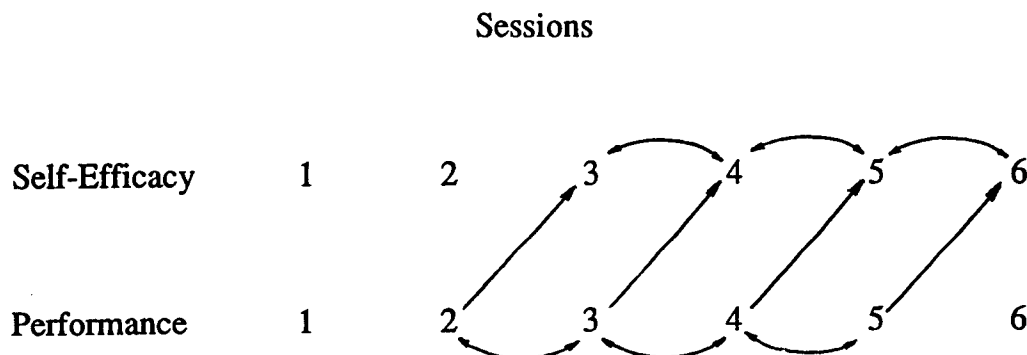


Figure 4.6. Correlations Among Previous Performance Change and Subsequent Self-Efficacy Change.

Correlations Between Previous Performance Changes and Subsequent Self-Efficacy Changes for High and Low Self-Esteem Subjects

For the purpose of determining differences between high and low self-esteem subjects, the data were analyzed separately. With the exception of the 75 and 50 percent levels of self-efficacy confidence ( $r_s < .23$ ,  $p > .05$ ), significant correlations were found for all of the variables for the high self-esteem groups ( $r = .28$  to  $.49$ ,  $p < .01$ ). In contrast, no significant correlation coefficients were found for the low self-esteem group ( $r < .19$  to  $.02$ ,  $p > .05$ ). Correlation coefficients between previous performances and changes in subsequent self-efficacy for the high and low self-esteem subjects are given in Table 4.11.

Table 4.11. Correlation Between Performance and Subsequent Self-Efficacy Changes for High and Low Self-Esteem Subjects.			
Level of Confidence	Performance (day) by Self-Efficacy (day)		
	P2-3/SE3-4	P3-4/SE4-5	P4-5/SE5-6
<u>High SE</u>			
100%	.28*	-0.25*	.42**
75%	.36**	-0.23	.46**
50%	.41**	-0.18	.32*
<u>Low SE</u>			
100%	.06	-0.14	.07
75%	-0.08	-0.09	.19
50%	-0.03	-0.02	.17
** = $p < .01$ ; * = $p < .05$ .			

Prediction of Future Performance

In sport studies focusing on self-efficacy theory (Fitzsimmons et al., 1991), the relative effectiveness of self-efficacy and performance for the pre-



diction of future performance has been a common interest. For the current study, multiple regression analyses were conducted to determine if self-efficacy or previous performance was the best predictor of subsequent 1RM performance. Self-efficacy changes between sessions 3 to 4 and 5 to 6, and previous performance changes between sessions 2 to 3 and 4 to 5 were used as the predictor variables. The criterion variables were the performance changes between sessions 3 to 4 and 5 to 6.

The backward selection multiple regression (Thomas & Nelson, 1985) was used in prediction of future performance analysis. The analysis procedure was that the independent variables (self-efficacy changes between sessions 3 to 4 and 5 to 6 and previous performance changes between sessions 2 to 3 and 4 to 5) were eliminated in according to their unimportance. The analysis was begun with all of the independent variables, then dropped out those variables which did not significantly important contribute to the prediction of the criterion variable (subsequent performance).

In general, from the analyses considered in the following two sections, self-efficacy was a better predictor during sessions conducted on both experimental days considered. This finding supports Bandura's self-efficacy theory which indicated that self-efficacy was the best predictor of subsequent performance.

### Day One

Multiple regression analysis, consisting of 100, 75, and 50 percent changes in self-efficacy, previous performance changes as predicted variables, and subsequent performance changes as criterion variables, revealed significant differences at  $F(4,60) = 4.579$ ,  $p = .0027$ . However, further investigation of each predicted

variable showed that the coefficient terms were significant only for 75 and 50 percent, but not for 100 percent self-efficacy change or previous performance change ( $p > .05$ ). Thus, a reduced model based upon the elimination of the 100 percent self-efficacy or previous performance changes, those which did not contribute to the criterion variable, was employed. Regression analysis then revealed significant differences for both 75 and 50 percent self-efficacy change ( $p < .05$ ). The relationship between the two levels of self-efficacy and subsequent performance changes may be represented as follows:

$$\hat{y} = -4.247 - .552x_1 + .904x_2 ,$$

where

$\hat{y}$  = represents an estimate of subsequent performance between sessions 3 to 4,

$x_1$  = represents 50 percent self-efficacy change between sessions 3 to 4,  
and

$x_2$  = represents 75 percent self-efficacy change between sessions 3 to 4.

### Day Two

The procedure described for day 1 in the previous section was followed for day 2. Multiple regression revealed significant differences at  $F(4,60) = 2.831$ ,  $p = .0322$ . Further analysis of each of the predicted variables indicated that all three self-efficacy change levels were significant, but that the levels for previous performance were not ( $p > .05$ ). Thus, a reduced model based upon the elimination of previous performance change, which did not contribute significantly to the criterion variable, was employed. Regression analysis then revealed significant differences for all levels of self-efficacy change ( $p < .05$ ). The relationship

between these levels of self-efficacy change and subsequent performance change may be represented as follows:

$$\hat{y} = 3.483 - .49x_1 + .937x_2 - .457x_3 ,$$

where

$\hat{y}$  = represents an estimate of subsequent performance between sessions 5 to 6,

$x_1$  = represents 50 percent self-efficacy change between sessions 5 to 6,

$x_2$  = represents 75 percent self-efficacy change between sessions 5 to 6,  
and

$x_3$  = represents 100 percent self-efficacy change between sessions 5 to 6.

### Discussion

The primary goal of the present study was to determine the effects of false positive and false negative feedback upon self-efficacy and the subsequent weightlifting performance of subjects classified as either high or low in self-esteem. In a combined analysis, self-esteem influenced neither self-efficacy nor performance changes due to the administration of manipulative feedback. However, when high and low self-esteem subjects were examined separately, the data suggest some differences in response to the feedback. The following discussions of performance and self-efficacy are presented separately, followed by a discussion of correlations between performance self-efficacy and subsequent performances.

## Performance

The first hypothesis, that high and low self-esteem subjects would differ significantly in performance, was supported. In other words, the high self-esteem subjects lifted heavier weights than those lifted by low self-esteem subjects. These findings are in agreement with those of Baumeister and Tice (1985), in which high self-esteem individuals emphasized their abilities, strengths and good qualities, whereas low self-esteem individuals emphasized their deficiencies, weaknesses, and bad qualities. These findings also indicate that the median-split method used to classify high and low self-esteem subjects for this study was appropriate (Resnik & Lammers, 1985; Sandelands, Brockner & Glynn, 1988).

The second hypothesis, that false positive, false negative, or actual feedback would have an effect upon self-efficacy and performance, was supported. The subjects who received manipulative feedback performed differently. These results confirmed those previously established by Fitzsimmons et al. (1991), Nelson and Furst (1972), and Weinberg et al. (1979, 1980) indicating that manipulative feedback had influenced performance. With false positive feedback, subjects may perform their tasks better than individuals who are administered either false negative or actual feedback.

However, this effect was found only for the first day of the manipulative treatment (sessions 3 to 4). The rational explanation for this effect is that during later sessions the subjects were still influenced by the first manipulative feedback administered. Therefore, the first manipulation feedback may serve to reduce the effects of subsequent feedback, and feedback administered in different sessions may be self-cancelling when the order of feedback is reversed by group. Though treatments were changed to false negative feedback on the second day, subjects who had experienced false positive feedback during the first day may have

continued to believe the latter and were better able to perform their tasks. After receiving false positive feedback on the second day of manipulative feedback, the subjects who had first received false negative feedback also did not do as well. The influence of false negative feedback during the first treatment day may have continued to influence performance.

The results from the self-efficacy analyses confirm that the first manipulative feedback treatments influenced performance between sessions 5 to 6 (day 2). Subjects predicted their performances with significant differences between both sessions 3 to 4 (day 1) and 5 to 6 (day 2). When subjects predicted their performances after receiving manipulative feedback, but in the absence of actual performances, it was predicted that they would perform significantly better after receiving false positive feedback and significantly worse after receiving false negative feedback (see Figure 4.5). Performance and self-efficacy for subjects who received actual feedback were stable as expected.

The third hypothesis, that high self-esteem subjects would be affected by false positive feedback, and would thus perform better following false positive feedback than following the administration of actual or false negative feedback, was confirmed. High self-esteem subjects lifted heavier weights following false positive feedback. However, the fourth hypothesis, that false negative feedback will increase performance by high self-esteem subjects, was not supported. As had been foreseen in the research design, high self-esteem subjects did not perform as well following false negative feedback, and evidently did not try as hard to preserve their prior self-image. This result was in contrast to those of previous studies by McFarlin, Baumeister and Blascovich (1984) and Shrauger and Sorman (1977), which indicated that high self-esteem subjects increased their efforts following failure. However, Baumeister and Tice (1985) suggested that high self-esteem subjects may perform differently since failures did not always

occur for the same reasons. In fact, high self-esteem subjects responded differently to failure, dependent upon the attributional and self-presentational implications of that failure. They performed better after humiliating failure (i.e., failure that subjects accepted as their own fault or a reflection of their lack of ability), but worse after failure attributed to external factors not subject to their personal control.

The subjects considered for the present study were not asked to provide reasons for their success or failure, but when they performed worse than expected, most of the subjects blamed the failure on external factors (e.g., they had not had sufficient sleep prior to the performance day). Therefore, it may be expected that when they were able to excuse failure in this manner, they contributed less effort to the next trial.

The fifth hypothesis, that low self-esteem subjects would not improve performance following administration of false positive feedback, was supported. Baumeister and Tice (1985) found similar results. In their study, initial successes did not push low self-esteem subjects to pursue the task and thus produce improved subsequent performance. It was explained that low self-esteem subjects avoided performance on tasks that were expected to lower their esteem. Therefore, their task preferences were lower following success since they believed they would be discredited if they did poorly on a subsequent task. Low self-esteem subjects often believed that unexpected positive feedback had occurred by chance, and was not truly reflective of their abilities. Therefore, they did not try hard to maintain that performance level.

The final hypothesis, that, after false negative feedback, low self-esteem subjects would perform the poorest of all groups (i.e., high self-esteem with false positive feedback, high self-esteem with false negative feedback, and low self-esteem with false positive feedback), was not supported statistically. Low self-

esteem subjects administered either false positive or actual feedback did not achieve performances that were statistically different from those of low self-esteem subjects administered only false negative feedback; the mean values for the performances of the former were the lowest among all groups. However, mean differences of low self-esteem subjects with false negative feedback performed the most poorly.

### Self-Efficacy

Manipulative feedback influenced not only performance by experienced weight lifters, it also had an effect upon their self-efficacy. The analysis of the self-efficacy results was similar to those for the repeated measures analysis of performance. First, the  $2 \times 3 \times 3 \times 2$  (self-esteem  $\times$  feedback  $\times$  self-efficacy  $\times$  day) ANOVA with repeated measures for self-efficacy (at 100, 75, and 50% levels) and day (sessions 3 to 4 and 5 to 6) revealed that self-esteem had no influence upon self-efficacy change between sessions following manipulative feedback. However, both the high and low self-esteem subjects predicted different performance among the three self-efficacy levels: increases of 1.89, 2.57, and 3.48 lbs. for, respectively, 100, 75, and 50 percent levels. When subjects predicted their performance changes, predictions at the 100 percent level were increasingly accurate and close to true performance values.

These findings indicate that after receiving manipulative feedback, false negative or false positive, subjects responded differently to the feedback in accordance with their prior self-perceptions. For self-efficacy, as with performance, there was an interaction between feedback and day. Given false positive feedback, subjects predicted that they would lift heavier weights during the next session. In contrast, false negative feedback caused subjects to believe

that they would lift lighter weights during the next session. Subjects receiving actual feedback believed that they would improve performance with respect to their previous session. Thus, the trend established for manipulative feedback demonstrated a greater effect upon self-efficacy than upon performance among experienced weight lifters.

### Correlations Between Performance, Self-Efficacy, and Subsequent Performance

Changes in self-efficacy and performance showed significant correlations only between sessions 3 to 4 (day 1). These findings were similar between high and low self-esteem subjects when the correlations were analyzed separately. They supported Bandura's self-efficacy theory, indicating that self-efficacy is a more crucial factor to subsequent performance in novel situations (Fitzsimmons, 1989). In the present study, when subjects were first faced with manipulative feedback (either false positive or false negative) which was or was not congruent with their expectations, self-efficacy demonstrated a higher correlation compared to the second day of manipulative feedback when the subjects had become familiar with the feedback. However, there were no significant differences for the effect of self-esteem.

One level of self-efficacy change (100%) was not found to be a good predictor of subsequent performance change on day 1, but the correlation between these variables was significant. This indicated that the 100% level of self-efficacy did not contribute to the prediction in a unique manner. The remaining levels (75 and 50%) proved to be good predictors on both days 1 and 2. In contrast, previous performance change did not prove to be a good predictor of subsequent performance change for either experimental day. To the extent that



self-efficacy is a good predictor of subsequent performance, these findings supported Bandura self-efficacy theory.

Campbell and Fairley (1985) concluded that though the majority of self-esteem and feedback studies found high correlations between these two variables, their findings could be interpreted to indicate a stronger relationship for failure (negative) than for success (positive) conditions. Thus, in contrast to Bandura self-efficacy theory, the relationship of false positive feedback to high self-esteem was less than the relationship of false negative feedback to high self-esteem. However, if the design of the studies reviewed encompassed subject familiarity with the treatment routines, then the influence of self-efficacy may have been less important (Fitzsimmons, 1989).

The present study was designed to clarify whether high and low levels of self-esteem exercised influence upon self-efficacy and performance among experienced weight lifters following the administration of either false positive or false negative feedback. In general, no evidence was presented for the influence of high self-esteem upon either self-efficacy or performance. However, false positive and false negative feedback influenced both self-efficacy and performance change.

## CHAPTER 5

### SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

The primary purpose of the present study was to determine the effects of false positive and false negative feedback upon self-efficacy and 1RM bench press performance among high and low self-esteem college male weightlifters. The relationship between self-efficacy and performance change and the predictive value of each upon subsequent performance was also investigated. In this chapter, the findings of present study are summarized, followed by considerations of the implications of the findings and recommendations for future research.

#### Summary

From a pool of college male weightlifters with the ability to perform 1RM bench presses of weights from 200 to 350 lbs., 65 subjects volunteered to participate in the study. These subjects were randomly assigned to one of the three treatment groups for six trial sessions performed on three experimental days. Subjects were required to complete self-efficacy questionnaires prior to 1RM bench press performances (Fitzsimmons, 1989). At the start of each experimental session, a pre-session information questionnaire was also administered. Subjects were asked to provide their best performance efforts for the 1RM bench press task and weight values were recorded following each performance. Subjects were informed of either actual weight values, or values either lighter or heavier than

actually lifted, following the completion of each 1RM bench press performance. To examine the effects of false positive or false negative manipulation upon performance among high and low self-esteem weightlifters, the true objectives of the study were not revealed to the participants. Upon completion of all six sessions, each subject received \$10 for participation.

Statistical calculations based upon descriptive methods, analyses of variance, correlational analysis, and regression analysis were performed upon the collected data. The descriptive analyses (means and standard deviations) were implemented to summarize the demographic backgrounds of the subjects. Analyses of variance with repeated measures were developed for each performance and self-efficacy levels to determine the effects of false positive and negative feedback upon performance among high and low self-esteem subjects. Correlations between self-efficacy change and subsequent performance change and between performance change and subsequent performance change were analyzed. Regression analysis was used to determine whether self-efficacy change or previous performance change was a better predictor of subsequent performance change. The alpha level used to indicate acceptance or rejection of the hypotheses was .05.

Descriptive analysis indicated that the 65 volunteer subjects had at least four years of weightlifting experience and regularly lifted weights a minimum of four days per week. The ages of the subjects ranged from 18 to 35 years. Their average 1RM bench press performance was approximately 265 pounds. High and low self-esteem subjects demonstrated performance differences, but without significant differences in self-efficacy levels following administration of either positive, negative, or actual manipulative data. Overall, there were no significant differences between high and low self-esteem subjects for performance and self-

efficacy predictive changes. However, for specific variables the results were differentiated.

High self-esteem subjects performed tasks better than low self-esteem subjects. For subsequent performances, the weights lifted by high self-esteem subject decreased by approximately 2.45 lbs., whereas the equivalent decrease for low self-esteem subjects was approximately 4.65 lbs. Within-subjects analysis indicated that high self-esteem subjects increased performances following the receipt of false positive feedback only during sessions 3 to 4 (day 1), but performed without significant differences during sessions 5 to 6 (day 2). The effect of the first manipulative feedback may have influenced performance during the day 2 sessions. False negative feedback did not elicit poorer performance than actual feedback.

Subjects predicted their performances differently at all self-efficacy levels (100%, 75%, and 50%). Subjects predicted their performances differently after receiving alternating false positive and false negative feedback between days 1 and 2 (sessions 3 to 4 and 5 to 6). When subjects were asked to provide predictions prior to performance, the effects of both false positive and false negative feedback upon performance were clearly demonstrated. In addition, a correlation was found between self-efficacy change and subsequent performance change only for day 1 (sessions 3 to 4) following the first manipulative feedback. For the relationship of previous performance change to subsequent self-efficacy change, high self-esteem subjects demonstrated higher correlations than low self-esteem subjects.

An area of acute interest in the application of self-efficacy theory to the field of sport study is the determination whether self-efficacy or previous performance is the best predictor of subsequent performance (Fitzsimmons, 1989). For the present study, multiple regression analysis of the day 1 results (sessions 3

to 4) indicated that both self-efficacy changes at the 75 and 50 percent levels were good predictors of subsequent performance change, whereas self-efficacy at the 100 percent level as well as previous performance change were not. For the day 2 results (sessions 5 to 6), all three levels of self-efficacy were indicated as good predictors of subsequent performance change, which was again not true of previous performance change. Analysis of the results for both experimental days indicated that self-efficacy changes were better predictors of subsequent performances than were previous performances. To the extent that self-efficacy was indicated as a good predictor of subsequent performances, these findings supported the Bandura theory of self-efficacy.

### Research Implications

In the present study, false positive feedback had a positive effect on both self-efficacy and performance, and false negative feedback had a negative effect on self-efficacy and performance. From the viewpoint of self-efficacy theory, self-efficacy was found as the best predictor of subsequent performance. This contrasted with results of several other studies (Feltz, 1982, Feltz & Mugno, 1983) indicating that previous performance was a better predictor of subsequent performance. Self-efficacy was shown to be a stronger indicator of subsequent performance than previous performance. However, the repetitive trials paradigm used for the present study treated self-efficacy and performance similarly and for similar time periods. Even though Fitzsimmons (1989) suggested that self-efficacy would be a better predictor of subsequent performance in novel experimental situations where a repetitive trials study design was not used, this study showed different results.

Self-consistency theory was not supported by the results of this study. Individuals did not consistently retain their self-perceptions. For the present study, high self-esteem subjects did not exert extra effort to maintain their prior self-perceptions following the administration of false negative feedback. Nor were low self-esteem subjects affected by false negative feedback. Their performances did not differ from those of low self-esteem subjects who received actual feedback. In contrast, high self-esteem subjects were positively affected by false positive feedback, whereas low self-esteem subjects were not.

The results of the present study provide a number of practical implications, described below, for teachers, physical educators, and coaches:

1. Teachers, physical educators, and coaches should be aware that, when working with students or athletes, positive feedback is more effective than other types in relation to performance improvements.
2. Relative to the literature review on self-esteem, students or athletes with low self-esteem can be encouraged to believe that they are capable of performance improvements.
3. As a tool to decrease negative self-perceptions or to avoid performance plateaus, deception techniques should be subject to sparing and careful use.

### Recommendations for Future Research

Though every effort was undertaken to conduct the present study in a scientific and effective manner, a number of design limitations were encountered. Several suggestions for future research are as follows:

1. For purposes of accurate testing of theories of self-efficacy, future research study designs should be directed at novel situations.
2. To avoid a fatigue effect between sessions, only one or a few 1RM bench presses should be employed per session.
3. Cross cultural studies or studies with different age groups could be conducted to determine responses to manipulative feedback for different tasks.
4. The present study should be replicated using more subjects and employing higher and lower degrees of self-esteem.

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## APPENDICES

## Appendix A

Application for Approval by the Human Subjects Board,  
Oregon State University

## APPLICATION FOR APPROVAL OF THE OSU HUMAN SUBJECTS BOARD

Principal Investigator\* Dr. Vern Dickinson

Department Exercise and Sport Science Phone 737-6798

Project Title The Effects of False Positive and False Negative Feedback  
on Self-Efficacy and Performance of Low and High Self-Esteem  
 Present or Proposed Source of Funding None Powerlifters.

Type of Project Faculty Research Project

☒ Student Project or Thesis\*  
 (Student's name Waruepon Vongjaturapart)

The Oregon State University Human Subjects Board is charged with the responsibility of reviewing, prior to its initiation, all research involving human subjects. The Board is concerned with justifying the participation of subjects in research and protecting the welfare, rights and privacy of subjects.

All material, including this cover sheet, should be submitted **IN DUPLICATE** to the Research Office, AdS A312. Please call x7-3437 if you have questions. The following information must be attached to this form with each item identified and addressed separately or the application will be returned without review.

1. A brief description (one paragraph) of the significance of this project in lay terms.
2. A brief description of the methods and procedures to be used during this research project.
3. A description of the benefits (if any) and/or risks to the subjects involved in this research.
4. A description of the subject population, including number of subjects, subject characteristics, and method of selection. Justification is required if the subject population is restricted to one gender or ethnic group.
5. A copy of the informed consent document and a description of the methods by which informed consent will be obtained. The informed consent document must include the pertinent items from the "Basic Elements of Informed Consent" which is reproduced on the back of this form.
6. A description of the method by which anonymity of the subjects will be maintained.
7. A copy of any questionnaire, survey, testing instrument, etc. (if any) to be used in this project.
8. If this is part of a proposal to an outside funding agency, attach a copy of the proposal.

Signed Vern Dickinson Date 4-30-92  
 Principal Investigator\*

\*NOTE: Student projects and theses should be submitted by the major professor as Principal Investigator.

**Appendix B**  
**Informed Consent Form**

## Informed Consent Form

Dear Participant,

This study is designed to investigate maximal weight lifting performance on a bench press machine. The purpose of the study is to examine the effects of form and process cues during one repetition maximum weight lifting performance on a universal bench press machine. Prior to the experimental treatment, the participant is required to fill out a Self-Perception Profile (SPP) and a demographic information questionnaire. They will receive an introduction on the first day in order to understand the methods and procedures of the study. They will later be involved in four weight lifting sessions within two days. There is one rest day between the introduction and the first day of experimental procedure and between the second and the third day. Prior to each day of research, the participant will be asked to give pre-session information about their physical activities during the last 24 hours and to predict how much they can lift in a one repetition maximum bench press performance using one repetition maximum self-efficacy measure (1RM-EM) (see attached). The 1 RM-EM will be filled out every time before 1 RM performance. Then the participant will perform a one repetition maximum bench press on a bench press machine. Those who qualify to participate and complete the experiment will be paid ten dollars.

All information concerning subjects will be kept confidential. Only investigators will know the identity of the subjects. A video camera will be used to record during the lifting. The information about subject's own 1 RM performance will be given after each one repetition maximum performance. The result and debriefing about the study will be sent to all subjects by mail after all data are collected.

Any questions regarding the research study or participation in it will be answered by Naruepon Vongjaturapat (757-0162 or 737-2819) or by Dr. Vern Dickinson (737-6798) Department of Exercise and Sport Science, Langton Hall, Oregon State University.

There is a minimal risk of injury from participating in this study. The possible risk is delayed muscle soreness as a result of the weight lifting. In case of injury, any treatment and care will be provided at your own expense. The participant is free to discontinue the experiment at any time during this study. Your decision will not be questioned or penalized. Thank for your time and effort.

Naruepon Vongjaturapat

Dr. Vern Dickinson

I have read the above consent form and agree to participate.

\_\_\_\_\_  
Participant's Printed Name

\_\_\_\_\_  
Participant's Phone Number

\_\_\_\_\_  
Participant's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Participant's Address

## Appendix C

## Demographic Information and Weightlifting Experience Form

(Fitzsimmons, 1989, as modified)

Subject Number: \_\_\_\_\_

Age \_\_\_\_\_

Height \_\_\_\_\_ Weight \_\_\_\_\_ lb

Lifting Experience \_\_\_\_\_

Current Weightlifting Activity \_\_\_\_\_ days per week

Reason for Lifting

\_\_\_\_\_  
\_\_\_\_\_

Have you ever used any strength enhancing drugs? If yes, explain

\_\_\_\_\_

Have you ever had surgery for shoulder or chest (upper torso) injuries?

\_\_\_\_\_

Have you had an injury in the past six months that prevented you from  
performing for a week or more?

\_\_\_\_\_

Beside weightlifting, What physical activities do you have? (e.g., playing sports,  
jogging, bicycling, and etc)\_\_\_\_\_  
\_\_\_\_\_



## Appendix D

### Pre-Session Information

(Fitzsimmons, 1989, as modified)

Subject Number. \_\_\_\_\_

Session \_\_\_\_\_

Record the number of hours of sleep you got last night: \_\_\_\_\_

Have you maintained your normal eating habits in the time since your last session?

\_\_\_\_\_

Have you maintained your usual lifting patterns in the time since your last session?

\_\_\_\_\_

Have you engaged in alcohol, recreational drug, or prescription/nonprescription drug used in the time since your last session?

\_\_\_\_\_

## Appendix E

### Self-Perception Profile for College Students

## What I Am Like

Age \_\_\_\_\_

Subject Number \_\_\_\_\_

Male \_\_\_\_\_ Female \_\_\_\_\_

The following are statements which allow college students to describe themselves. There are no right or wrong answers since students differ markedly. Please read the entire sentence across. First decide which one of the two parts of each statement best describes you; then go to that side of the statement and check whether that is just sort of true for you or really true for you. You will just check ONE of the four boxes for each statement. Think about what you are like in the college environment as you read and answer each one.

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
1.	<input type="checkbox"/>	<input type="checkbox"/>	Some students like the kind of person they are	BUT	Other students wish that they were different.	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	Some students are not very proud of the work they do on their job	BUT	Other students are very proud of the work they do on their job.	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel confident that they are mastering their coursework	BUT	Other students do not feel so confident.	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	Some students are not satisfied with their social skills	BUT	Other students think their social skills are just fine.	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	Some students are not happy with the way they look	BUT	Other students are happy with the way they look.	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	Some students like the way they act when they are around their parents	BUT	Other students wish they acted differently around their parents.	<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	Some students get kind of lonely because they don't really have a close friend to share things with	BUT	Other students don't usually get too lonely because they do have a close friend to share things with.	<input type="checkbox"/>	<input type="checkbox"/>
8.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel like they are just as smart or smarter than other students	BUT	Other students wonder if they are as smart.	<input type="checkbox"/>	<input type="checkbox"/>
9.	<input type="checkbox"/>	<input type="checkbox"/>	Some students often question the morality of their behavior	BUT	Other students feel their behavior is usually moral.	<input type="checkbox"/>	<input type="checkbox"/>
10.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel that people they like romantically will be attracted to them	BUT	Other students worry about whether people they like romantically will be attracted to them.	<input type="checkbox"/>	<input type="checkbox"/>
11.	<input type="checkbox"/>	<input type="checkbox"/>	When some students do something sort of stupid that later appears very funny, they find it hard to laugh at themselves	BUT	When other students do something sort of stupid that later appears very funny, they can easily laugh at themselves.	<input type="checkbox"/>	<input type="checkbox"/>

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
12.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel they are just as creative or even more so than other students	BUT	Other students wonder if they are as creative.	<input type="checkbox"/>	<input type="checkbox"/>
13.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel they could do well at just about any new athletic activity they haven't tried before	BUT	Other students are afraid they might not do well at athletic activities they haven't ever tried.	<input type="checkbox"/>	<input type="checkbox"/>
14.	<input type="checkbox"/>	<input type="checkbox"/>	Some students are often disappointed with themselves	BUT	Other students are usually quite pleased with themselves.	<input type="checkbox"/>	<input type="checkbox"/>
15.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel they are very good at their job	BUT	Other students worry about whether they can do their job.	<input type="checkbox"/>	<input type="checkbox"/>
16.	<input type="checkbox"/>	<input type="checkbox"/>	Some students do very well at their studies	BUT	Other students don't do very well at their studies.	<input type="checkbox"/>	<input type="checkbox"/>
17.	<input type="checkbox"/>	<input type="checkbox"/>	Some students find it hard to make new friends	BUT	Other students are able to make new friends easily.	<input type="checkbox"/>	<input type="checkbox"/>
18.	<input type="checkbox"/>	<input type="checkbox"/>	Some students are happy with their height and weight	BUT	Other students wish their height or weight was different.	<input type="checkbox"/>	<input type="checkbox"/>
19.	<input type="checkbox"/>	<input type="checkbox"/>	Some students find it hard to act naturally when they are around their parents	BUT	Other students find it easy to act naturally around their parents.	<input type="checkbox"/>	<input type="checkbox"/>
20.	<input type="checkbox"/>	<input type="checkbox"/>	Some students are able to make close friends they can really trust	BUT	Other students find it hard to make close friends they can really trust.	<input type="checkbox"/>	<input type="checkbox"/>
21.	<input type="checkbox"/>	<input type="checkbox"/>	Some students do not feel they are very mentally able	BUT	Other students feel that they are very mentally able.	<input type="checkbox"/>	<input type="checkbox"/>
22.	<input type="checkbox"/>	<input type="checkbox"/>	Some students usually do what is morally right	BUT	Other students sometimes don't do what they know is morally right.	<input type="checkbox"/>	<input type="checkbox"/>
23.	<input type="checkbox"/>	<input type="checkbox"/>	Some students find it hard to establish romantic relationships	BUT	Other students don't have difficulty establishing romantic relationships.	<input type="checkbox"/>	<input type="checkbox"/>
24.	<input type="checkbox"/>	<input type="checkbox"/>	Some students don't mind being kidded by their friends	BUT	Other students are bothered when friends kid them.	<input type="checkbox"/>	<input type="checkbox"/>
25.	<input type="checkbox"/>	<input type="checkbox"/>	Some students worry that they are not as creative or inventive as other people	BUT	Other students feel they are very creative and inventive.	<input type="checkbox"/>	<input type="checkbox"/>
26.	<input type="checkbox"/>	<input type="checkbox"/>	Some students don't feel they are very athletic	BUT	Other students do feel they are athletic.	<input type="checkbox"/>	<input type="checkbox"/>

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
27.	<input type="checkbox"/>	<input type="checkbox"/>	Some students usually like themselves as a person	BUT	Other students often don't like themselves as a person.	<input type="checkbox"/>	<input type="checkbox"/>
28.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel confident about their ability to do a new job	BUT	Other students worry about whether they can do a new job they haven't tried before.	<input type="checkbox"/>	<input type="checkbox"/>
29.	<input type="checkbox"/>	<input type="checkbox"/>	Some students have trouble figuring out homework assignments	BUT	Other students rarely have trouble with their homework assignments.	<input type="checkbox"/>	<input type="checkbox"/>
30.	<input type="checkbox"/>	<input type="checkbox"/>	Some students like the way they interact with other people	BUT	Other students wish their interactions with other people were different.	<input type="checkbox"/>	<input type="checkbox"/>
31.	<input type="checkbox"/>	<input type="checkbox"/>	Some students wish their body was different	BUT	Other students like their body the way it is.	<input type="checkbox"/>	<input type="checkbox"/>
32.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel comfortable being themselves around their parents	BUT	Other students have difficulty being themselves around their parents.	<input type="checkbox"/>	<input type="checkbox"/>
33.	<input type="checkbox"/>	<input type="checkbox"/>	Some students don't have a close friend they can share their personal thoughts and feelings with	BUT	Other students do have a friend who is close enough for them to share thoughts that are really personal.	<input type="checkbox"/>	<input type="checkbox"/>
34.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel they are just as bright or brighter than most people	BUT	Other students wonder if they are as bright.	<input type="checkbox"/>	<input type="checkbox"/>
35.	<input type="checkbox"/>	<input type="checkbox"/>	Some students would like to be a better person morally	BUT	Other students think they are quite moral.	<input type="checkbox"/>	<input type="checkbox"/>
36.	<input type="checkbox"/>	<input type="checkbox"/>	Some students have the ability to develop romantic relationships	BUT	Other students do not find it easy to develop romantic relationships.	<input type="checkbox"/>	<input type="checkbox"/>
37.	<input type="checkbox"/>	<input type="checkbox"/>	Some students have a hard time laughing at the ridiculous or silly things they do	BUT	Other students find it easy to laugh at themselves.	<input type="checkbox"/>	<input type="checkbox"/>
38.	<input type="checkbox"/>	<input type="checkbox"/>	Some students do not feel that they are very inventive	BUT	Other students feel that they are very inventive.	<input type="checkbox"/>	<input type="checkbox"/>
39.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel they are better than others at sports	BUT	Other students don't feel they can play as well.	<input type="checkbox"/>	<input type="checkbox"/>
40.	<input type="checkbox"/>	<input type="checkbox"/>	Some students really like the way they are leading their lives	BUT	Other students often don't like the way they are leading their lives.	<input type="checkbox"/>	<input type="checkbox"/>
41.	<input type="checkbox"/>	<input type="checkbox"/>	Some students are not satisfied with the way they do their job	BUT	Other students are quite satisfied with the way they do their job.	<input type="checkbox"/>	<input type="checkbox"/>

	Really True For Me	Sort of True For Me				Sort of True For Me	Really True For Me
42.	<input type="checkbox"/>	<input type="checkbox"/>	Some students some times do not feel intellectually competent at their studies	BUT	Other students usually do feel intellectually competent at their studies.	<input type="checkbox"/>	<input type="checkbox"/>
43.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel that they are socially accepted by many people	BUT	Other students wish more people accepted them.	<input type="checkbox"/>	<input type="checkbox"/>
44.	<input type="checkbox"/>	<input type="checkbox"/>	Some students like their physical appearance the way it is	BUT	Other students do not like their physical appearance.	<input type="checkbox"/>	<input type="checkbox"/>
45.	<input type="checkbox"/>	<input type="checkbox"/>	Some students find that they are unable to get along with their parents	BUT	Other students get along with their parents quite well.	<input type="checkbox"/>	<input type="checkbox"/>
46.	<input type="checkbox"/>	<input type="checkbox"/>	Some students are able to make really close friends	BUT	Other students find it hard to make really close friends.	<input type="checkbox"/>	<input type="checkbox"/>
47.	<input type="checkbox"/>	<input type="checkbox"/>	Some students would really rather be different	BUT	Other students are very happy being the way they are.	<input type="checkbox"/>	<input type="checkbox"/>
48.	<input type="checkbox"/>	<input type="checkbox"/>	Some students question whether they are very intelligent	BUT	Other students feel they are intelligent.	<input type="checkbox"/>	<input type="checkbox"/>
49.	<input type="checkbox"/>	<input type="checkbox"/>	Some students live up to their own moral standards	BUT	Other students have trouble living up to their moral standards.	<input type="checkbox"/>	<input type="checkbox"/>
50.	<input type="checkbox"/>	<input type="checkbox"/>	Some students worry that when they like someone romantically, that person won't like like them back	BUT	Other students feel that when they are romantically interested in someone, that person will like them back.	<input type="checkbox"/>	<input type="checkbox"/>
51.	<input type="checkbox"/>	<input type="checkbox"/>	Some students can really laugh at certain things they do	BUT	Other students have a hard time laughing at themselves.	<input type="checkbox"/>	<input type="checkbox"/>
52.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel they have a lot of original ideas	BUT	Other students question whether their ideas are very original.	<input type="checkbox"/>	<input type="checkbox"/>
53.	<input type="checkbox"/>	<input type="checkbox"/>	Some students don't do well at activities requiring physical skill	BUT	Other students are good at activities requiring physical skill.	<input type="checkbox"/>	<input type="checkbox"/>
54.	<input type="checkbox"/>	<input type="checkbox"/>	Some students are often dissatisfied with themselves	BUT	Other students are usually satisfied with themselves.	<input type="checkbox"/>	<input type="checkbox"/>

## Appendix F

### Importance Ratings (Neewman & Harter, 1986, as modified)

## IMPORTANCE RATINGS

For these questions, think about how important these things are to how you feel about yourself as a person. These questions do not concern whether these things should be important, or whether it is a value one tries to live up to, or whether one appreciates these qualities in another person, or whether it is important to society. We want you to think whether these items really are important to you personally, and whether you behave as though they are important.

	REALLY TRUE FOR ME	SORT OF TRUE FOR ME				SORT OF TRUE FOR ME	REALLY TRUE FOR ME
1.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel it's important to be good at athletics	BUT	Other students do not feel athletics is all that important.	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	Some students do not feel that creativity is very important	BUT	Other students feel that creativity is important.	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	Some students think that it is important to be able to laugh at certain things they do	BUT	Other students do not think that being able to laugh at certain things they do is important at all.	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	Some students do not feel that the ability to establish romantic relationships is very important	BUT	Other students do feel the ability to establish romantic relationships is important	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel that behaving morally is important	BUT	Other students do not feel behaving morally is all that important.	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	Some students feel that being smart isn't all that important	BUT	Other students feel that it is important to be smart.	<input type="checkbox"/>	<input type="checkbox"/>



Remember, think about how important these areas to how you feel about yourself.

	REALLY TRUE FOR ME	SORT OF TRUE FOR ME			SORT OF TRUE FOR ME	REALLY TRUE FOR ME
7. <input type="checkbox"/>	<input type="checkbox"/>	Some students feel that it is important to be able to make really close friends	BUT	Other students do not feel that it is all that important to be able to make close friends.	<input type="checkbox"/>	<input type="checkbox"/>
8. <input type="checkbox"/>	<input type="checkbox"/>	Some students do not think that being able to get along with their parents is important	BUT	Other students do think it is important to be able to get along with their parents.	<input type="checkbox"/>	<input type="checkbox"/>
9. <input type="checkbox"/>	<input type="checkbox"/>	Some students feel that being good looking is important	BUT	Other students do not think that being good looking is very important.	<input type="checkbox"/>	<input type="checkbox"/>
10. <input type="checkbox"/>	<input type="checkbox"/>	Some students feel that being able to make new friends easily is not that important	BUT	Other students feel that being able to make new friends easily is important.	<input type="checkbox"/>	<input type="checkbox"/>
11. <input type="checkbox"/>	<input type="checkbox"/>	Some students feel that doing well at their studies is important	BUT	Other students do not feel that doing well at their studies is all that important.	<input type="checkbox"/>	<input type="checkbox"/>
12. <input type="checkbox"/>	<input type="checkbox"/>	Some students do not think that being good at their job is very important	BUT	Other students think it is very important to be good at their job.	<input type="checkbox"/>	<input type="checkbox"/>
13. <input type="checkbox"/>	<input type="checkbox"/>	Some students feel that it is not all that important to be good at sports	BUT	Other students feel that it is important to be good at sports.	<input type="checkbox"/>	<input type="checkbox"/>

Remember, think about how important these areas to how you feel about yourself.

	REALLY TRUE FOR ME	SORT OF TRUE FOR ME			SORT OF TRUE FOR ME	REALLY TRUE FOR ME
14. <input type="checkbox"/>	<input type="checkbox"/>	Some students feel that being inventive or creative is important	BUT	Other students do not feel that being inventive or creative is all that important.	<input type="checkbox"/>	<input type="checkbox"/>
15. <input type="checkbox"/>	<input type="checkbox"/>	Some students do not think it is important to be able to laugh at stupid things they do	BUT	Other students do think it is important to be able to laugh at stupid things they do.	<input type="checkbox"/>	<input type="checkbox"/>
16. <input type="checkbox"/>	<input type="checkbox"/>	Some students feel that being able to establish romantic relationships is important	BUT	Other students do not feel that being able to establish romantic relationships is all that important.	<input type="checkbox"/>	<input type="checkbox"/>
17. <input type="checkbox"/>	<input type="checkbox"/>	Some students do not think it is that important to live up to their moral standards	BUT	Other students think that living up to their moral standards is very important.	<input type="checkbox"/>	<input type="checkbox"/>
18. <input type="checkbox"/>	<input type="checkbox"/>	Some students think it is important to be bright	BUT	Other students do not think that being bright is all that important.	<input type="checkbox"/>	<input type="checkbox"/>
19. <input type="checkbox"/>	<input type="checkbox"/>	Some students feel that being able to make close friends they can really trust is not that important	BUT	Other students feel that being able to make close friends they can really trust is very important.	<input type="checkbox"/>	<input type="checkbox"/>
20. <input type="checkbox"/>	<input type="checkbox"/>	Some students think it is important to maintain a good relationship with their parents	BUT	Other students do not think it is all that important to maintain a good relationship with their parents.	<input type="checkbox"/>	<input type="checkbox"/>

Remember, think about how important these areas to how you feel about yourself.

	REALLY TRUE FOR ME	SORT OF TRUE FOR ME		SORT OF TRUE FOR ME	REALLY TRUE FOR ME
21. <input type="checkbox"/>	<input type="checkbox"/>	Some students feel appearance is not that important	BUT	Other students do feel appearance is important.	<input type="checkbox"/>
22. <input type="checkbox"/>	<input type="checkbox"/>	Some students feel it is important to be socially accepted	BUT	Other students do not feel that being socially accepted is all that important.	<input type="checkbox"/>
23. <input type="checkbox"/>	<input type="checkbox"/>	Some students think that it is not that important to be good at their classwork	BUT	Other students feel that being good at their classwork is very important.	<input type="checkbox"/>
24. <input type="checkbox"/>	<input type="checkbox"/>	Some students think that it is important to be responsible when working at their job	BUT	Other students do not think it is that important to be responsible when working at their job.	<input type="checkbox"/>

## Appendix G

### One Repetitive-Maximum Self-Efficacy Measure (Fitzsimmons, 1989)

Subject Number \_\_\_\_\_

At this point in time, the maximum weight I am 100% confident I can lift in a one repetition bench press is \_\_\_\_\_ lbs.

At this point in time, the maximum weight I am 75% confident I can lift in a one repetition bench press is \_\_\_\_\_ lbs.

At this point in time, the maximum weight I am 50% confident I can lift in a one repetition bench press is \_\_\_\_\_ lbs.

## Appendix H

### Debriefing

## Debriefing

This study was designed to investigate the influence of self-esteem on experienced weight lifters who received positive and negative performance information, and to determine the correlation between self-efficacy and 1 RM weight lifting performance. Self-esteem was assessed by the Self-Perception Profile for College Students (SPP) developed by Neumann & Harter (1986).

It was hypothesized that high and low self-esteem individuals would respond to the feedback differently. In fact, high self-esteem people would positively respond to either positive or negative feedback. Low self-esteem subjects, on the contrary, would respond negatively to either positive or negative feedback. Moreover, there would be a correlation between self-efficacy and subsequent 1 RM performance.

We would like to thank you for participation in this study and hope that you enjoy it. Also feel free to contact us if you have any additional questions about the study.

Naruepon Vongjaturapat

Dr. Vern Dickinson