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THE EFFECT OF EFFICACY EXPECTATIONS ON PERCEPTIONS OF CAUSALITY IN MOTOR PERFORMANCE

by

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CHAPTER 1

INTRODUCTION

Basic theoretical approaches to the study of motivation differ in the extent to which they consider mental processes instrumental in the understanding of behavior. The cognitive approach (Atkinson, 1964; Lewin, 1938; Tolman, 1938) assumes that individuals seek out information with which to construct a cognitive representation of the environment, and that this representation mediates behavior. The main element in the cognitive approach is the assumption that thought precedes action.

Various theoretical models propose possible explanations of motivation and achievement behaviors. Two theoretical models in particular appear to hold the most promise for increasing our understanding of motivation in social and sport psychology. These models are attribution theory (Weiner, 1979) and the theory of self-efficacy (Bandura, 1977). Attribution theory focuses on the naive psychology of the lay person who interprets and attempts to understand the events and behaviors encountered in every day life. The central assumption of attribution theory is that the search for understanding is the basis for action (Heider, 1958). That is, when we succeed or fail at an achievement task, we attempt to determine why we succeeded or failed. More specifically, we attribute outcomes to specific causes.

Weiner, Frieze, Kukla, Reed, Rest, and Rosenbaum (1971) classified causal attributions along a two-dimensional taxonomy based on the prior work of Heider's (1958) naive analysis of action, and Rotter's (1966) locus of control theory. Weiner et. al. (1971) theorized that success and failure in achievement situations are primarily attributable to four causal elements: luck, task difficulty, ability, and effort. These four causal elements fall along two dimensions: locus of control, and the stability of the element. The underlying causal properties or dimensions determine the choice of activities for future performance, the pride or shame experienced following the performance, the actual performance levels, and expectancies for future performance.

Weiner (1979) has since modified the 2 x 2 (locus x stability) taxonomy, adding a third dimension controllability, and reconceptualizing the locus dimension as locus of causality. In addition, recent investigations (Weiner, Russell, & Lerman, 1979 ; Roberts & Pascuzzi, 1979) recognized that many causal ascriptions, in addition to the four primary elements proposed by Weiner et. al. (1971), are possible. Russell (1982), recognizing the shortcomings of the previous attributional research, developed the Causal Dimension scale which allows the subject to become an active agent in the attribution process. This scale allows individuals to classify their causal attributions along the three dimensions of locus of causality, stability, and control.

A growing body of literature suggests that the attribute of ability may be the most important determinant of both affect and expectancy, and therefore, achievement behavior (e.g., Covington & Omelich, 1979; Nicholls, 1978; Roberts & Pascuzzi, 1979). Several investigators have (Bandura, 1977; Harter, 1981; Kukla, 1978; White, 1959) argued that ability attributions and the self-concept of ability play a central role in mediating behavior. This conceptualization, based upon Bandura's (1977) theory of self-efficacy, states that behavioral change is mediated by a common cognitive process, self-efficacy. Bandura (1977), defines self-efficacy as an individual's conviction that they can successfully execute the behaviors necessary to produce a certain outcome. Self-efficacy expectations strengthen expectations of mastery, which in turn affect both the effort expended in the face of adversive experiences, and the initiation of coping behaviors (Bandura, 1977).

Expectations of self-efficacy are based on four major sources of information (performance accomplishments, vicarious experience, verbal persuasion, and emotive and physiological arousal). Performance-based information is an important source of efficacy information because it is based on personal mastery experiences. However, individuals can gain competence through authentic means, but because of faulty appraisals of the circumstances under which they improve, credit their success to external factors rather than their own capabilities. Here lies the problem of inaccurate ascriptions of personal competency to situational factors. Successes attributed to skill rather than luck or external aids are more likely to enhance self-efficacy. Conversely, failures if attributed to internal rather that external circumstances result in reduced self-efficacy. Even under conditions of perceived self-control, self-efficacy expectations vary depending on whether the accomplishments are ascribed to ability or effort. Success with minimal effort fosters ability ascriptions that in turn reinforce self-efficacy. In contrast, successes achieved through high expenditure of effort indicate lack of ability and are likely to have a weakening effect on perceived self-efficacy.

Cognitive appraisals of the task can also affect the impact of performance accomplishments on perceived self-efficacy. To succeed at an easy task provides no new information for altering one's sense of self-efficacy whereas, mastery of a challenging task conveys evidence of increased competence. Cognitive processing of efficacy information is an especially relevant area for research. Persons high and low in self-efficacy adopt different strategies for performance involving the amount of effort they expend in achievement situations (Weinberg, Gould &

Jackson, 1979; Brown & Inouye, 1978). The extent to which ability and effort covary largely determines the perceived dimensionality of one's performance. For example, Weiner et. al. (1971) indicated that subjects given low ability and high effort information generally attributed their success to task ease. This attribution of task ease would then be classified along the three causal dimensions. It therefore seems quite possible that these perceptions of an individual's own level of self-efficacy are intimately related to causal explanations given for performance (Rejeski & Brawley, 1983).

Various sport attribution studies provide preliminary evidence to support the relationship between self-efficacy and performance (Harter, 1981; Nicholls, 1980; Roberts, Kleiber & Duda, 1981); satisfaction (Weiner, 1979; Nicholls, 1980; Harter, 1981); and persistence (Brown & Inouye, 1978; Schunk, 1981; Weinberg, Gould & Jackson, 1979; Weinberg, Gould, Yukelson, & Jackson, 1981). However, no evidence exists to indicate how self-efficacy expectations impact upon causal attributions for performance in sport-related achievement situations.

Sport attributional studies have predominantly employed Weiner et. al.'s (1971) two-dimensional model. Past research has generally listed the four causal elements of Weiner's model and it was assumed that these were the only important causes of sport outcomes. Recently however, Roberts and

Pascuzzi (1979) allowed individuals to freely state the causes of presented outcomes. The four elements identified by Weiner were among those new causal elements but comprised only forty-five percent of the total attributions in sports environments. Utilizing the Causal Dimension Scale (Russell, 1982) eliminates the constraint placed on subjects as far as the specific elements they view as important in assigning causes to outcomes.

In utilizing an attributional framework to examine causality, it is important to distinguish between success and failure, which are psychological interpretations of outcomes, and absolute winning and losing. In most sport attributional research, the criteria for success and failure has been whether subjects have won or lost in competition. Several investigators have indicated that winning and losing are not necessarily synonymous with success and failure (Roberts & Duda, 1984; Maehr & Nicholls, 1980). Roberts and Duda (1984), have suggested that an individual's perceived success and failure be assessed by performance satisfaction and perceptions of own and opponent performance.

The purpose of the study was threefold: (a) to determine if ratings of own and opponent performance are significantly related to individuals' perceptions of success and failure; (b) to examine the relationship between self-efficacy expectations and causal explanations for outcome in a competitive setting; and (c) to determine whether individuals high and low in self-efficacy differed in their perceptions concerning their own and opponents' ability.

Hypotheses

Consistent with the main purpose of this study, it was hypothesized that:

(1) There would be a stronger relationship between perceptions of own and opponent displayed ability and subjective success and failure (satisfaction) than between own and opponent displayed ability and absolute success and failure (win/loss).

(2) Winners would perceive their attributions as being more internal, stable, and controllable than losers.

(3) Individuals high in efficacy expectations would perceive their attributions as more internal, stable, and controllable than individuals low in efficacy expectations.

(4) Winners and individuals high in efficacy expectations would rate their own performance higher and their opponents' performance lower than losers or those low in efficacy expectations.

CHAPTER 2

REVIEW OF THE LITERATURE

A basic assumption concerning an individual's interaction with their social environment, is that they attempt to understand why it is that certain events occur. In their attempt to understand the environment, people utilize the process of inference, i.e., they infer the cause of some action in which they were involved. Once an inference is made, people come to some conclusion which helps them predict future behaviors and expected outcomes (Shaver, 1975).

The general label attached to these inferences in the psychological literature, and the process by which we make them, is causal attributions. Unfortunately, there is not a unified body of attributional knowledge that fits neatly under any one specific attribution theory. However, there are some commonalities among these theories that guide the thoughts of investigators in the field. That is, these investigators are concerned with an individuals' perceptions of causality and the perceived reasons for why a particular event occurred. Attribution theory is founded in Fritz Heider's early writings (Heider, 1944). Heider's attribution theory (1958) asserts that individuals actively seek to interpret and understand the behaviors of others. Heider believed that individuals cognitively appraise the behaviors of others, because attributions serve to simplify the individuals' perceptual world which would otherwise be impossibly complex.

The history of achievement motivation reflects a general trend toward a more cognitive approach to research. The work of Weiner (1971, 1972, 1979) illustrates this cognitive orientation, one in which causal attributions are seen as mediating cognitions between objective performance outcomes and subsequent achievement behavior. Utilizing attribution theory, Weiner and colleagues (1971) theorized that success or failure in achievement-related environments was primarily attributable to four causal elements: luck, ability, degree of effort, and task difficulty. These four causal elements were classified along two dimensions: locus of control and stability of the element. Ability and effort are internal factors, while task difficulty and luck are environmental or external factors. Ability and task difficulty were believed to be relatively stable and unchanging over time, while degree of effort and luck are variable.

On the basis of several studies since 1971 (Rosenbaum, 1972; Weiner, 1972), Weiner (1979) expanded the original framework from two to three dimensions: locus of causality (formerly locus of control), stability, and controllability. While investigations in sport have been guided largely by Weiner's original model they have with a few exceptions ignored these new developments (e.g., McAuley & Gross, 1983;

McAuley, Russell & Gross, 1983).

The remainder of this chapter is a review of the research in sport involving the cognitive approach of attributional theory. Consideration will be given to perceptions of success and failure, attributional elements, dimensions, and the influence of expectations in the attribution process.

Success And Failure In Sport

In sport attribution research, winning and losing has been the most consistently studied topic. In the studies that have been conducted to investigate how individuals determine the causes of their own and opponent's success or failure, winning and losing have been experimentally manipulated or have occurred in a natural setting. Success and failure have generally been regarded as being synonymous with winning and losing respectively. However, it has long been recognized that winning and losing do not necessarily connote success and failure (James, 1892).

To better understand individuals' perceptions of success and failure, a number of researchers (e.g., Spink & Roberts, 1980; Caulder & Straw, 1975; White, 1959), argued that the level of performance satisfaction be employed as the criteria for perceived success and failure. In doing so, subjects experiencing such outcomes become active agents in evaluating the degree of their personal success and failure. Utilizing Maehr and Nicholls' (1980) concept of success and failure as psychological states, as opposed to absolute outcome (win/loss), Spink and Roberts examined causal attributions for success and failure in a racquetball tournament. They identified four categories of players: satisfied winners, dissatisfied winners, satisfied losers, and dissatisfied losers. In addition to assessing causal attributions, they asked subjects to rate their own level of ability as well as the ability of their opponents. The data pertaining to ability were crucial to understanding the perceptions of success and failure of the participants. Satisfied winners were those individuals who had played against and beaten competent opponents. Dissatisfied winners, however, considered that they had competed against and beaten inferior opponents and attributed their winning to their opponents' lack of ability. Consequently, the win was viewed ambiguously by the individual and not regarded as a success. Losers had similar perceptions, feeling satisfaction with their performance if they perceived that they had demonstrated ability themselves. In this instance, an ambiguous loss was interpreted as a success because they lost to an opponent who was just that much better than they were. Losing to an opponent who was considered mediocre, was dissatisfying and therefore regarded as a failure.

The importance of these findings was obvious when the causal attributions were analyzed. Clear outcomes were attributed to internal causes, while ambiguous outcomes were attributed to external causes. Spink and Roberts (1980) drew two important conclusions from this study. First, outcomes must not be confused with perceptions of success and failure, and second, ability seemed to be the most crucial perception affecting the psychological states of success and failure. This latter contention however, was not directly tested due to limitations in the design of their study. In a follow-up study, Roberts and Duda (1984) attempted to determine the importance of being able to assign ability to one's own performance in interpreting outcomes as success or failure in a sport context. Their research involved a field study with men and women racquetball players. Results indicated that perceptions of demonstrated ability were significantly related to perceptions of success and failure for both men and women. The only other variable which significantly contributed to the prediction of success and failure was the perception the individual had concerning the amount of ability demonstrated by their opponent. Outcome in the game failed to account for a significant portion of the variance in the prediction of subjective success and failure. This supports previous research which questions the use of objective outcomes as the sole criterion of success and failure in competitive sport environments (Rejeski & Lowe, 1980).

In a recent study, McAuley (1985) found that perceived success in gymnastics significantly influenced how gymnasts' perceived the causes of their performance.

Individuals who perceived their performance as being highly successful made internal, controllable, and stable attributions. However, individuals who perceived their performance as being unsuccessful made internal, controllable, but unstable attributions. McAuley concluded that when ability levels are controlled for, individuals may use information concerning effort attributions in perceiving performance as successful. McAuley also suggested that it is conceivable that perceptions of success in field settings are more accurate and more susceptible to the influence of situation-specific factors than perceptions of success in an artificial achievement situation.

Causal Elements In Sport

It has been erroneously assumed by researchers in sport and physical activity that the four principal causes of ability, effort, task difficulty, and luck (Weiner et. al., 1971) are the only causal attributions used to explain outcomes. These causal elements are not however, as Weiner (1979) has pointed out, the only ones individuals' would use if responding freely. As an active agent in the attribution process, the subject may explain achievement outcome with a wide assortment of descriptive explanations.

Roberts and Pascuzzi (1979) asked individuals to respond freely when stating the causes of presented sport outcomes. Eleven causal attributes emerged, and even though the four elements identified by Weiner et. al. (1971) were included, they comprised only forty-five percent of attributions in sports environments. Bukowski and Moore (1980) also indicated that subjects use a diverse set of responses to explain achievement outcomes.

Although not in a sport setting, a recent study by Lochel (1983) indicated individuals make a distinction between attributions to (general) ability vs. (specific) knowledge. In Lochel's study, general ability was used in only 4% of the cases compared with 27% for the specific knowledge attributions. This points to a shortcoming in the conventional classification scheme which refers only to general ability, although specific ability/knowledge can be changeable through internal and external factors.

Knowing the causal attributions given for an outcome is important for the understanding of perceptions. However, because attributional elements often assume different meanings in different environments, the understanding of the dimensions used to categorize outcomes is of paramount importance in verifying the theoretical perspectives in the attribution literature.

Causal Dimensions

The use of causal dimensions is an important aspect of attribution theory, because the underlying properties (dimensions) of causal attributions tell us much more about the differences and similarities of attributions then do the attributions themselves. Research supporting relationships between causal dimensions and the consequences of the attribution process, such as affective reactions and expectancies, suggest that people do process information concerning causality in terms of causal dimensions. Various studies involving factor analytic and multidimensional scaling techniques have supported Weiner's three dimensional taxonomy (Passer, 1977; Michela, Peplau & Weeks, 1982; Meyer, 1980). It is therefore possible to assess directly how the attributor perceives their own causal attributions in terms of these three causal dimensions (Kruglanski, 1980).

Sport psychologists interested in attribution research have largely failed to recognize that a subject's personal interpretation of, and response to, questions regarding outcomes are key pieces of information when assessing causal attributions. Elig and Frieze (1979) contended that open-ended questioning could be used to ascertain the causal factors that form the basis for item development relating to causal scale construction. This would allow subjects to become active participants in scale construction rather than merely respondents constrained in advance by the researcher (Rejeski, Rae, & McCook, 1981). The assumption that researchers are capable of accurately coding causal dimensions is one which has troubled much of the attributional research in the past. Furthermore, the meaning of causal elements is often quite ambiguous leading to difficulty in processing them into the proper causal dimension (Ross, 1977; Jones & Nisbett, 1972).

Russell (1982), recognizing the shortcomings of the previous attributional research, developed a scale which allows the attributor to assess the causes of an event. The Causal Dimension Scale assesses causal perceptions in terms of the locus of causality, stability, and controllability. The Causal Dimension Scale is a 9 item questionnaire which represents the causal dimensions by way of three subscales.

Participants in Russell's (1982) study were undergraduate students who completed a questionnaire that consisted of descriptions of eight achievement situations. The achievement situations consisted of an outcome and one of eight causal attributions. While imagining themselves in each situation, the students evaluated the cause of the success or failure outcome on twelve semantic differential scales. All three subscales were found to be reliable and valid, and a three mode factor analysis confirmed the three-dimensional structure of the scale.

McAuley and Gross (1983), in the first study in a sport setting to utilize the Causal Dimension Scale (Russell, 1982), found it to be a valid measure of how individuals' perceive attributions in terms of causal dimensions. Although the findings showed that the locus of causality and stability dimensions were being reliably assessed, the control dimension was less accurate. This may be in part because in athletic situations, controllability may be less clear cut and more difficult to assess than in academic situations (McAuley & Gross, 1983).

According to Weiner and others, (e.g., Forsyth & McMillan, 1981; Russell, 1982; and Weiner et. al., 1979) the locus of causality dimension determines affective reactions to outcomes, while the stability dimension determines the expectancies for future performance. Success associated with effort and ability increase an individual's feeling of pride, but each element leads to a different expectation of future performance. Success associated with ability leads to expectations of similar performance in the future because ability is a stable element. Success associated with effort, however, does not elicit similar performance expectations because effort is an unstable element. Similarly, success associated with luck and task difficulty decrease feelings of pride because these elements are external to the individual. Future performance expectations are affected by the stability dimension, with task difficulty leading to the expectation of similar performance, and luck leading to performance expectations which are dissimilar.

McAuley, Russell and Gross (1983), in contrast to previous findings (Weiner et. al., 1979), reported that the locus of causality dimension was not an important determinant of affect. Instead, the control dimension appeared to be the most important causal dimension in this respect. Several possible explanations for this difference in findings exist. McAuley, et. al. (1983) indicated that in this study, unlike previous experimental studies (where subjects were assigned to conditions involving both internal and external attributions for outcomes), subjects had a tendency to focus upon internal causes in explaining actual success and failure. Another possible explanation lies in the fact that sport settings involve interpersonal relationships which do not exist in academic achievement situations. This difference may make individuals more aware of the importance of effort or perceived control, thereby affecting the reactions to winning and losing. Whatever the reason, additional experiments are needed to determine whether or not these differences exist across various sport and physical activity settings (McAuley et. al., 1983).

Self-efficacy In Sport

A relatively new direction in the study of motivation with particular potential for sport research is one that utilizes the concept that ability attributions and the individual's level of self-efficacy play a central role in the mediation of motivation. Various terms have been used to describe this construct (such as self-concept of ability, perceived ability, perceived competence), but for the purpose of uniformity, the term self-efficacy will be used.

Bandura (1977) stated that behavioral change is mediated by a common cognitive mechanism, self-efficacy. Self-efficacy is defined as a person's conviction that they can successfully execute a behavior required to produce a certain outcome. People's beliefs about their abilities influence how they behave, their thought patterns, and the emotions they experience in various situations. Those who regard themselves as highly efficacious seek out new and challenging situations (Bandura, 1977), intensify their efforts when their performance falls short of their desired goals (Bandura & Cervone, 1983), persevere despite repeated failure (Brown & Inouye, 1978; Schunk, 1981) and make causal ascriptions which support a success orientation (Collins, 1982).

A wide range of research provides corroborating evidence for the notion that perceived self-efficacy is a significant mediator of behavior. The role of self-efficacy in coping behavior has been studied extensively by Bandura (1977). In these studies, self-efficacy was found to be highly significant in predicting behavioral change for different treatments across a wide range of subjects. Another line of research concerns the relationship between self-efficacy and academic attainment. The findings show that perceived self-efficacy contributes significantly to performance requiring cognitive skills. Numerous studies have been conducted in which self-efficacy has been enhanced for children with cognitive skill deficits through the use of enacted mastery (Bandura & Schunk, 1981; Schunk, 1981, 1983). The role of self-efficacy in the execution of skilled performance during competition is another domain of achievement behavior which has been actively explored (Feltz, Landers & Raeder, 1979; McAuley, 1985). The fact that a high sense of self-efficacy is a major contributor to optimal performance has long been recognized by athletes and coaches alike. After skills are mastered, perceived self-efficacy is often the difference between a good and poor performance in athletic competition.

Throughout the varying domains, individuals adopt different strategies for performance involving ability and effort. Motivation, which is mainly concerned with the activation and persistence of behavior is partly rooted in cognitive processes. The capacity to represent future consequences in thought is one such cognitive source of motivation. Through cognitive representation of future outcomes, individuals can motivate themselves largely by creating expectations that behaving in a certain way will produce anticipated benefits or avert future difficulties (Bolles, 1972).

Although self-efficacy theory (Bandura, 1977) provides the framework for examining the effects of efficacy on performance, relatively few studies have examined the relationship between expectations and athletic performance. Feltz, Landers, and Raeder (1979) conducted one of the first studies to test Bandura's theory in a sport situation. The study investigated the effectiveness of live, participant and video-taped modeling on the strength of self-efficacy and the learning of a high-avoidance, springboard diving task. Although the method found a relationship between the participant modeling technique and stronger expectations of personal self-efficacy, the design did not allow causal inferences to be made about the relationship between self-efficacy and performance.

Weinberg, Gould and Jackson (1979) conducted the first test of the theory of self-efficacy in a competitive situation. Self-efficacy was manipulated by having subjects compete against a confederate on a muscular leg-endurance task where the confederate was said to be either a varsity track athlete (low self-efficacy condition) or an individual who had just undergone knee surgery (high self-efficacy condition). Because self-efficacy theory predicts that expectation-performance differences are maximized in the face of adversive consequences, the experiment was biased so that the subjects lost in competition on both trials. The results supported self-efficacy predictions, with the high self-efficacy subjects extending their legs significantly longer than the low self-efficacy subjects.

In the previous investigation (Weinberg et. al., 1979), efficacy expectations were manipulated by structuring the environment to create feelings of either high or low efficacy. Weinberg, Gould, Yukelson and Jackson (1981), investigated the interaction of pre-existing and manipulated self-efficacy in a competitive sport performance. Although both pre-existing and manipulated self-efficacy significantly influenced performance, their effects were dependent on the trial being performed. Pre-existing self-efficacy influenced performance only on trial one, and manipulated self-efficacy only on trial two. These results indicated that while initial self-efficacy expectations influenced initial trials, once information was gained relative to one's opponent and difficulty of the task, environmentally manipulated self-efficacy expectations had a greater effect on subsequent performance.

According to Bandura (1977), self-efficacy also mediates changes in arousal. Bandura has suggested that low efficacy is generally accompanied by high performance arousal, whereas high levels of efficacy are associated with low performance arousal. Because high levels of arousal have detrimental effects on performance, Yan Lan and Gill (1984) studied the influence of self-efficacy on physiological arousal and self-reported anxiety. Their findings clearly revealed that easy tasks elicited higher self-efficacy expectations than did difficult ones. Individuals perceiving the tasks as easy, reported lower cognitive and somatic anxiety and higher self-confidence than did individuals perceiving the task as difficult. Their findings supported self-efficacy predictions for the relationship between self-efficacy and stress responses in a competitive situation using a sport-specific and multidimensional state-anxiety scale. This self-efficacy-stress relationship is important because both stress responses and self-efficacy are related to performance. Yan Lan and Gill (1984) suggest that instead of trying to reduce anxiety levels alone, as is the case in most current coping strategies, techniques for enhancing self-efficacy should also be examined.

In an attempt to make self-efficacy more situation specific, Ryckman, Robbins, Thorton, and Cantrell (1982) developed the Physical Self-Efficacy Scale, a measure of an individual's perceived physical self-confidence (see Appendix A). Ryckman and colleagues suggested that general self-efficacy is related to performance on simple motor tasks, but that a more sport-specific measure for self-efficacy was necessary to predict performance on more complex physical activities such as sports and athletics. The test consists of a Perceived Physical Ability (PPA) and a Physical Self-Presentation Confidence (PSPC) subscale. Higher scores on the PPA indicate higher perceived physical ability, while higher scores on the PSPC reflect an individuals greater degree of confidence in the presentation of physical skills. The two subscales are related, and when summed yield an overall measure of Physical Self-Efficacy (PSE). Both subscales and the composite PSE demonstrated adequate reliability and validity, with resultant coefficient alphas of .84 for the PPA, .74 for the PSPC, and .81 for the PSE.

McAuley and Gill (1983) compared the Physical Self-Efficacy Scale to a more task-specific measure of self-efficacy in a competitive sport setting. While they found that the PSE was a reliable and valid instrument in measuring general physical self-efficacy in women's gymnastics, a task specific measure of self-efficacy and the gymnast's predictions of how they would perform were more powerful predictors of actual performance. An assessment of the internal consistency of the two subscales of the PSE demonstrated an adequate reliability for the PPA (.76). The PSPC however, had a rather low alpha coefficient (.42) and should be suspect in future studies involving sport competition.

While these studies suggest that there is preliminary evidence for the relationship between self-efficacy and outcome and persistence in competitive situations, more research is required to determine if self-efficacy is a useful construct in the understanding and investigation of achievement attributions than the more traditional construct of global achievement behavior (McFarlin & Blascovich, 1981).

CHAPTER 3

METHOD

The purpose of the chapter is to outline the procedures employed in the study. The chapter is broken down into the following sections: (a) subject selection; (b) task; (c) conditions; (d) dependent measures and; (e) procedures.

Subjects

Eighty-four male (N=45) and female (N=39) university undergraduate students, age 18 to 27 ($\overline{X}$=18.8), volunteered to participate as subjects for this experiment. Subjects were enrolled in an introductory physical education class and received extra-credit points for participation.

Task

Several criteria were used in the selection of the task and equipment utilized in this study. The task had to be appropriate for individuals of varying abilities, allow the researcher freedom to manipulate outcome (win-loss), and be easy enough to allow all subjects to finish the testing session without becoming exhausted.

The task chosen was a slightly modified version of a bicycle ergometer task utilized by Corbin and Nix (1979). A Quinton Monarch ergometer was used and the workload set at 350 KPM. Success and failure were electronically manipulated by the experimenter. The bicycle ergometers were wired to a portable scoreboard via a manipulation panel. The scoreboard included a timer, and was able to register scores for each of the 2 bicycle ergometers simultaneously. The scoreboard was placed directly in front of the subjects allowing them to see their own and opponent's score as it accumulated, as well as the time remaining in each competitive trial. A screen separated the bicycle ergometers so that the subjects could see each other only from the chest up, concealing apparent differences in peddling rates. The electronic panel allowed for a manipulation of the percentage of total score displayed.

A pilot study was conducted to test the equipment and to standardize procedures to be used in the study. The pilot study indicated that when registering speeds above 40 kilometers per hour, the counting device was unable to record the subjects' scores. To counteract this limitation, the workload on the bicycle ergometer was set at 350 KPM. In addition, reducing performance scores by 40% on one cycle insured control over the treatment manipulation.

Experimental Conditions

Subjects were randomly assigned to one of four treatment conditions: 1) high efficacy expectation-success outcome, 2) low efficacy expectation-failure outcome, 3) high efficacy expectation-failure outcome, and 4) low efficacy expectation-success outcome. Efficacy expectations were manipulated into two conditions: high self-efficacy and low self-efficacy. Subjects in the high efficacy expectation condition "won" all three practice trials, while subjects in the low efficacy expectation condition "lost" all three performance trials. This manipulation was accomplished by setting the bias on the equipment so that one of the bikes registered only 60% of its' revolutions. In addition, subjects were assigned to one of two outcome conditions in which subjects' scores were manipulated so that they either "won" or "lost" in the actual competition.

Dependent Measures

The following questionnaires evaluated subjects' perceptions in the present study: The Perceived Physical Ability Subscale of the Physical Self-Efficacy Scale (Ryckman et. al., 1982, see Appendix B), a task-specific self-efficacy measure designed especially for the bicycle ergometers (see Appendix C), a precompetition and postcompetition questionnaire, and the Causal Dimension

Scale (Russell, 1982 , see Appendix F).

Perceived Physical Ability Subscale. Because the internal consistency of the Physical Self-Presentation Confidence subscale has been shown to be suspect in competitive sport settings (McAuley and Gill, 1983), the present study utilized only the Perceived Physical Ability Subscale (PPA). The Perceived Physical Ability Subscale consists of ten items with a range of scores from 10 to 60. Higher scores on the scale indicate individuals' higher perceptions of their own physical ability.

Task-Specific Self-Efficacy Scale. The task-specific measure assessed the individual's perceptions of their ability with regard to the bicycle ergometer. The scale consisted of four items related to the subject's ability to generate speed, strength, and endurance with scores ranging 4 to 20. The scale was constructed along the guidelines suggested by Bandura (1977), and a number of other researchers (e.g., McAuley, 1982; McAuley & Gill, 1983).

Precompetition Questionnaire. The precompetition questionnaire (Appendix D) assessed the subjects' expectations for winning or losing, and their predictions for how well they would perform in the competition. Subjects also indicated the degree of importance placed upon both winning the competition, and performing well. All questions were answered on 9-point Likert scales.

Postcompetition Questionnaire. The postcompetition questionnaire (Appendix E) examined the subjects' perceived satisfaction in the competition, their ratings of personal ability, and perceptions of their opponent's ability. All questions were answered on 9-point Likert scales.

Causal Dimension Scale. The Causal Dimension Scale (CDS) (Russell, 1982; see Appendix F) assesses causal perceptions along the dimensions of locus of causality, stability and controllability. The scale consists of nine items, three of which are related to each dimension. Scores for each dimension range from 3 to 27. Higher scores on each subscale reflect the cause to be perceived as internal, stable, and controllable.

Procedures

Each testing session consisted of a competition between two same sex subjects. Subjects were advised of their rights and notified that they could at any time withdraw from the study without penalty. Informed consent (see Appendix H) was obtained and the competition explained. The subjects stood beside the bicycles while the experimenter explained and demonstrated the task in the presence of both subjects (Appendix J).

Subjects then completed the Perceived Physical Ability Subscale and the task-specific measure of self-efficacy.

When both subjects had completed the questionnaires, they were given three practice trials on the bicycle, each 15 seconds in length. Subjects examined each bicycle ergometer before the start of testing to insure that their opponent would not have an "edge" in the competition. During the testing however, the bicycle ergometers were partially screened to conceal apparent differences in peddling rate. Subjects were instructed to focus their attention on the scoreboard while performing.

At the beginning of each trial, the experimenter moved to the manipulation panel concealed behind the bicycle ergometers and signaled the subjects to begin. On the word "GO" the timer started. Conditions were manipulated so that one subject either "won" or "lost" all of the practice trials. The manipulation was accomplished by biasing one of the bicycles to register only 60% of it's score. Subjects then received a short rest period before the start of the actual competition. During this rest period, the precompetition questionnaire and a manipulation check were administered. At this time the experimenter reset the manipulation panel according to the subjects assigned condition.

To determine the effectiveness of the manipulation and efficacy expectations, subjects answered two questions prior to competition: 1) "Do you think you will beat your opponent in the upcoming competition?"; and 2) "How confident are you of this prediction?" The latter question required the subjects to respond on a 9-point Likert scale ranging from "not at all" to "very much so." Responses were recorded in private to minimize the demand characteristics of the situation.

Upon completion of the precompetition questionnaires, the subjects returned to their respective cycles and readied them for the actual competition. Subjects were again reminded of the testing protocol and instructed to focus their attention on the scoreboard. They were informed that the competition was the best two-out-of-three, and once one of them had won two trials the competition would be over. Results were manipulated so that one subject either "won" or "lost" the first two trials, making a third trial unnecessary.

Following competition, subjects received a short rest period and completed the postcompetition questionnaire assessing perceived ratings of satisfaction, own performance and opponent performance. All responses were made on a 9-point Likert scale. Subjects then completed the Causal Dimension Scale (Russell, 1982).

Upon completion of testing, subjects were debriefed using a protocol approved by the University Human Subjects Committee (see Appendix G). Any questions the subjects had concerning the study were answered and each subject was asked not to discuss the nature of the testing session with others until all subjects had been tested. The actual debriefing consisted of showing the subjects how the performance scores were manipulated, explaining why this manipulation was necessary to the integrity of the study, and assurances that the test in no way reflected their actual physical abilities.

CHAPTER 4

RESULTS

The data were analyzed in two phases. Preliminary analyses were conducted to examine: (a) manipulation of efficacy expectations, (b) correlation between self-efficacy measures, and (c) sex differences in efficacy expectations and measures of self-efficacy. The second phase of data analysis tested the hypotheses stated in Chapter 1. These results are presented under the following headings: (a) relationship between absolute and subjective success and failure, (b) effects of outcome and efficacy expectations on perceptions of causality; and (c) effects of outcome and efficacy expectations on perceptions of own and opponent performance. All $\underline{F}$ statistics reported for the multivariate analyses of variance (MANOVA) are approximations based on Wilks's Lamda criterion.

Manipulation of Efficacy Expectations

A one-way MANOVA examining differences between high and low efficacy groups for their expectancies for winning and losing and for performance was significant, $\underline{F}(15,210)=3.85$, $p<.0001$. Subsequent univariate analyses indicated significant differences between conditions for expectations of winning and losing, $\underline{F}(3,30)=19.31$, $p<.0001$; confidence in that prediction $\underline{F}(3,30)=11.58$, $p<.0001$; and expectations of how well they would perform in the competition,

$\underline{F}(3,30)=5.60$, $p<.001$.

As can be seen in Table 1, individuals in the high expectancy condition (condition 1 and 3) generally expected to win while individuals in the low expectancy condition (condition 2 and 4) generally expected to lose. Responses were coded so that a one (1) indicated subjects' expectations of winning in the competition, while a two (2) indicated expectations of losing. In addition, individuals in the high expectancy condition were more confident in their predictions and expected to perform better than the subjects in the low self-efficacy condition. Thus, it appears that the manipulation of efficacy expectations was effective.

Table 1

Mean Scores For Expectancies By Condition

	WIN/LOSS EXPECTANCIES		PREDICTION CONFIDENCE		PERFORMANCE EXPECTANCIES	
	MEAN	SD	MEAN	SD	MEAN	SD
CON1	1.00	0.00	6.57	1.32	6.85	1.31
CON2	1.60	0.50	4.65	1.69	5.65	1.03
CON3	1.08	0.28	6.60	1.26	6.43	1.16
CON4	1.70	0.47	4.65	1.72	5.40	1.63

CON1 = Win/Win
CON2 = Lose/Lose
CON3 = Win/Lose
CON4 = Lose/Win

Relationship Between Measures of Self-Efficacy

Pearson Product-Moment Correlation Coefficients were calculated to examine the relationship among the self-efficacy measures and efficacy expectations resulting from the experimental manipulation. As can be observed in Table 2, the correlation coefficients were all significant ($p<.0001$). Perceived Physical Ability (PPA) correlated positively with the task-specific measure ($r=0.595$) and with manipulated self-efficacy expectations ($r=0.410$). The task-specific measure correlated positively with manipulated self-efficacy expectations ($r=0.405$).

Table 2

Correlations Among Physical Self-Efficacy (PPA), Task-Specific Self-Efficacy (TSSE), And Expectancies For Winning And Losing

	TSSE	PPA	EXPECTANCIES
TSSE	1.000	0.595 *	0.405 *
PPA		1.000	0.410 *
EXPECTANCIES			1.000

p<.0001 *

TSSE = Task-specific self-efficacy
PPA = Perceived Physical Ability Subscale of the Physical Self-Efficacy Scale
EXPECTANCIES = Manipulated self-efficacy expectations

Sex Differences In Self-Efficacy Measures And Efficacy Expectations

To determine if significant sex differences existed in the responses to questions regarding causal dimensions, self-efficacy expectations, and perceptions of performance, multivariate analysis of variance techniques were utilized. The first overall MANOVA examining differences between sex and efficacy expectations was significant $F(8,75) = 2.13$, $p > .04$. Univariate analyses revealed that although there were no differences between sex and the effectiveness of the efficacy manipulation, $F(1,82) = 3.51$, sex differences did emerge for subjects' confidence in their efficacy prediction, $F(1,82) = 5.82$, $p > .01$, and how well they expected to perform on the bicycle task, $F(1,82) = 9.86$, $p > .002$. As indicated in Table 3, mean scores for sex differences on efficacy expectations show that males were more confident in their efficacy expectations, and expected to perform better than females.

The second MANOVA examining differences between sexes on their causal explanations and self-efficacy measures was also significant, $F(7,76) = 2.76$, $p > .01$. Subsequent univariate analyses for the self-efficacy measures indicated significant differences between sexes for both the PPA, $F(1,892) = 18.42$, $p > .0001$, and the TSSE, $F(1,82) = 6.57$, $p > .01$. Mean scores shown in Table 3 indicate that males rated themselves significantly higher on both the general physical, and the task-specific measures of self-efficacy. However, there were no sex differences in perceptions of causality.

Table 3

Mean Scores For Measures Of Self-Efficacy And Efficacy Expectations By Sex Of Subject

	MALES		FEMALES	
	MEAN	SD	MEAN	SD
CON PRE	6.08	1.75	5.17	1.68
PER EXP	6.53	1.30	5.61	1.36
PPA	45.48	5.78	39.05	7.91
TSSE	16.40	2.80	14.76	3.02

CON PRE = Confidence of prediction
PER EXP = Performance expectations
PPA = Perceived physical ability
TSSE = Task-specific self-efficacy

Relationship Between Absolute and Subjective Success and Failure

Correlation coefficients (Table 4) were calculated to test the hypothesis concerning the relationship between absolute outcomes (winning and losing) and measures of subjective success and failure (satisfaction, own performance, and opponent performance). The correlation coefficients were all significant ($p>.0001$).

Table 4

Correlations Among Absolute Outcome And Subjective Success and Failure

	SATIS	OPPER	OWNPER	WN/LS
SATIS	1.000	-0.484*	0.890*	0.844*
OPPER		1.000	-0.448*	-0.680*
OWNPER			1.000	0.798*
WN/LS				1.000

p<.0001*

SATIS = Satisfaction with performance
OPPER = Perceived opponent performance
OWNPER = Perceived own performance
WN/LS = Absolute outcome of winning or losing

Satisfaction correlated positively with both own performance (r=0.89) and winning and losing (r=0.84). The correlations, however, were negative between satisfaction and opponent performance (r=-0.48). Similar negative correlations existed between perceptions of opponent performance and own performance (r=-0.44), and between opponent performance and winning and losing (r=-0.68). These findings indicate that both winners and subjects who felt they had performed well were more satisfied than those who lost or felt they had performed poorly. The negative correlations indicate that an opponent was viewed as having exhibited greater ability by those individuals who either lost in the competition, or thought they had performed poorly.

Effects of Outcome and Efficacy Expectations on Perceptions of Causality

In order to test the hypothesis concerning the effect of both self-efficacy expectations and outcome on subjects' perceptions of causality, a 2 x 2 MANOVA (condition x outcome) was employed, with the locus of causality, stability, and control dimensions as dependent variables. The MANOVA for the effect of win/loss on perceptions of causality was significant, $F(3,78)=11.96$, $p>.0001$. Univariate analyses indicated significant differences between winners and losers on both the stability, $F(3,80)= 22.88$, $p>.0001$, and control dimensions, $F(3,80)=19.10$, $p>.0001$. Mean scores on the causal dimensions (see Table 5) indicated that while winners generally made more stable and controllable attributions than losers, attributions for both winners and losers were of an internal, unstable, and controllable nature.

Table 5

Mean Scores On Causal Dimensions For Winners And Losers

	LOCUS		STABILITY		CONTROL	
	MEAN	SD	MEAN	SD	MEAN	SD
WINNERS	21.34	4.31	12.43	5.40	20.97	3.77
LOSERS	20.76	3.85	7.88	3.19	16.86	4.69

Effects of Outcome and Efficacy Expectations on Perceptions of Own and Opponent Performance

A one-way MANOVA examining the effect of outcome on perceptions of own and opponent performance was significant $F(2,79) = 140.56$, $p > .0001$. Univariate analyses revealed that there were significant differences between winners and losers in their postcompetition perceptions of their own ability, $F(3,80) = 141.32$, $p > .0001$, and opponent's ability $F(3,80) = 76.30$, $p > .0001$. Winners rated their own performance significantly higher than losers, and viewed their opponents as displaying significantly less ability (see Table 6).

The overall MANOVA examining the effect of manipulated efficacy expectations on perceptions of own and opponent performance was also significant, $F(2,79) = 4.28$, $p > .01$. Subsequent univariate analyses revealed that a significant difference existed between efficacy expectancy groups and their perceptions of their opponents ability, $F(3,80) = 6.76$, $p > .01$, but not their perceptions of own displayed performance. Results indicate that those who expected to lose in the competition rated their opponents' performance as being significantly higher than those who expected to win. No such differences emerged for the ratings of their own performance. Mean scores for efficacy expectations on perceptions of own and opponent performance are shown in Table 6.

Table 6

Mean Scores For Winning Or Losing And Efficacy Expectations On Perceptions Of Own And Opponent Performance

	OWN PERFORMANCE		OPPONENT PERFORMANCE	
	MEAN	SD	MEAN	SD
WINNING	7.85	1.01	6.39	1.35
LOSING	4.34	1.58	8.34	0.68
LOW EFFICACY	6.00	2.14	7.67	1.16
HIGH EFFICACY	6.11	2.28	7.13	1.63

CHAPTER 5

DISCUSSION

Bandura (1977) has proposed self-efficacy as a common cognitive process mediating behavioral change. While several studies provide preliminary evidence to support the relationship between self-efficacy and performance, the present study was designed to examine the effect of efficacy expectations on an individual's perceptions of causality and subjective success in a competitive sport situation.

In utilizing an attributional framework to examine the relationship between self-efficacy and perceptions of causality, it is important to distinguish between absolute outcomes (winning/losing) and subjective outcomes (individual interpretations of outcomes) (Maehr & Nicholls, 1980). In order to understand an individual's perception of success and failure, Spink and Roberts (1980) have argued that it is necessary to employ, as a criterion for perceived success and failure, a measure of satisfaction. While success and failure are not necessarily synonymous with winning and losing, in the present study subjective perceptions of success and failure appeared to be based upon whether or not the subjects won or lost. The correlation coefficients between each of the subjective measures of success and failure and the absolute outcome based on winning or losing were all significant.

The failure of the present study to find a relationship between efficacy expectations and perceptions of success and failure may be reflected in the tendency of the individual to focus upon winning and losing rather than other competition-related information in the formation of success perceptions. The fact that subjects' subjective perceptions of success and failure did not differ from absolute outcomes reflects one limitation of research conducted in laboratory settings. Gill (1980) and Iso-Ahola and Roberts (1977) have argued that in studies conducted in laboratory settings, in which subjects participate in novel tasks and have little prior experience with either the task or the opponent, objective measures may become more salient in determining success and failure. In these instances, individuals may be processing the available information in an entirely logical manner when ascribing success to winning and failure to losing outcomes. Roberts and Duda (1984) suggested that in tasks and environments which require a great deal of experience, and for which the individual has adequate knowledge of their opponent's ability relative to their own ability, objective outcomes would be less important in determining success and failure.

Use of the Causal Dimension Scale (Russell, 1982) to examine the second hypothesis, concerning differences between winners' and losers' attributions, indicated winners made more stable and controllable attributions than losers.

Examination of the mean scores for the locus of causality dimension revealed no significant differences between the two groups, with both groups viewing their attributions as being internal. Further examination indicated that attributions were of an internal, unstable, and controllable nature for both winners and losers. These findings support previous research (Russell, 1982 ; McAuley & Gross, 1983), and may indicate that a self-serving bias is influencing the individual's perceptions of causality (Bradley, 1978). Because individuals had no prior experience on the task, the unstable attributions made for performance could possibly be interpreted as effort attributions. This is particularly interesting when considering the nonsignificant findings for the effects of efficacy expectations on individuals' perceptions of causality. The fact that efficacy expectations failed to emerge as significant mediators of the causal dimensions may be explained by the lack of ability (stable) attributions made for performance.

Both the Perceived Physical Ability Subscale and the task-specific measure of self-efficacy assess individuals' perceptions of ability, and it is unlikely that these measures would affect causal perceptions unless the individual had perceived ability as a major determinant of their performance. In field settings and with sports which require a great deal of ability in order to be successful, efficacy expectations may emerge as significant variables in the attribution process.

The only significant findings concerning efficacy expectations emerged in the effects of outcome and expectancies on perceptions of own and opponent performance. Individuals in the low efficacy expectation conditions rated their opponents' ability in the competition significantly higher than those in the high efficacy expectation group. There were no significant differences between groups as to their ratings of their own displayed ability. These findings are supported by previous research concerning the relationship between causal dimensions and perceived success, with the stability and control dimensions significantly influencing perceptions of success (McAuley , 1985).

The effect of efficacy information on perceptions of performance indicates that while ability attributions, conceived as being relatively stable over time, may be essential before efficacy information impacts upon an individual's perception of own performance, efficacy expectations and their effect on ratings of an opponent's ability are not similarly restricted. This conceptualization follows that of several investigators who have argued that ability attributions and the self-concept of ability (self-efficacy) play a central mediating role in achievement behavior (Bandura, 1977 ; Nicholls & Miller, in press).

The MANOVA for the effects of winning and losing on perceptions of own and opponent performance was significant, with differences emerging for both groups on the two dependent measures. Winners viewed their performance as being better than their opponent's performance, while losers viewed their opponent's performance as being better than their own performance. Unlike sport contests in which the criterion for success or failure is the ability to surpass a set standard or improve upon a previous best, in the present investigation the criterion for success or failure was simply whether or not the subjects beat their opponent. This may have caused the subjects to focus on winning and losing as the sole criterion for evaluating their levels of performance attainment.

Although sex differences were not hypothesized, analyses revealed a number of significant differences. The findings indicated that males rated themselves significantly higher on both the PPA and TSSE than did females. Differences also emerged in subjects' predictions of performance and their confidence in their predictions of success for the bicycle competition, with males again rating themselves significantly higher than females. The differences between males and females in their scores for the PPA and TSSE suggest that present measures of self-efficacy may tend to reflect and assess masculine qualities. For example, the Perceived Physical Ability Subscale utilized in this study assesses such attributes as strength, speed, and physical appearance. The task itself however, may have been the primary contributor to the differences between sexes in regard to subjects' predictions of performance and their confidence in those predictions. In a study by Corbin and Nix (1979) reported that females made lower predictions for ability to perform tasks perceived to be male-oriented than for tasks perceived to be female-oriented. Herkowitz (1978) suggested that tasks involving strength, speed, and power are male-oriented in nature and females generally do not make performance predictions as high as males for such activities.

The failure of self-efficacy to emerge as a significant mediator of the causal explanations given for performance suggests, at least in the present study, that efficacy expectations do not affect how an individual appraises certain cognitive information. However, the lack of ability attributions given by individuals for their performance, and the fact that present measures of self-efficacy are primarily based upon an individual's belief that they can display ability, offers a partial explanation for the orthogonality of efficacy expectations and causal ascriptions. Future studies in this area should be cognizant of this possible weakness in present measures of self-efficacy.

Bandura (1984) suggested that the structure of self-efficacy scales is dependent upon the domain of functioning and the specificity with which it is being examined. One important factor which needs to be considered in future studies is the type of task employed. The present task, which did not require a high level of ability, perhaps contributed to the lack of ability attributions when assessed by the Causal Dimension Scale (Russell, 1982). One possible explanation for the lack of ability attributions (i.e., stable vs. unstable) emerged when attributional statements were analyzed. Sixty-three percent of the total attributions given for failure could be subsumed under the causal element of ability. The most prominent explanation given for failure was as many subjects put it, "not being in as good of shape as I used to be." This indicates, that although the subjects' perceptions of causality were relatively unstable (effort attributions), their actual causal attributional statements could be interpreted as ability-related, a supposedly stable element. Attributions made to the same outcome may vary because of different perceptions concerning the covariation of effort and ability as they affect outcomes in various settings. Weiner's (1979) model conceives ability as a stable element. However Roberts (1982), Rejeski and Lowe (1980), and Lochel (1983) have all suggested that ability may be perceived as being changeable. Weiner (1983) noted that a basic error in attributional research is that the cause given for performance is often categorized without considering the situation as perceived by the subject. Weiner (1983) has suggested that ability may be perceived as unstable if learning is expected to occur or different abilities are being utilized over time. Ability may be perceived as relatively unstable when it connotes skill or knowledge rather than aptitude. In this situation, some period of time between initial and subsequent performance is typically required to generate the expectancy that an increase in skill or knowledge will take place. Even in laboratory research, where intervening time is not generally part of the study, the perceived stability of ability depends upon the characteristics of the task and the perception that skill is perceived as below normal at the initial performance.

The major problem with much of the sport attribution research has been the unquestioned acceptance of Weiner's et. al. (1971) classification scheme. Perhaps what is needed is a reconceptualization of the present attribution framework to differentiate between specific ability or knowledge, which could be viewed as changeable, and general ability or aptitude which might be relatively unchanging over time. Future research should be cognizant of these suggestions by employing tasks which differentiate between general and specific ability.

While the present study found no support for the self-efficacy-attribution relationship, future investigations might consider the role of efficacy expectations at some other point in the causal process. According to Bandura (1977), the impact of performance information on efficacy expectations depends upon how this information is cognitively appraised. Assessing efficacy expectations post-causality would therefore seem a relevant area for future sport attributional research.

In summary, the results of this investigation add support to previous studies concerning the internal, controllable and unstable nature of attributions given for performance (Russell, 1982; McAuley & Gross, 1983). Findings also raise questions concerning the present classification scheme (Weiner, 1979) of causal attributions and indicate that, in accordance with previous research (Roberts, 1982; Rejeski & Lowe, 1980; Lochel, 1983), ability may be perceived as variable over time. It is important that continued research address these issues which promise to provide a more complete understanding of achievement behaviors.

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APPENDICES

APPENDIX A

PHYSICAL SELF-EFFICACY SCALE

Instructions: Answer each of the following questions using the following scale. (1) strongly disagree (2) disagree (3) moderately disagree (4) moderately agree (5) agree (6) strongly agree.

---

1. I have excellent reflexes. (1)
2. I am not agile and graceful. (1)
3. I am rarely embarrassed by my voice. (2)
4. My physique is rather strong. (1)
5. Sometimes I don't hold up well under stress. (2)
6. I can't run fast. (1)
7. I have physical defects that sometimes bother me. (2)
8. I don't feel in control when I take tests involving physical dexterity. (1)
9. I am never intimidated by the thought of a sexual encounter. (2)
10. People think negative things about me because of my posture. (2)
11. I am not hesitant about disagreeing with people bigger than myself. (2)
12. I have poor muscle tone. (1)
13. I take little pride in my ability in sports. (1)
14. Athletic people usually do not receive more attention

than me. (2)

15. I am sometimes envious of those better looking than myself. (2)
16. Sometimes my laugh embarrasses me. (2)
17. I am not concerned with the impression my physique makes on others. (2)
18. Sometimes I feel uncomfortable shaking hands because my hands are always clammy. (2)
19. My speed has helped me out of some tight spots. (1)
20. I find that I am not accident prone. (2)
21. I have a strong grip. (1)
22. Because of my agility, I have been able to do things which many others could not do. (1)

Note: Items 2,5,6,7,8,10,12,13,15,16, and 18 scores are reversed. Numbers in parentheses indicate Factor 1 (Perceived Physical Ability) or Factor 2 (Physical Self-Presentation Confidence) items.

APPENDIX B

PERCEIVED PHYSICAL ABILITY SUBSCALE

Instructions: Answer each of the following questions using the following scale. (1) strongly disagree (2) disagree (3) moderately disagree (4) moderately agree (5) agree (6) strongly agree.

---

1. I have excellent reflexes.
2. I am not agile and graceful.
3. My physique is rather strong.
4. I can't run fast.
5. I don't feel in control when I take tests involving physical dexterity.
6. I have poor muscle tone.
7. I take little pride in my ability in sports.
8. My speed has helped me out of some tight spots.
9. I have a strong grip.
10. Because of my agility, I have been able to do things which many others could not do.

Note: Items 2,4,5,6,and 7 scores are reversed.

APPENDIX C

SPORT SPECIFIC SELF-EFFICACY

Instructions: Answer each of the following questions using the following scale. (1) strongly disagree (2) disagree (3) moderately disagree (4) moderately agree (5) agree (6) strongly agree.

---

1. I can peddle quickly.
2. I can peddle for extended periods of time without tiring.
3. I cannot peddle up steep inclines without stopping.
4. I can generate explosive power with my legs.

Note: Item 3 score is reversed.

APPENDIX D

PRECOMPETITION QUESTIONNAIRE

---

1. Do you think you will beat your opponent in the upcoming competition ? yes_____ no______

Instructions: Answer each of the following questions by circling the appropriate number.

---

2. How confident are you that you will beat your opponent ?

   not at all 1 2 3 4 5 6 7 8 9 very much so

3. How well do you expect to perform on the bicycle task ?

   not at all well 1 2 3 4 5 6 7 8 9 very well

4. How important is it for you to win this competition ?

   not at all 1 2 3 4 5 6 7 8 9 very important

5. How important is it for you to perform well ?

   not at all 1 2 3 4 5 6 7 8 9 very important

APPENDIX E

POSTCOMPETITION QUESTIONNAIRE

Instructions: Answer each of the following questions by circling the appropriate number.

1. Are you happy with your performance on the bicycle ?

   not at all 1 2 3 4 5 6 7 8 9 very happy

2. How would you rate your opponents performance ?

   very poor 1 2 3 4 5 6 7 8 9 very good

3. How well do you think you performed on the bicycle ?

   very poor 1 2 3 4 5 6 7 8 9 very well

4. Did you win or lose in this competition

   win_____ lose_____

APPENDIX F

CAUSAL DIMENSION SCALE

Instructions: Think about the reason or reasons you have written above. The items below concern your impressions or opinions of this cause or causes of your outcome. Circle one number for each of the following questions.

---

1. Is the cause(s) something that:

   Reflects an aspect of yourself 9 8 7 6 5 4 3 2 1 Reflects an aspect of the situation

2. Is the cause(s):

   Controllable by you or other people 9 8 7 6 5 4 3 2 1 Uncontrollable by you or other people

3. Is the cause(s) something that:

   Is permanent 9 8 7 6 5 4 3 2 1 Is temporary

4. Is the cause(s) something:

   Intended by you or other people 9 8 7 6 5 4 3 2 1 Unintended by you or other people

5. Is the cause(s) something that is:

   Outside of you 9 8 7 6 5 4 3 2 1 Inside of you

6. Is the cause(s) something that is:

   Variable over time 9 8 7 6 5 4 3 2 1 Stable over time

7. Is the cause(s):

   Something about you 9 8 7 6 5 4 3 2 1 Something about others

8. Is the cause(s) something that is:

Changeable	9 8 7 6 5 4 3 2 1	Unchanging

9. Is the cause(s) something for which:

No one is responsible	9 8 7 6 5 4 3 2 1	Someone is responsible

Note: A total score for each of the three subscales is arrived at by summing the responses to the individual items as follows: (1) locus of causality--Items 1,5, and 7; (2) stability--Items 3,6, and 8; (3) controllability--Items 2,4, and 9. High scores on these subscales indicate that the cause is perceived as internal, stable, and controllable. Scores for items 5,6,8, and 9, are reversed.

APPENDIX G

DEBRIEFING

Following each testing procedure, the subjects will be debriefed in the following manner:

1) Subjects will be notified that their scores were manipulated and be shown how this was accomplished. In addition, they will receive an explanation as to why this manipulation was necessary to accurately measure their actual perceptions of success and failure.

> In order for us to accurately assess how you felt about losing (winning), we had to make sure that you felt that you were losing (winning) in the bicycle competition. The scores you saw on the scoreboard were not your actual scores. We were able to adjust your score so that no matter how hard you peddled, your score would always be lower (higher) than your opponent's score. Watch this..If we peddle both of the bicycles at the same rate, you can see that your score increases much slower (faster) than the score of your opponent's bicycle.

2) After the subject has been debriefed regarding the manipulation of scores, the researcher will determine how the subject feels about the deception.

> Now that you know that even though the scoreboard indicated you lost (won), you might have actually won (lost), how do you feel about this? Does it bother you that your actual scores were not registered by the scoreboard?

3) If the subject exhibits signs of, or verbally acknowledges a problem with the manipulation, the researcher will explain that the subject was not the only one who was

involved in the study and who was placed in this situation. The researcher will then express thanks for the fine assistance the individual has given in the experiment.

4) The researcher will offer to answer any questions, and

5) The subjects will be asked not to discuss the nature of the study with others until all testing is complete.

APPENDIX H

INFORMED CONSENT

The purpose of this study is to examine an individual's reactions concerning interpersonal competition.

You will be asked to compete against an opponent on a bicycle ergometer for three trials. Each trial will be fifteen seconds, at an intensity of 3.5 kiloponds, with a thirty second rest between each trial. You will also be asked to complete several questionnaires concerning your feeling about the competition. These questionnaires will be given prior to and immediately following the competition.

It is highly unlikely that you will experience any discomfort during the trials other than slight fatigue or increased respiration. If you do feel any type of discomfort, pain, nausea, dizziness or difficulty in breathing, please let the experimenter know so that the trial can be stopped.

Your questionnaire and results will be given a code number and the results will be processed using these code numbers to insure your anonymity in the study. Information gathered during the study will not be released to anyone other than the investigators. At any point during the testing session you are free to withdraw from the study without penalty. Should you have any questions at any time, do not hesitate to ask.

The results of this research will be made available to you if you so desire.

I have read the above statements and understand the procedures that are being used in the study, and voluntarily consent to be a participant.

Signature:________________________

Date:________________________

Sex: M / F

Age:_______

Note: Each study dealing with human subjects must have prior approval from the Committee for Rights and Welfare of Human Subjects. Research involving intentional deception with human participants is expected to follow the American Psychological Associations guidelines on the conduct of such research (APA, 1982). For a review of the present status of these guidelines concerning intentional deception see Baumrind, 1985. Permission was obtained from the Human Subjects Committee to secure only a partial informed consent from each participant, which did not disclose the manipulation involved.

APPENDIX I

RAW DATA

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DATA MASTERS;
ID 1-2 CON 3 SEX 4 AGE 5-6 PS1 7 PS2 8 PS3 9 PS4 10 PS5 11
PS6 12 PS7 13 PS8 14 PS9 15 PS10 16 TS1 17 TS2 18 TS3 19 TS4
20 MANIP 21 CONPR 22 EXP 23 IMPWN 24 IMPER 25 SATIS 26 OPPER
27 OWNPER 28 LOC1 29 CON1 30 PCON1 31 STA1 32 PCON2 33 CON2
34 ECON1 35 ECON2 36 LOC2 37 ECON3 38 STA2 39 ECON4 40 LOC3
41 PCON3 42 STA3 43 CON3 44 ECON5 45 PCON4 46 WNLS 47 TRIALS
48 FTRIAL 49 FPERF 50;
LOCUS=LOC1+ABS(LOC2-10)+LOC3;
STABIL= STA1+ABS(STA2-10)+ABS(STA3-10);
CONTROL=CON1+CON2+ABS(CON3-10);
EXTCONT=ECON1+ABS(ECON2-10)+ECON3+ABS(ECON4-10)+ABS(ECON5-10);
PERCONT=ABS(PCON1-10)+ABS(PCON2-10)+ABS(PCON3-10)+ABS(PCON4-
10)+
CON1;
PPA=PS1+ABS(PS2-7)+PS3+ABS(PS4-7)+ABS(PS5-7)+ABS(PS6-7)
+ABS(PS7-7)+PS8+PS9+PS10;
TSSE=TS1+TS2+ABS(TS3-7)+TS4;
CARDS;
01211822135525252231234481848923258423786572432004
02111943553326455345177179696912199119519191111229
03421824455224244423234179798845265523495273511219
04321933254634224333155572727822315552558382532017
05121841561125554535188899897723288228646463621228
07311952521214644445188771811191911911999999992028
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11111842323315444444156378595743264457647282421228
12212051521114564426177575945555465767735573382014
13311942433323534424166555757933331821889392222006
14221843332424554443156565877633365538757375522016
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21111862333315345445178899895434784637867394431228
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23321942442412354242177672827913132922788292912115
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35411834453342533422225347788219383628457332531227
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41411961622216655436178888789919191912199191911229
42311962512116565425187793948333355533872693722016
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91211862645116465426256356965542151826585298992005
92111952362215355514178677788813382817798373931227
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94211952532215554522177995958912111911599199912017
95321941322215454433167695768272822822289863752015

9641185242222544442415637878782658643737837436l227
97221952422222555453415546493564334775483738353 2017
98122744432235444232174676466822282822888192811227

APPENDIX J

SUBJECT INSTRUCTIONS

The following directions were given during each testing session:

> As subjects, you will be required to participate in a cycling task in which the object is to pedal as fast as you can. Trials will be 15 seconds in length, with 30 second rest periods in between each of the trials. The actual competition involves the best two of three trials, so once either of you has won two trials the cycling part of the study will have been completed. The bicycle ergometers are hooked up to these electronic scoreboards, and the scores registered reflect how fast you are peddling. The timer will be set at 15 seconds, and will count down to zero. The signal to start the trial will be ready, set, and go. While the scoreboard is counting down, the faster you peddle the higher your score will be. Once the clock reaches zero your score will automatically stop accumulating. You should then lift your feet up from the pedals and rest them on the bar at the front of the bike. Do you have any questions ? If not, before we start I need you to fill out a short questionnaire.

After completing the questionnaires, the following instructions were given.

> Before we start the testing session, I want to run through a practice session so you understand how the competition works and get a feel for the bicycles. Both cycles are identical and the workloads are both set at 350 kpm. To insure that there are no systematic differences between them, I will flip a coin to decide which cycle you will be using. You may both adjust your cycle while I reset the clock and ready the scoreboard. The timer will be set at 15 seconds, and will count down to zero. The signal to start the trial will be ready, set, and go. While the scoreboard is counting down, the faster you peddle the higher your score will be. Once the clock reaches zero, your score will automatically stop accumulating. You should then lift your feet up from the pedals and rest them on the bar at the front of the bike. Do you have any questions ? If not, lets get ready for the first practice trial.

Similar instructions were given prior to the actual competition.

THE EFFECT OF EFFICACY EXPECTATIONS ON

PERCEPTIONS OF CAUSALITY IN MOTOR PERFORMANCE

by

TERRY ELLSWORTH DUNCAN

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements of the degree

MASTER OF SCIENCE

Department of Physical Education, Dance, and

Leisure studies

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1986

Bandura (1977) has proposed self-efficacy as a common cognitive mechanism which accounts for the effects of various psychological processes on performance. Although recent studies have provided preliminary evidence for the relationship between self-efficacy and subsequent performance on competitive motor tasks, little has been done to examine the relationship between self-efficacy and the cognitive appraisal of competitive sport information. The purpose of this study was to determine if a relationship exists between personal self-efficacy and the causal explanations given for performance in a competitive sport setting. Male and female undergraduate students (N=84) completed self-efficacy measures assessing their personal physical self-efficacy, and were assigned to either a high or low expectancy group in which efficacy expectations were manipulated on a bicycle ergometer task. Following competition, causal explanations given for performance were assessed using the Causal Dimension Scale (Russell,1982). Univariate analyses revealed that winners' attributions were more stable and controllable than those of losers but attributions were of an internal, unstable, and controllable nature for both winners and losers. Further analyses indicated that efficacy expectations were not significantly related to the causal explanations given for performance. Reliable sex differences were observed with males rating themselves significantly higher on the measures of self-

efficacy and on their efficacy expectations concerning subsequent performance on the bicycle. Results are discussed in terms of the limitations of present self-efficacy measures in assessing physical self-efficacy in competitive situations, and the possible influence of the task and task sex-typing on efficacy expectations.