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THE EFFECTS OF PSYCHOLOGICAL SKILLS TRAINING ON THE COGNITIONS AND PERFORMANCE OF HIGH SCHOOL SOFTBALL PLAYERS

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ABSTRACT

THE EFFECTS OF PSYCHOLOGICAL SKILLS TRAINING ON THE COGNITIONS AND PERFORMANCE OF HIGH SCHOOL SOFTBALL PLAYERS

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The purpose of this study was to investigate the effects of a psychological skills training (PST) program, under the direction of a coach, on the cognitions and performance of high school softball players. Self-confidence, competitive anxiety, and offensive performance were measured (with the SSCI the CSAI-2 and season offensive statistics) and compared between an experimental team and a control team throughout an entire softball season. Participants included 28 female softball players (Experimental team, $N = 12$; Control team, $N = 16$), grades 10 to 12 (Experimental team, $M = 10.83$; Control team $M = 11.51$). The experimental team began PST in the pre-season and continued throughout the entire season while the control team proceeded with their season as usual. Group means and standard deviations were calculated and compared using a multivariate analysis of variance (MANOVA). A positive effect of PST for the experimental team as compared to the control team resulted. Although the control team was an older, more experienced team, the experimental team reported higher levels of self-confidence, lower levels of anxiety and finished the season with better offensive performance statistics than the control team. It was concluded that athletes of high school age and ability will benefit from PST and that a coach can effectively teach PST.

DEDICATION

To my parents who taught us to always finish what we start.

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CHAPTER I

INTRODUCTION

Many coaches will argue that once athletes reach the "automatic" phase of learning the difference between success and failure becomes “mental.” This mental aspect of sport performance can be defined in terms of mental or psychological skills. It is believed that many successful athletes acquire psychological skills through a trial and error process rather than through formal instruction by coaches. A lack of formal instruction exists for several reasons. First, many coaches believe psychological skills, to a certain extent are innate. Second, coaches lack the knowledge to teach these skills (Martens, 1987). Furthermore, many coaches believe that psychological skills training is for elite athletes only (Weinberg & Gould, 1999). However, Weinberg and Williams (2001) state that, "If beginning athletes are taught to set realistic goals, increase self-confidence, visualize success, and react constructively, we can expect their performance and personal development to progress faster than the performance and personal development of athletes who do not receive similar mental training" (p. 349). Also, it could be argued that the use of psychological skills should result in a greater number of individuals having more positive experiences in sport. To date, however, very little research has been done to support these beliefs.

The systematic implementation of techniques and strategies used to teach or enhance the mental skills that “facilitate performance and a positive approach to sport competition” are described by the term psychological skills training or PST (Vealey, 1988a). The knowledge base for PST is derived, to a large extent, from research with elite athletes. Orlick and Partington (1988), for example, found “mental readiness” to be an extremely important factor influencing the performance of the most successful Canadian Olympians at the 1984 Olympic Games. An analysis of data obtained from 235 athletes revealed that the most successful athletes had mental plans, which enabled them to deal with distractions, overcome adversity and fully focus on the immediate task. In addition, these athletes set daily goals, practiced positive imagery and were high in self-confidence. Similarly, Gould, Eklund, and Jackson (1992) found successful athletes, as compared to less successful athletes, had better concentration, higher self-confidence, lower anxiety, and more task-oriented thoughts. In order to duplicate the positive attributes that seem to lead to such success, sport psychologists developed a variety of psychological intervention techniques.

Researchers have investigated the effects of individual intervention techniques as well as various combinations of techniques. Greenspan and Feltz (1989) reviewed 19 studies, covering 23 interventions and concluded that, in general, educationally based psychological interventions with individual athletes are effective in improving performance. In addition, Vealey (1994) reviewed intervention studies through 1992 and found 75% of those studies reported improved performance. Furthermore, Weinberg and Comar (1994) reviewed 45 studies and found 85% of those studies had positive performance effects. The fact that a greater percentage of more recent research has found positive performance effects as a result of psychological interventions has been attributed to a more in-depth, multi-modal, inclusive approach which combines different types of psychological skills, specifically, imagery, relaxation, self-talk, and goal-setting, into a packaged program (Weinberg & Gould, 1999; Weinberg & Williams, 2001). As an example of such research, Thelwell and Greenless (2001) evaluated an intervention package that included exactly those specified skills; goal-setting, relaxation, imagery and self-talk. The authors concluded that the package was effective for enhancing performance.

Vealey (1988a), however, suggested that multiple criteria should be focused upon in evaluation research of PST programs. She argued that although performance is an important criterion, other behaviors and cognitions should also be evaluated. For example, several researchers have shown that goal-setting training has been effective in reducing cognitive anxiety, and increasing perceptions of success and self-confidence (Burton 1989b, 1983; Miller & McAuley, 1987). Imagery training has shown similar results (Feltz & Reissinger, 1990). Reduced cognitive anxiety and increased perceptions of success, intuitively, should result in greater enjoyment of sport experiences. Therefore, Vealey concluded that "PST should be viewed as important for everyone involved in sport to help them maximize their abilities as well as their enjoyment and satisfaction from sport participation" (p. 332). However, more studies are needed across different skill levels, age groups, and special populations to further assess the benefits of mental training (Weinberg & Williams, 2001).

In addition, many questions remain as to the implementation of PST. Questions such as: When should PST be implemented in relation to the competitive season? When should PST practice take place in relation to physical skills practice? And, how much time should be spent on PST? Most importantly, however, who should conduct the PST program, a coach or a sport psychologist? There are benefits and drawbacks to both strategies. For instance, although a sport psychologist would be ideal, it is hardly practical to afford such a luxury at the youth or high school level! Also, it is less likely that the sport psychologist would be able to be with the athletes on a day to day basis. On the other hand, it has been argued that although coaches have daily access to athletes, athletes may be less likely to discuss problem areas or seek help from the coach in that the coach decides who plays. And then, of course, there is the issue of knowledge and experience differences between coaches and sport psychologists in regard to PST. To date, however, no researcher has evaluated the effects of a PST program that has been implemented by a coach. The present study is unique in that regard.

Sport psychology researchers agree that there is a need for more studies as many questions have yet to be answered, however, there are some common understandings. First, although some athletes are able to learn psychological skills on their own, a PST program is much more efficient than learning through trial and error (Martens, 1987). Second, an effective psychological intervention program should be individualized, it should use a variety of techniques, and it should be implemented systematically over time (Weinberg & Gould, 1999). Third, psychological skills training is much the same as physical skills training in that the desired psychological skills have to be practiced consistently (Martens, 1987; Weinberg & Gould, 1999). Martens (1987) emphasized that coaches and athletes must have realistic expectations from PST and realize that PST is not a "quick fix." It requires hard work equal to that of physical skills training. Finally, the skills learned in a PST program not only result in better participation in sport, but also in better participation in any achievement endeavor outside the athletic setting (Martens, 1987; Weinberg & Williams, 2001).

As more research is needed in the area of PST, the purpose of this study was to investigate the effects of a formal psychological skills training program on the cognitions and performances of high school softball players as compared to the cognitions and performances of high school softball players who did not receive a formal psychological skills training program. This study was significant in that it used multiple criterion measures to assess the effects of PST, with an intact interscholastic fastpitch softball team, across the entire season. In addition, the effects were compared with a team who did not receive PST, a team that was also assessed across the season. This comparison will help determine the significance of any differences from the beginning of the season to the end of the season. Furthermore, the PST program was developed and implemented by the head coach of the team, a unique factor in PST research. Finally, it was the intent of this study to help further the understanding of psychological skills in sport so that coaches can continue to improve on meeting the needs of their athletes. Most importantly, each athlete should have the opportunity to meet her/his fullest potential while keeping the "fun" aspect intact.

The psychological skills emphasized in this PST program were goal setting, relaxation, imagery, and self-talk. These four skills were chosen as they are viewed as "basic psychological skills" and "fundamental in the sense that they underlie many others" (Hardy, Jones, & Gould, 1996).

Overall, goal-setting has been shown to lower anxiety (Burton, 1983, 1989b), increase self-confidence (Burton, 1983; Miller & McAuley, 1987), and improve performance (Burton, 1983, 1989b; Kyllo & Landers, 1995). Furthermore, significant to this study, goal-setting is a skill where the accuracy of goals has been shown to improve with practice (Burton, 1983, 1989b).

As with goal-setting, relaxation, by itself and in combination with other skills, has been shown to positively effect cognitions and performance. Relaxation is a strategy that has been shown to reduce excessive muscle tension (Jacobson, 1938), and also, to reduce cognitive anxiety through attentional redirection (Nideffer, 1985). In addition, researchers have shown that relaxation has positively effected performance (Nideffer & Decker, 1970; Owen & Lanning, 1982) and has reduced state anxiety (Kukla, 1976; Lanning & Hisanaga, 1983). Also, as the perception of arousal is a source of efficacy information (Feltz, 1982), changing the symptoms of over-arousal through relaxation may enhance self-confidence.

Imagery also has been shown to be an effective strategy in enhancing cognitions and performance. Imagery has been related to higher levels of self-confidence (Vadocz, Hall, & Moritz, 1997), the regulation and control of arousal levels (Feltz & Landers, 1983), and improved performance (Feltz & Riessinger, 1990; VanGyn, Wengner, & Gaul, 1990). However, in a review of psychological interventions, Feltz and Greenspan (1989) concluded that a combination of relaxation and imagery was superior to relaxation or imagery alone. The PST program in this study used imagery in conjunction with relaxation.

Finally, self-talk was found to be related to anxiety (VanRaalte, Brewer, Rivera, & Petitpas, 1994), self-confidence (Landin & Hebert, 1999), and performance (Ming & Martin, 1996; Rushall, Hall, Roux, Sasseville, & Rushall, 1988). Negative self-talk can act as an attentional distracter to decrease performance, and subsequently, increase anxiety (Nideffer, 1976), whereas positive self-talk can help individuals stay appropriately focused (Weinberg & Gould, 1999) to enhance performance which in turn will increase self-confidence (Feltz, 1982). As with goal-setting, relaxation, imagery, and self-talk are skills that can be learned and improved with practice (Ming & Martin, 1996; Orlick & Partington, 1988; Williams & Harris, 2001).

Hypotheses

1. There will be no significant difference between the control team and the experimental team at the beginning of the season as measured by the State Sport Confidence Inventory (SSCI) or as measured by the Competitive State Anxiety Inventory - 2 (CSAI-2).

2. As measured by the SSCI, the experimental team will remain more constant across selected games in sport-confidence than the control team.

3. As measured by the SSCI, the experimental team will have significantly increased sport-confidence at the conclusion of the season as compared to the control team.

4. The experimental team will have significantly higher confidence and lower cognitive and somatic anxiety than the control team on all pre-game measures of the CSAI-2.

5. The experimental team will remain constant or increase confidence and report lower cognitive and somatic anxiety at the conclusion of the season significantly more than the control team as measured by the CSAI-2.

6. The experimental team will have significantly higher confidence and lower cognitive and somatic anxiety than the control team on all post-game measures of the CSAI-2.

7. The experimental team will have significantly higher on base averages and batting averages and will score more runs as compared to players on the control team.

Operational Definitions

1. *Psychological skills training program (PST)* - a systematic instructional program that includes training in goal setting, relaxation, imagery, and self-talk.

2. *Sport-confidence* - the belief or degree of certainty individuals possess about their

ability to be successful in sport (Vealey, 1986). Sport-confidence was measured by the State Sport Confidence Inventory (SSCI).

3. *Cognitive state anxiety* - the mental component of anxiety caused by negative expectations about success or by negative self-evaluation, both of which precipitate worry, and/or disturbing visual images (Martens, Burton, Vealey, Bump, & Smith, 1990). Cognitive state anxiety was measured by the CSAI-2.

4. *Somatic state anxiety* - the physiological and effective elements of the anxiety experience that develop directly from autonomic arousal (Martens et al., 1990). Somatic state anxiety was measured by the CSAI-2.

5. *Performance* - selected offensive game statistics included "on base average," "batting average," and total runs scored.

6. *Season* - the high school softball season included 6-7 weeks of pre-season and 8-10 weeks in-season (depending on state tournaments and rain days).

Limitations

The psychological skills training program to be evaluated was limited to female interscholastic fastpitch softball players (15-18 years of age). The measurements of independent psychological variables were subject to the limitations of paper-pencil tests. Among these limitations was the honesty and thoughtfulness of the participants in their responses. Also, performance statistics varied slightly, simply due to the interpretive differences of each team's scorekeeper. Although differences in games between teams were checked for agreement, other differences were not known. The effects of the PST program may have been influenced by coaching style and techniques of physical skills practice as this study is being done with the researcher's own team. The control team was an opposing team in the same conference. It was not known what psychological variables, if any, were practiced, it was only known that there was not a formal psychological skills training program. Also, the exact difference in ability between the experimental team and the control team was not known, however, it was assumed to be similar, as both teams were competitive at the varsity level.

CHAPTER II

REVIEW OF THE LITERATURE

When considering a psychological skills training program and the resultant effects, there are several factors to be considered. Factors such as arousal, anxiety, self-confidence, and their relationship to performance must be considered. In addition, individual psychological skill components and their relationship to arousal/anxiety, self-confidence, and performance also must be considered. Individual components of this psychological skills training program (PST) included; goal-setting, imagery, relaxation, and positive self-talk. Finally, although the effect of a psychological skills training program as a complete package has received little attention in sport psychology research, it is important to understand PST package research as it relates to arousal/anxiety, self-confidence, and performance. This review explored the research in each of these areas.

The Arousal Performance Relationship

"Peak performance," "optimal performance," "in the zone," are all phrases that have been used at one time or another to describe a situation where an athlete's performance has met or exceeded expectations. How does it happen? How does it NOT happen? Why do some athletes "come through" in pressure situations? Why do some athletes come through most of the time but not all of the time and why do other athletes rarely come through? Possible explanations for this phenomenon could lie in the literature on the arousal performance relationship. Several theories involving the arousal performance relationship were included in this review. First however, it is important to understand theoretical constructs of the arousal performance relationship.

Arousal is a motivational construct that describes the intensity level of behavior. Arousal varies along a continuum from deep sleep to high excitement. The higher levels of arousal, often referred to as anxiety, are those levels that produce feelings of discomfort and/or excessive concern and have been described as "...feelings of distress" (Lazarus & Averill, 1972), or "feelings of nervousness and tension" (Gould, Greenleaf, & Krane, 2002). Responses to anxiety can be divided into three separate yet interacting categories: cognitive, physiological, and behavioral (Brokovec, 1976).

Cognitive responses include worry, or apprehension, negative concerns about performance, and an inability to concentrate. Physiological responses include increased heart rate, increased muscle tension, shaking, sweating, and "butterflies." Behavioral responses may appear in the form of restlessness, performance decrements, and changes in communication patterns. Each response category is separate but interacting in that a response in one category may influence responses in other categories, yet, each may be separately influenced by different environmental conditions. Also, responses to anxiety differ among individuals. Thus, anxiety is viewed as a complex, multifaceted construct (Landers, 1980).

In addition, anxiety in sport is differentiated in terms of competitive trait anxiety and competitive state anxiety (Martens, 1977). According to Martens, competitive trait anxiety is a personality disposition acquired through experience, and is the tendency to perceive competitive situations as threatening (or dangerous) and to respond to these situations with feelings of apprehension and tension. On the other hand, competitive state anxiety, or A-State, are situation specific feelings of apprehension and tension that may change with time, feelings that are experienced at a particular moment.

Furthermore, competitive state anxiety is multidimensional in nature in that it has two subcomponents, cognitive anxiety and somatic anxiety. The multidimensional nature of competitive state anxiety has been continually supported through research (Burton, 1988; Caruso, Dzewaltowski, Gill, McElroy, 1990; Krane & Williams, 1987). It has also been theorized that cognitive and somatic anxiety change differently prior to and during performance evaluation (Gould, Petlichkoff, & Weinberg, 1984; Karteroliotis & Gill, 1987). In addition, cognitive and/or somatic responses to perceived threatening situations vary among individuals and situations (Krane & Williams, 1987). The complex, multidimensional nature of anxiety, in addition to the tendency of individuals to respond to anxiety differently, suggests that it is imperative to begin to understand each athlete and her/his response to various situations when designing a PST program.

Measurement of Competitive Anxiety. To further understand the complex constructs of competitive anxiety, Martens (1977) argued a need for sport specific measures. Theoretical advances of anxiety as a multidimensional construct lead to the development and validation of the CSAI-2. As stated in Martens, Vealey, and Burton (1990), the value in measuring cognitive and somatic A-state separately is based on the conceptual arguments and empirical evidence that these two anxiety components are elicited by different antecedents and that they influence behavior differently. The CSAI-2 separately measures the cognitive and somatic components of state anxiety. However, factor analysis of the initial scale unexpectedly revealed a third component, self-confidence. Therefore, in the 27 item CSAI-2, the 9 negatively worded items comprise the cognitive anxiety subscale and the 9 positively worded items, originally assumed to form a part of the cognitive anxiety subscale, comprise the self-confidence subscale. The remaining 9 items comprise the somatic anxiety subscale which represents perceived autonomic reactions versus actual physiological reactions (See Appendix C).

Reliability for the CSAI-2 was estimated by examining the internal consistency of the scale. Alpha coefficients for the cognitive subscale ranged from .79 to .83, for the somatic subscale from .82 to .83, and for the self-confidence subscale from .88 to .89. The authors concluded that this demonstrates "a sufficiently high degree of internal consistency for each of the CSAI-2 subscales" (Martens et al., 1990). The authors also found evidence to "firmly support" concurrent validity, and through a "systematic progression of research studies," found evidence to support construct validity. In addition, the many research studies by Martens and his colleagues have provided normative data for each of the three subscales. Norms by competitive level and gender are reported in Table 1. To date, the CSAI-2 remains the most commonly used multidimensional anxiety measure (Gould et al., 2002).

So far, discussion has included constructs of anxiety, and a means by which these constructs are measured. The question remains, what is the relation of all of this to performance? The following section is a review of the arousal performance relationship theory.

Inverted-U Hypothesis. The inverted-U hypothesis is a theory that has greatly assisted in the understanding of the arousal performance relationship. Also known as the Yerkes- Dodson Law (1908), it attempted to explain physiological responses to anxiety. The Inverted-U hypothesis proposes that as an individuals' arousal increases along a continuum from drowsiness to alertness there is a progressive increase in performance,

Table 1

Summary of Test Statistics for Norm Samples by Competitive Level and Gender (Martens et al., 1990)

		CSAI-cog		CSAI-som		CSAI-sc	
Sample	*N*	*M*	*SD*	*M*	*SD*	*M*	*SD*
High School							
Male	284	18.48	5.35	17.70	5.53	24.73	5.52
Female	309	21.61	6.47	18.92	5.97	22.50	5.51
College							
Male	158	17.88	4.84	17.68	4.86	25.37	5.15
Female	220	18.40	5.99	16.85	4.94	24.67	5.90
Elite							
Male	161	19.29	4.80	16.29	4.65	26.21	4.81
Female	102	20.11	5.42	17.98	5.20	24.56	5.33

when arousal increases beyond alertness to high excitement there is a progressive decrease in performance. Thus, there is a curvilinear relationship between the intensity of arousal and the effectiveness of performance. This curvilinear relationship infers an "optimal" level of arousal for "optimal performance."

However, there are mediating factors that exist in this arousal performance relationship. First, there is the effect of an individual's trait and state anxiety levels. Each individual's optimal level of arousal may be different and each situational peak may be different. From a practical perspective, this could be problematic in knowing if an individual's arousal level is too high or too low at any given time in any given situation. Second, the task complexity may alter this optimal peak. Oxendine (1970) suggests that high levels of arousal are best for optimal performance in speed, endurance, and strength tasks and at the other end of a continuum of sport skills, low arousal is best for optimal performance in activities requiring fine muscle control and cognitive judgment.

Early research generally has supported the inverted-U hypothesis for explaining physiological arousal and its relation to performance (Fenz & Epstein, 1967; Gould, Petlichkoff, & Weinberg, 1987; Martens & Landers, 1970). However, the hypothesis has come under some criticism, especially in that it fails to recognize the multidimensional nature of arousal. The inverted-U does not explain the role of cognitive anxiety. Out of dissatisfaction with the inverted-U hypothesis and other related anxiety theories, Hardy and Fazey (1987, cited in Hardy, 1996) proposed the cusp catastrophe model of anxiety and performance.

Cusp Catastrophe Model of Anxiety and Performance. Similar to the inverted-U hypothesis, the cusp catastrophe model predicts that an increase in arousal will facilitate performance up to an optimal level. However, the catastrophe model differs from the inverted-U hypothesis in that it predicts a dramatic decrease (rather than a progressive decrease) in performance when the athlete goes beyond that optimal level; a "catastrophe" from which it is difficult to recover, even to a moderate level of performance. The cusp catastrophe model also differs from the inverted-U hypothesis in that it attempts to describe the interactive effects of cognitive anxiety and physiological arousal on performance.

The cusp catastrophe model is a three dimensional model that includes cognitive anxiety and physiological arousal as independent variables and performance as a dependent variable. In essence, it predicts that performance is associated with increases in physiological arousal, however, the effects are moderated by cognitive anxiety. There are three important predictions of performance based on the interaction of cognitive anxiety and physiological arousal.

The first of these predictions is that high cognitive anxiety will lead to enhanced performance when physiological arousal is low but to impaired performance when physiological arousal is high. Second, cognitive anxiety will not always impair performance; it can sometimes enhance performance. However, under conditions of high cognitive anxiety, "the model predicts that performers' best performances should be significantly better, and their worst performances should be significantly worse" (Hardy, 1996, p. 148). And third, under conditions of high cognitive anxiety, "hystersis" occurs.

Hystersis is explained by the prediction that with high cognitive anxiety, the graph of performance in relation to physiological arousal will be different depending on whether physiological arousal is increasing or decreasing. More precisely, with high cognitive anxiety, performance drops at a higher level of physiological arousal when physiological arousal is increasing. Yet, when physiological arousal is decreasing, the level of physiological arousal must be lower for performance to return. Hystersis is not predicted to occur under conditions of low cognitive anxiety. Under conditions of low cognitive anxiety, physiological arousal should have relatively small effects on performance and reflect a normal inverted-U distribution.

Research support for the model at this point, although generally supportive, is limited (Hardy, Jones, & Gould, 1996) as the complexity of the model makes it difficult to test (Weinberg & Gould 1999). Furthermore, the studies that have been done have been criticized for inappropriate statistical tests and for the way researchers manipulated arousal (Landers & Arent, 2001). However, the cusp catastrophe model has some important implications for PST.

First, the cusp catastrophe model is unique in that it predicts that cognitive anxiety can sometimes be facilitative. Researchers have indeed found that cognitive anxiety can have both facilitative and debilitative effects. For example, Jones and Swain (1995) found no difference in the intensity of cognitive anxiety symptoms between elite and nonelite cricket players. However, the elite performers interpreted cognitive anxiety states as being more facilitative to performance than the nonelite performers. Also, in the nonelite group, cricketers who reported their anxiety as debilitative had higher cognitive anxiety levels than those who reported anxiety as facilitative. Overall, the key for the debilitative versus facilitative effect of cognitive anxiety appears to be the level of physiological arousal plus the interpretation of anxiety. Cognitive anxiety is more likely to be facilitative when physiological arousal is low and athletes interpret their symptoms as being beneficial to performance. This first prediction of the model suggests that relaxation plus positive self-talk would be important components of an effective PST program.

Second, the model predicts that if physiological arousal becomes too high, a cognitively anxious athlete will experience a sudden and dramatic drop in performance, thus, illustrating the fine line between optimal performance and disaster. Furthermore, once this drop occurs, it will take a great reduction in physiological arousal to regain previous performance levels. Hardy (1996) suggests that following a catastrophe, recovery may be more quickly achieved if both cognitive anxiety and physiological arousal are simultaneously reduced. The need for a simultaneous reduction would lend itself to multi-modal stress management strategies. In fact, Hardy recommends the athlete physically relax, cognitively restructure, then, once the previous performance level is regained, initiate a controlled reactivation. Being skilled in relaxation, positive self-talk, imagery, and even goal-setting would allow the athlete to accomplish these strategies.

To further add to the complexity of the catastrophe model, self-confidence also appears to play a role. As opposed to conventional theory where anxiety and self-confidence are viewed as at opposite ends of a continuum (Martens et al., 1990), researchers of the catastrophe model suggest that cognitive anxiety and self-confidence can be experienced at the same time. They also suggest that self-confidence will increase the probability that athletes experiencing cognitive anxiety can tolerate higher levels of physiological arousal before experiencing a decrease in performance. Furthermore, it has been suggested that "self-confidence may be one of the most powerful qualities that elite performers possess, certainly more powerful than anxiety or arousal management skills" (Hardy, Jones & Gould, 1996). Therefore, it is also important to understand self-confidence as it relates to performance.

Self-Confidence

As with competitive anxiety, self-confidence is a complex multifaceted construct with several theories that relate it to motivation and performance. Bandura (1977, 1986) proposed a situation-specific concept of self-confidence in his theory of "self-efficacy." Vealey (1986, 1988) theorized a sport-specific concept of self-confidence she termed "sport-confidence." This section is a review both of these theories as they relate to each other and to performance.

Self-Efficacy Theory. Self-efficacy as defined by Bandura (1977) is the belief or strength of conviction that one can successfully execute a behavior, carry out a task or produce a desired outcome given one's capabilities. In other words, self-efficacy is an individual's perception of performance potential given one's skills. Self-efficacy differs from self-confidence in that it is a situationally specific form of self-confidence. Self-confidence is typically viewed as a more global belief and is usually treated as a personality trait whereas self-efficacy is specific to a particular situation. According to self-efficacy theory, given the appropriate skills and adequate incentives, an individual's efficacy expectations will not only determine the choice of activities attempted, but the amount of effort expended toward the activity, and the persistence with which to complete the activity. In essence, self-efficacy will predict performance.

Self-efficacy theory continues on the basis of three dimensions of efficacy cognitions or expectations: level, strength, and generality. The level of self-efficacy refers to the individual's expected performance attainment and the number of tasks that can be performed where strength refers to the certainty with which an individual expects to successfully attain each level. Finally, generality refers to the number of domains one considers self-efficacious, or the ability of efficacy expectations to predict behavior in related tasks that require parallel skills. Also in the self-efficacy formula, are four principle sources of information that influence efficacy expectations: performance accomplishments, vicarious experience, verbal persuasion, and physiological arousal.

Performance accomplishment is an especially powerful source of information because it is based on personal experiences of success. However, just as previous successes will increase perceptions of abilities, previous failures will decrease perceptions of abilities. Performance accomplishments that are achieved on difficult tasks, tasks independently attempted, and tasks attempted early in learning with only occasional failures carry greater efficacy value than easy tasks, tasks accomplished with external aids, or tasks in which repeated failures are experienced early in the learning process (Feltz, 1984). Also, there is a predicted reciprocal relationship between performance accomplishments and self-efficacy. Previous experiences influence efficacy expectations and efficacy expectations influence future performances. Therefore, if previous experiences are perceived to be successful, efficacy expectations are increased and future performances are also likely to be successful, which will then further increase efficacy expectations. Thus, performance exposure which leads to success is the best method for instilling self-efficacy (Carron, 1984).

Although generally weaker, vicarious experience is also a source of efficacy information. The observation of another individual performing a threatening or difficult task can contribute to the expectation of success. Research shows vicarious experience most often occurs through modeling in which the model is live or filmed (Feltz, 1988; Gould & Weiss, 1981), or symbolic in the form of imagery (Feltz & Riessigner, 1990). Modeling is generally most effective when: 1) the observer has little or no experience with the task, 2) the observer has perceived similarities with the model, 3) multiple models are observed being successful with a task, 4) the models are seen overcoming obstacles, and/or 5) there is a clear outcome to the performance (i.e., not just the pitch but where it was caught in relation to the target). However, just as observing successful performances may increase efficacy expectations, observing unsuccessful performances may lower expectations (Bandura, 1986).

Verbal persuasion, also less powerful than performance accomplishments, includes persuasion by significant or nonsignificant others, persuasion by the performer in the form of self-talk, and/or persuasion by performance deception (convincing the individual that the task is easier that it looks). Gould, Hodge, Peterson, and Giannini (1989) showed that elite wrestling coaches ranked verbal persuasion 7th of 13 effective strategies used to enhance self-efficacy in athletes. In the same study, coaches ranked the use of positive self-talk, a form of verbal persuasion, 2nd (of 13), as they felt it was a "very effective strategy." Also important, the effectiveness of persuasion is influenced by the perceived credibility and trustworthiness of the persuader, and is only effective when the persuasive feedback is realistic. It should be noted, however, that the increase in efficacy expectations through persuasion would be temporary if the subsequent effort results in poor performance.

Finally, physiological arousal affects behavior through cognitive evaluation. An individual appraises the information conveyed by arousal and then makes judgments about her/his ability to perform. If an individual interprets the symptoms as anxiety or fear and the symptoms are perceived to be debilitative, performance will not be successful. Likewise, if the symptoms are interpreted as "readiness" to perform and are perceived to be facilitative, performance will be successful. The cognitive interpretation of arousal is an important key in determining efficacy expectations and, ultimately, performance. In support of this prediction, Feltz and Mungo (1983) found perceived physiological arousal to be a stronger predictor of self-efficacy than actual arousal. However, it was not found to be a predictor of performance.

Research by Feltz and Riessinger (1990) supported these four sources of self-efficacy as proposed by Bandura. Using a questionnaire, they categorized subject responses according to the four principal informational sources of self-efficacy. As predicted, performance accomplishments were shown to be the most significant source of confidence with 86% of the responses, physiological arousal followed with 9%, verbal persuasion with 8%, and finally, vicarious experience with 2% of the responses.

In addition to the components of Bandura's theory, proper incentives and necessary skills must be present for self-efficacy to be a major determinant of behavior. If an individual has the necessary skill and high self-efficacy but no incentive to perform, efficacy expectations will exceed actual performance. Also, causal attributions are significant in the relationship between self-efficacy and performance. Successes are more likely to enhance self-efficacy if performances are perceived as resulting from ability rather than from luck. Conversely, individuals can talk themselves out of succeeding by attributing failure to inherent ability rather than bad luck or reduced effort (Feltz, 1984).

Testing Bandura's Theory. Research by Feltz (1982), with female college students attempting a modified back dive, found self-efficacy to be a major predictor of performance just as Bandura's theory hypothesizes. However, self-efficacy was determined to be a major predictor of performance on the first trial only. After the first trial, performance on the previous trial was the major predictor on the next trial. As a result, Feltz suggested that the reciprocal relationship between performance and self-efficacy as proposed by Bandura, is not equal, as performance was found to be a stronger influence on self-efficacy than self-efficacy on performance. Feltz then proposed a respecified model to predict that both previous performance and self-efficacy would directly influence "approach/avoidance" performance on the back dive. Physiological arousal, although "neither a predictor nor an effect of self-efficacy," would be an additional influence on the initial trial.

Feltz and Mungo (1983) replicated this 1982 study to test the respecified model and found similar results. However, this study found that the perception of arousal was a stronger source of initial self-efficacy than past related experience but was not as strong as previous performance in predicting subsequent self-efficacy. Feltz (1988) looked at gender differences and found the respecified model to fit the data better for females than for males. Also, females showed a reciprocal relationship between self-efficacy and performance, yet males showed a reciprocal relationship between autonomic perception and heart rate. Previous performance and self-efficacy were found to be strong predictors of subsequent performance for both females and males. Results that were consistent over the three aforementioned studies are 1) the reciprocal relation between self-efficacy and performance, 2) that performance more strongly influenced self-efficacy than self-efficacy influenced performance, and 3) the first trial performance was the strongest predictor of subsequent performances.

George (1994) looked at testing Bandura's theory in an actual sport setting. Subjects were 53 male intercollegiate baseball players who completed self-report measures over a 9 game period during the baseball season. Results provided support for the reciprocal relationship between self-efficacy and performance and in agreement with Feltz (1982, 1988) and Feltz and Mungo (1983), in that the relationship existed but was not equal. Past performance was a stronger and more consistent influence on self-efficacy than self-efficacy on performance. In addition, moderate support was found for the prediction that self-efficacy is a determinant of effort. This finding is important in that it "addresses Bandura's (1977) assertion that self-efficacy influences effort, and other motivational behaviors such as choice of activities and persistence" (p. 395).

Bandura's theory, however, has been criticized in that it suggests that self-efficacy is a cause of performance, rather self-efficacy has been found to be an effect of performance. Also, although "found to be an important and necessary cognitive mechanism in explaining motor behavior," research findings show the theory model may be too simplistic to account for all behavioral change in motor performance (Feltz, 1984). In addition, self-efficacy studies rely on self-report measures that have been operationalized in many different ways for every different situation studied. An attempt to "parsimoniously operationalize self-efficacy in sport situations has proved low in predictive validity" (Vealey, 1986, p. 222). For this reason, Vealey (1986) offered a sport-specific conceptualization and measurement instrumentation in the name of sport-confidence.

Sport-Confidence. Sport-confidence as theorized by Vealey (1986), is a more general conceptualization of self-confidence than self-efficacy. Self-efficacy is situation specific, dealing with individual skills within the same sport and/or within a specific competition (i.e., an individual's self-efficacy may be greater for pitching than for hitting within a particular game of softball). In contrast, sport-confidence is more global dealing with overall performance expectancies in sport and/or specific competitions. Drawing from the literature on self-efficacy, perceived competence, and performance expectancy, Vealey proposed a model of sport-confidence where sport-confidence is defined as "the belief or degree of certainty individuals possess about their ability to be successful in sport" (p. 222). Within the model, sport-confidence is separated into two constructs, trait sport-confidence (SC-trait) and state sport-confidence (SC-state). SC-trait is a disposition construct defined as "the belief or degree of certainty individuals *usually* possess about their ability to be successful in sport." SC-state, on the other hand, is a "right now" construct defined as "the belief or degree of certainty individuals possess *at one particular moment* about their ability to be successful in sport" (p. 223).

As the perception of success is critical to the definitions of sport-confidence, a third construct of competitive orientation is included in the sport-confidence model. Based on the work of Maher and Nicholls (1980) that success means different things to different people, competitive orientation "was established to indicate a tendency for individuals to strive toward achieving a certain type of goal in sport" (p. 222). Because sport-confidence is based on perceptions of ability, Vealey proposes that competitive orientation "should reflect an athlete's belief that attainment of a certain type of goal demonstrates competence and success" (p. 222). Therefore, competitive orientation is based on two distinct types of goals: performance goals (i.e., performing well), and outcome goals (i.e., winning). It is theorized that although an individual usually strives to perform well and to win, the achievement of one goal may be a more important indicator of competence and success to the individual than the achievement of the other goal. It is further theorized that through successive sport experiences, individuals may become performance oriented or outcome oriented. Hardy, Jones, and Gould (1996) noted that Vealey's distinction between performance orientation and outcome orientation appears to be similar to Nicholl's (1980) earlier distinction between task orientation and ego orientation.

The sport-confidence model is an interactional model that takes into account an individual's competitive orientation and sport-confidence level and, thus, attempts to explain and predict behavior. Specifically, it proposes that SC-trait and competitive orientation interact with an objective sport situation to produce SC-state. SC-state is "predicted to be the most important mediator of behavior as it is based on the mutual influence of situational factors and individual differences" (Vealey, 1986, p. 224). The *perception* of behavioral responses then leads to subjective outcomes.

The subjective outcomes construct includes causal attributions, perceptions of success, and performance satisfaction, and is theorized to have a reciprocal relationship between sport-confidence, competitive orientation, and behavior. In other words, sport-confidence (trait and state) and competitive orientation (performance or outcome) both influence, and are influenced by subjective outcomes. Therefore, the model predicts that positive subjective outcomes are likely to enhance sport-confidence and, in turn, should increase an individual's degree of certainty that they can be successful in sport. Also, negative subjective outcomes are likely to undermine sport-confidence and, in turn, make an individual uncertain that they can be successful in sport. Reciprocally, individual differences in SC-trait and competitive orientation interact to influence perceptions of behavior that result in positive or negative subjective outcomes. For example, low SC-trait individuals may blame their failure on lack of ability even if other factors may have contributed to the negative outcome. Outcome oriented individuals may perceive themselves as successful only if they win, (even if they perform well) regardless of their actual performance (Vealey, 1986).

Measurement of Sport-Confidence. As stated earlier, the conceptualization of sport-confidence was motivated, in part, by a need for a much more parsimonious operationalization of self-confidence that would be able to predict behavior across a wide range of sport situations. Vealey's sport-confidence model indicated a need for the development of three instruments, one to measure trait sport-confidence, one to measure state sport-confidence, and another to measure competitive orientation. Efforts to do so resulted in the Trait Sport-Confidence Inventory (TSCI), the State Sport-Confidence Inventory (SSCI), and the Competitive Orientation Inventory (COI). Instrument refinement and reliability/validity were determined over the course of five phases within the study. For the purposes of this review, the SSCI will be the primary focus.

The initial version of the SSCI consisted of 19 items and used a 5-point likert scale that ranged from "extremely confident" to "not at all confident." Following phase 1 of the study, it was determined that the SSCI should be refined by reducing the number of items for the instrument to 13. Also, the scale was changed to a 9-point likert scale to "provide a broader range" and the labels of the scale were changed to "high," "medium," and "low" because they seemed "less reactive." In addition, a comparison to "the most confident athlete" known was added to anchor the top of the scale at a level which would be perceived to be very high. The purpose of the second phase of the study was to replicate the first phase using the modified version of the SSCI. All items of the SSCI were retained following phase 2.

Concurrent validity, or the effectiveness of a test to predict responses to related constructs, was determined in phase 4 as results showed all correlations to be significant in the predicted direction. Of particular interest, SC-trait was found to be an "effective predictor" of SC-state as measured by the SSCI as well as the CSAI-2. And, SC-state was found to be positively related to SC-trait and SC-state as measured by the CSAI-2. Also, a negative relationship was found between both SC-trait and SC-state, and cognitive and somatic competitive state anxiety (as suggested by Martens et al., 1990). In addition, COI-performance showed a significant positive relationship with SC-state as measured by the SSCI, and COI-outcome showed a significant negative relationship with SC-state as measured by the SSCI. According to Vealey, this suggests that "focusing on performing well is related to higher levels of SC-state, and focusing on winning and losing is related to lower levels of SC-state" (p. 230).

In phase 5, the validation process of the SSCI, SC-state was hypothesized to be a significant predictor of performance. To test this hypothesis, 48 elite gymnasts were administered the SSCI "1 1/2 hours prior" to a national meet and again "no later than 2 hours after the first round of competition." No significant correlation between performance and precompetitive SC-state was found. However, performance was significantly correlated with postcompetitive SC-state. These results support Feltz's (1982) finding that performance more strongly predicts self-confidence than self-confidence predicts performance and suggest that athletes quickly internalize feelings of competence and success based on their performance.

Also of interest, results from the testing of other related hypotheses were found to have significant correlations between SC-trait and postcompetitive SC-state and, postcompetitive SC-state was found to be positively related to performance orientation and negatively related to outcome orientation. Vealey believes the key finding of the study was that high SC-trait performance-oriented athletes were significantly higher in SC-state than all other groups suggesting "that the interaction of athletes' individual definitions of success with perception of their ability is related to their self-confidence when competing." Although additional research is needed to support these findings, evidence was accumulated for the SSCI as a valid operationalization of the construct of SC-state within the conceptual model (Vealey, 1988b).

Self-efficacy and sport-confidence theory provide several important implications in relation to PST. First, in that performance more strongly predicts self-confidence than self-confidence predicts performance, performance that leads to success is essential. In addition, the significance of performance success, combined with Vealey's (1986) finding that a focus on performing well is related to higher state sport-confidence, implicates goal-setting as an effective strategy for enhancing self-confidence. Second, the self-efficacy information sources of vicarious experience and verbal persuasion suggest that imagery and self-talk, respectively, may also be key strategies in enhancing self-confidence. Finally, the importance of the cognitive interpretation of physiological arousal suggests that relaxation skills would be valuable if arousal is perceived to be too high. Furthermore, a perception of arousal symptoms as facilitative may be more likely with training in positive self-talk.

In conclusion, if PST in goal-setting, relaxation, imagery, and positive self-talk can reduce the negative effects of anxiety and enhance the positive, "powerful" quality of self-confidence, then, not only will performance improve, but overall, the sport experience will be more enjoyable. Therefore, it is important to further understand the components of this PST program.

Psychological Skills Components

As previously reviewed, research indicates that both anxiety and self-confidence have an effect on sport performance. Some view anxiety and self-confidence as "opposite ends of a cognitive evaluation continuum," and suggested that cognitive state anxiety is the "lack of state self-confidence," or conversely, state self-confidence is the "absence of cognitive state anxiety" (Martens et al., 1990). Others view anxiety and self-confidence as orthogonal in that it is possible to experience both simultaneously (Hardy, 1996). Nonetheless, the psychological skills for the reduction of the negative effects of anxiety and the psychological skills for the enhancement of the positive effects of self-confidence are similar. For instance, in their chapter on "*Stress Management Strategies,*" Hardy, Jones, and Gould (1996) stated that "a number of psychological skills have been implicated by the literature.... However, it has been argued...that at least four of these are fundamental in the sense that they appear to underlie many others; these four are goal-setting, imagery, relaxation, and self-talk" (p. 162). At the same time, in their chapter on *"Strategies for Enhancing Self-Confidence,"* the same authors included goal-setting, imagery, self-talk and "some form of relaxation technique" (p. 64). These four skills were also the main focus of the psychological skills training in the present study and are therefore, the main focus of this review, beginning with goal-setting.

Goal-Setting

One explanation for the effect of anxiety on performance is that it acts to disrupt attention or concentration. Goal-setting is a strategy that is believed to reduce the effects of anxiety through attentional redirection. If individuals are focused on goals to be accomplished, they are less likely to be distracted by the "pressure" of the situation. Locke and Lathum (1985) suggest "at least two ways" for goal setting to facilitate performance under pressure; "first, setting goals in practice develops one's powers of concentration" in that practice is "always sharply focused," and "second, trying to achieve a goal in practice entails tension," after repeated experiences with tension, the individual learns to "deal with it effectively" (p. 215). At the same time, goal-setting can increase self-confidence. In relation to self-efficacy theory, as performance accomplishments are a principle source of efficacy information, the accomplishment of attainable goals is likely to enhance perceptions of self-efficacy. Furthermore, goal-setting provides an incentive for individuals to persist in their efforts until performance matches their internal standards (Feltz, 1984). Thus, goal-setting is viewed as a valuable strategy for the enhancement of cognitions and performance.

A goal is defined as an objective, a standard, an aim of some action, or level of performance proficiency (Weinberg & Gould, 1999). Goals can be subjective (i.e., having fun, trying hard), or they can be objective. Objective goals can be general, (i.e., improve offensive skills) or they can be specific (i.e., improve ability to hit an outside "strike" to the opposite field). Goals can be long term (i.e., by the end of the season) or they can be short term (i.e., by the end of practice). Types of goals include, outcome goals, performance goals, and process goals (Gould, 2001). Outcome goals generally focus on winning or doing better than an opponent, where performance goals focus on improvements relative to one's own past performance or, the achievement of performance objectives independent of opponents. Process goals focus on the execution of actions necessary to perform well.

Not all types of goals however, are believed to be equally effective. Goal-setting researchers in the motor performance arena typically have examined the relationship between types of goals and subsequent effects on cognitions and/or performance (Burton, 1983; Hall & Byrne, 1988; Miller & McAuley, 1987; Weinberg, Bruya, Garland, & Jackson, 1990). In a meta-analysis of 36 independent studies, Kyllo and Landers (1995) concluded, that overall, goal-setting improves performance in sport. Furthermore, performance improvement is greatest when moderate goals are set as opposed to goals that are too easy or too difficult. The authors also found that the trends of analysis suggest that "goal-setting may be improved by specifying goals in absolute terms," by setting "short term" as well as "long term goals," and by "allowing individuals to participate in setting goals" (p. 131).

Burton (1989a) evaluated the impact of "goal specificity and task complexity" on basketball skill development with undergraduate students. Results based on data from 20 subjects on six different basketball skills found subjects who set specific goals significantly out performed subjects who set general goals on two of the six skills while a third skill approached significance. Also, subjects who set specific goals performed significantly better than subjects who set general goals on low but not on high complexity tasks. The author cited several limitations such as the sample size, the ambiguity of task complexity, and failure to assess whether subjects who set general goals spontaneously set more specific goals. However, he concluded that the results support previous research that has demonstrated that "task complexity moderates goal effects" and that "goal effects have greater latency for complex than for simple tasks."

In relation to performance versus outcome goals, Burton (1983, 1989b) found performance goals to be more effective than outcome goals. In addition, research by Vealey (1986) showed evidence to suggest that "focusing on performing well is related to higher levels of SC-State (state sport-confidence) and focusing on winning and losing is related to lower levels of SC-State" (p. 230). Also, Vealey (1988a) found that elite athletes were more performance oriented than college and high school athletes. Relating to this finding, quantitative research by Orlick and Partington (1988) with Olympic (elite) athletes found that "the best athletes had clear daily (performance/process) goals." It is theorized that performance goals are more effective than outcome goals because they are based on aspects of competition that athletes can control even if other, uncontrollable circumstances do not allow them to win. Also, the "flexibility of performance goals allows athletes of all ability levels to raise or lower goals to keep them both challenging and realistic, ensuring both high motivation and consistent success" (Burton, 1989b, p. 107). Process goals are believed to be effective through the direction of attention to task-relevant cues (Gould, 2001). Recent research by Filby, Maynard, and Graydon (1999), however, showed that groups using multiple goal strategies (performance, process, and outcome goals) performed best. The authors suggest that outcome goals are most beneficial when combined with a "process orientation."

Researchers have also focused on the effects of goal-setting training. Burton (1983), for example, investigated a goal-setting training program with a collegiate men's and women's swim team. The purpose of his study was to determine if a goal setting training program would effectively teach athletes to set appropriate goals and if those athletes who set effective performance goals would have significantly better cognitions and performance than those who adopt outcome goals. Results for the female swimmers (as they more relate to this study), showed significant differences between the goal-setting training (GST) swimmers and the non-GST swimmers on expectancy accuracy (a goal-setting component), cognitive anxiety, and performance improvement. Results also showed a trend toward higher levels of self-confidence though there was no significant difference at the time of the post-tests. Other hypotheses proved to be non-testable due to lack of cooperation from the control group.

Burton (1989b) again looked at the impact of a goal-setting training program on "perceived ability, competitive cognitions, and performance" of collegiate swimmers. Also, he predicted that the accuracy of the goals of the GST swimmers would increase with training and practice. Goal-setting training involved teaching subjects to set specific rather than general goals, short-term rather than long-term goals and individual rather than team goals. Burton reported results for the female swimmers that supported three of four hypotheses in that " GST swimmers had more accurate expectancies, lower cognitive anxiety, and greater performance improvement than non-GST swimmers." And, although not statistically significant, there was a "strong trend" for support of the fourth hypothesis of self-confidence. Also, as predicted, GST swimmers demonstrated significantly more accurate goals than non-GST swimmers.

Goal-setting training was also the topic of investigation in Miller and McAuley's (1987) study. Their study, in which subjects were trained to set specific, positive, performance goals of appropriate difficulty, found that the group that had experienced "goal-training" had significantly higher perceptions of success and self-efficacy in basketball free-throw shooting than the "non-goal-training" group. No significant difference, however, was found in free-throw accuracy. The authors suggested a stabilizing effect of goal-setting as performance limits are reached.

In conclusion, researchers suggest that effective goal-setting can help lower anxiety, increase self-confidence and improve performance. Effective goal-setting includes setting moderately difficult performance/process goals that are measurable (Gould, 2001), and specific in "absolute terms." In addition, effectiveness is improved when short-term as well as long-term, and performance/process goals as well as outcome goals are set. Also, individual participation in the setting of goals along with goal training and practice may further enhance effectiveness. Finally, task complexity moderates goal effectiveness where the benefits of goals have a more direct impact on simple tasks than on complex tasks.

Relaxation

A second explanation for the negative effect of anxiety on performance is that of increased muscle tension. With an increase in anxiety, there may also be a simultaneous increase in muscle tension. As a result, antagonistic muscles work against agonistic muscles to inhibit movement efficiency. In relation to the "art of hitting," renowned Major League hitting instructor Charlie Lau (Lau & Glossbrenner, 1980) stated, "there is probably nothing that can destroy a batter's chances of hitting so quickly and so completely as tension" (p. 141). Relaxation is a strategy that works to reduce the negative effects of anxiety by reducing unnecessary muscle tension that may otherwise create coordination difficulties. Also, it is theorized that relaxation can aid in the reduction of anxiety created by worry or negative cognitions that are related to attentional disruptions. As suggested by Nideffer (1985), an athlete cannot simultaneously concentrate on instructions of relaxation and worry about competition. Also, as the perception of arousal is a source of efficacy information, changing symptoms of over-arousal (anxiety) through relaxation can enhance self-confidence.

Relaxation as identified by Jacobson (1929) is the direct negative of nervous excitement, the absence of nerve-muscle impulses. There are several modern techniques to achieve a state of relaxation, most of which stem from Jacobson's "progressive relaxation" (1938). Progressive relaxation involves the tensing and relaxing of major muscle groups, starting with one particular group and progressing, systematically, to other groups until all muscles are completely relaxed. Progressive relaxation works on three assumptions: 1) it is possible to learn the difference between tension and relaxation; 2) it is not possible to be relaxed and tense at the same time; and 3) decreased muscle tension will result in decreased mental tension (Weinberg & Gould, 1999). Other relaxation techniques, all of which work on these same assumptions, include differential relaxation, which entails an awareness of different levels of muscle tension (Rotella, 1985); a progressive relaxation variation, which involves learning to relax in 20-30 seconds (Ost, 1988); and passive progressive relaxation, which involves eventually learning to relax muscles without first tensing them (Williams & Harris, 2001). Whatever the technique, the goal is the same, to help individuals recognize unnecessary muscular tension and then learn to let go of that tension.

Although there has been little research on relaxation in sport (Hardy et al., 1996), the research that does exist has generally been supportive of relaxation as a strategy to enhance performance. For example, Owen and Lanning (1982), in their study on relaxation as a treatment method to enhance performance on a maze test concluded that relaxation can result in an "improvement in fine motor coordination in anxiety-laden situations." In addition, Nideffer and Decker (1970) reported a steady increase in shot putting performance with progressive relaxation as a treatment.

Along with improved performance, research also has shown a reduction in state anxiety. Research by Kukla (1976) used progressive relaxation with high school baseball players and found a reduction in state anxiety as well as improved batting performance under stressful conditions. Similarly, Lanning and Hisanaga (1983) found high school volleyball players who used progressive relaxation to have lowered state anxiety as well as improved serving performance.

In addition, relaxation has been found to be an important strategy with elite athletes. Heishman and Bunker (1989), in an investigation of mental preparation strategies of international elite female lacrosse players, found that "relaxation techniques were used by almost everyone in the study." Jones and Hardy (1990) conducted interviews with elite athletes and also found the use of relaxation to be an important strategy. Finally, Gould, Hodge, Peterson, and Giannini (1989) found anxiety reduction through relaxation training to be a strategy of elite coaches.

More researchers looked at the use of relaxation as one component of multicomponent treatment programs. In a 1989 review of psychological interventions, Greenspan and Feltz found eighteen of 23 interventions, or 78%, "were multicomponent and included relaxation in the treatment" (p. 230). Also, 67% of the interventions that included relaxation used progressive relaxation. The authors concluded that "educational relaxation-based interventions" are generally effective, however, studies showed that "various combinations of some type of relaxation plus imagery, or imagery and modeling," were superior to relaxation alone. Therefore, it is also important to understand imagery as it relates to cognitions and performance.

Imagery

Imagery has been defined as "a symbolic sensory experience that may occur in any sensory mode" (Hardy et al., 1996). In sport, imagery most often is employed in the form of mental practice. Mental practice is defined as "rehearsal of a physical task in the absence of observable movement" (Hecker & Kaczor, 1988). Mental practice, mental rehearsal, visualization, imagery, are terms that refer to "creating or recreating an experience in the mind" (Weinberg & Gould, 1999). Imagery is related to self-confidence in that individuals are able to "see" themselves demonstrating mastery. It is believed that this demonstrated mastery is not only a form of persuasion and/or a sense of performance accomplishment, but also a vicarious experience to the imager, all of which are theorized to be sources of information that influence self-efficacy. Imagery is also effective in optimizing arousal and attention for performance. Individuals "commonly use imagery to psych up or calm down to meet the energy demands of a particular sport, as well as to visualize aspects of the upcoming competition to sharpen the focus they need to be successful" (Vealey & Greenleaf, 2001, p. 254).

Imagery is a complex concept and researchers have looked at it through many different theories from many different aspects. In relation to the psychoneuromuscular theory, for example, Harris and Robinson (1986) measured EMG activity during imagery. Based on the results of the study, the authors concluded that muscular innervation is specific to the muscles necessary to execute the task and that innervation during imagery is not influenced by skill level. Jowdy and Harris (1990) also looked to determine if the magnitude of muscular activity with mental imagery was a function of motor skill level. Their study showed a significant increase in muscular activity during mental imagery with all subjects yet no significance based on skill level. Relative to the symbolic learning theory, Feltz and Landers (1983) in their meta-analysis of 60 research studies, found strong support for symbolic learning in that the effects of imagery on the performance of symbolic (cognitive) tasks were greater than the effects on the performance of motor or strength tasks. Imagery, therefore, has been shown to produce the greatest effects on tasks that are high in cognitive components.

Heckor and Kazor (1988) investigated imagery in sport as it relates to the bioinformational theory. Subjects' heart rates were recorded and imagery vividness was measured during the imagery of four different specified scenes. The subject pool consisted of 19 members of a Division I-AA NCAA softball team. The four scenes included a neutral scene (sitting in a lawn chair...), an action scene (lifting in a weight room), an athletic anxiety scene (approaching the batter's box in the final inning...), and a fear scene (hearing an explosion while cruising in a jet airplane). The authors reported that the "mean heart rates for the image periods were significantly higher during the action and athletic scenes as compared with the fear scene" (p. 369). Also, the images of the action and athletic scenes were rated "significantly more vivid" than for the neutral and the fear scenes. The authors concluded that some support was provided for the bioinformational theory as it applies to sport psychology in that "activation of response information (i.e., heart rate increases) occurred during imagery of scenes with which subjects had some familiarity and which involved physiological activation (i.e., action and athletic scenes) and imagery for these scenes was perceived to be more vivid by subjects" (p. 371). The authors also indicated that response information in the imagery script along with experience level is associated with "changes in measurable psychophysiological variables."

To further illustrate the complexity of imagery, Paivio (1985) suggested that different types of images may have different motivational and cognitive functions and may be associated with different outcomes. These functional differences are reflected in differences in imagery content. Based on this suggestion, Hall, Mack, Paivio, and Hausenblas (cited in Martin, Moritz, & Hall, 1999) created a model of mental imagery use in sport and within the model, identified and classified five types of imagery in terms of imagery content. The five types of imagery include, motivational specific (imaging the achievement of specific performance goals), motivational general-mastery (imaging focus and mastery in challenging situations), motivational general-arousal (imaging emotions and arousal necessary for competition), cognitive specific (imaging specific skill performance), and cognitive general (imaging performance strategies). These five types of imagery are related yet independent, that is, it is possible to use one type of imagery alone yet it is also possible to use two or more types of imagery simultaneously. The type of imagery used combined with the imagery ability (visual, kinesthetic) of the individual determines the outcome of imagery use. Resultant outcomes of the various types of imagery include motor skill acquisition, skill maintenance, performance of skills and strategies, arousal and anxiety regulation, and self-confidence (Murphy & Martin, 2002). The type(s) of imagery one chooses to use depends upon the goal(s) to be accomplished.

In relation to self-confidence, research by Feltz and Riessinger (1990) found a significant increase in self-efficacy after a brief exposure to mastery imagery. Similarly, research by Moritz, Hall, Martin, and Vadocz (1996) with elite rollerskaters, revealed that the high sport-confident skaters (as measured by the SSCI) used more motivational mastery and arousal imagery than the low sport-confident skaters used. Their finding suggests that "when it comes to sport-confidence, the imaged rehearsal of sport specific skills may not be as important as the imagery of sport related mastery experiences and arousal" (p. 177). Vadocz, Hall, and Moritz (1997) also found that athletes in their study who employed more mastery imagery had higher levels of self-confidence (as measured by the CSAI-2). In addition, arousal imagery was found to be a significant predictor of cognitive anxiety. Athletes who used more arousal imagery had higher levels of cognitive anxiety. In that competitive anxiety can be debilitative or facilitative, the authors suggest that if cognitive anxiety is a problem, engaging in arousal imagery will probably make the situation worse.

Also in relation to anxiety, Feltz and Landers (1983) suggest that imagery can be used as an "attentional-arousal set." That is, imagery can enable an individual to set appropriate pretension levels (to reduce tension when arousal is high or increase tension when arousal is low) and also help to direct and maintain attention on task relevant cues. Authors of present research suggests that athletes use motivational imagery the most, especially prior to competing, and they seem to use it to help control other variables important to performance such as competitive state anxiety and self-confidence (Vadocz et al., 1997). Therefore, if imagery can be used to increase self-confidence, control arousal levels, and focus attention, then it is logical that performance will also improve.

Several studies have linked imagery to improved performance. Feltz and Riessinger (1990) found that in addition to the increased self-efficacy, mastery imagery subjects also had significantly longer performance times on an endurance task than other subjects. Van Gyn, Wenger, and Gaul (1990) found that imagery combined with power training significantly improved cycle sprint performance better than the power training only group. The authors specified "skill imagery" (cognitive specific) as the type of imagery taught. Research by Wrisberg and Anshel (1989) with younger subjects (10-12 year old boys), although not specifically labeled, found that a combination of mastery, arousal and cognitive specific imagery along with a relaxation response technique was useful as a pre-shot strategy for enhancing basketball free throw shooting performance. Finally, Hall and Erffmeyer (1983) used visuo-motor behavioral rehearsal (VMBR) with highly skilled female basketball players. VMBR is a technique that combines visual imagery and relaxation. In a relaxed state, subjects viewed a videotaped model executing consecutive foul shots with perfect form then imagined making perfect foul shots themselves. Significant improvement was found in foul shooting performance.

In all, several factors are related to imagery effectiveness. As previously mentioned, the nature of the task is among these factors. Tasks that involve mostly cognitive components show the greatest effects of imagery. Effects can be achieved in motor and strength tasks, however, more time must be spent in mental practice for larger effects to be realized (Feltz & Landers, 1983). Another factor is the experience level of the individual. Although benefits have been shown for both beginning and slightly experienced individuals, they seem to be somewhat greater for the slightly experienced individuals (Feltz & Landers, 1983). A third, significant factor, is the imagery ability of the individual. Imagery ability is linked to the vividness and controllability of the image. The more vivid the image, the more senses and/or emotions used in creating the image (particularly kinesthetic and visual senses), the greater the effects of imagery. Equally important, controlling the image, making the image "do what the individual wants it to do," and being able to slow it down, speed it up, and/or visualize in the "real" time it takes to do it, is linked to greater effects. Imagery appears to be most effective when the image is clear, detailed, and controllable. In their extensive study with Olympic athletes, Orlick and Partington (1988) concluded that along with attentional focus, the "quality and control" of imagery was the "most important statistically significant athlete skill directly related to high level performance at the Olympic Games" (p. 129).

Also significant, imagery ability has been shown to improve with practice. Following interviews with elite athletes, Orlick and Partington (1988) concluded that the best athletes had "well developed imagery skills" which were perfected "through persistent daily practice." Vadocz et al. (1997) suggested that "athletes higher in imagery ability are more likely to use imagery, and using imagery subsequently strengthens imagery ability" (p. 251). Furthermore, imagery perspective may play a role in effectiveness. Although research is inconclusive, there is some evidence to suggest that internal imagery might have better results than external imagery (Weinberg & Gould, 1999). For example, Harris and Robinson (1986) found internal imagery to produce more EMG activity than external imagery. However, it is likely that the nature of the task and/or situation (training, competition) combined with individual differences mediates the selection of internal versus external imagery as many individuals with high imagery ability report switching between the two perspectives.

Finally, imagery has been shown to be an important strategy among elite athletes and coaches. For example, Heishman and Bunker (1989) found "visualization" to be the mental preparation strategy most frequently used by elite female lacrosse players. More specifically, 98% of the subjects reported using mental practice and 65% of the subjects considered mental practice to be as important or more important than physical practice. In addition, Gould et al. (1989) found imagery of performance success, although used less than other strategies, is a strategy used by elite coaches to enhance self-confidence. Furthermore, Orlick and Partington (1988) found "some 99%" of 235 Canadian Olympic athletes used mental imagery as a mental preparation strategy. Following individual interviews with 75 of the athletes, the authors concluded that the athletes "used imagery to get what they wanted out of training, to perfect skills within the training sessions, to make technical corrections, to imagine themselves being successful in competition, and to see themselves achieving their ultimate goal" (p. 112).

Self-Talk

Self-talk in sport is significant in that positive self-talk may act as a source of efficacy information to enhance self-confidence. It can also help individuals stay appropriately focused to enhance performance. Negative self-talk, however, may act as an attentional distractor to decrease performance and subsequently, increase anxiety. In essence, self-talk is the key to cognitive control (Zinsser, Bunker, & Williams 2001).

In general, self-talk is a difficult area to research. First, it has been argued that there is a lack of a precise definition and operationalization of self-talk (Hardy et al., 1996). Second, it is hard to measure an individuals' thought content during a practice or performance, and retrospective self-report measures may be altered by perceptions of performance (Feltz, 1992) and/or ability to accurately recall thought content (Brewer, VanRaalte, Linder, &VanRaalte, 1991). Third, in the end, is knowing if the type of self-talk (positive or negative) leads to performance (positive or negative) or if performance leads to the type of self-talk (VanRaalte, Brewer, Rivera, & Petitpas, 1994). Despite these inherent problems, research has shown some interesting results.

Rushall, Hall, Roux, Sasseville, and Rushall (1988) attempted to avoid some of these problems by controlling thought content. They investigated the effects of three specific thought content conditions on the skiing performance of eighteen elite Canadian skiers. The three thought content conditions included: 1) task-relevant statements, hypothesized to enhance mechanical efficiency; 2) mood words, intended to increase capabilities of performance; and 3) positive self-statements, intended to produce better physiological efficiency. Three experiments were conducted, one for each thought content condition, subjects played both experimental and control roles in all three experiments. Each subject determined the specific content of thought for each condition and practiced using it prior to the experimental session. Although the task-relevant condition was found to be most effective, results revealed performance improvements of more than 3% (greater than normally expected for elite performers) for all three thought content conditions, "even though all subjects reported that they were not aware of any performance differential." The authors concluded that these results support the contention that the content of thinking while skiing is a major determinant of the quality of performance.

Ming and Martin (1996) also looked to control thought content using a self-talk package that included the development of "key words" by four prenovice competitive skaters (11-13 year olds). Subjects planned, then memorized, key words to coincide with movements that were experienced on the ice. The authors concluded that the skaters did utilize the self-talk and that the self-talk package improved performance during practice. Also interesting, a self-report follow-up one-year later indicated that "the participants continued to utilize the self-talk during practices and that they believed that it enhanced their test and/or competitive performance. Along the same lines, Landin and Hebert (1999) used cue words with female collegiate tennis players to improve volleying skill. The self-talk (cue words) was shown to be effective in improving the performance of the two movement patterns on which the cue words focused. Also significant, subjects reported *increased self-confidence* following the intervention explaining that self-talk helped to direct attentional focus and prompt correct movement patterns.

Rather than using specified thought content, VanRaalte et al. (1994) used observation to analyze the audible self-talk and observable gestures of junior tennis players. Several interesting findings emerged from their study. Among them, positive self-talk was not associated with better performance; however, negative self-talk was associated with worse performance. Also, players who believed in the utility of self-talk won more points than those who reported that they did not believe. Furthermore, match losers were significantly more likely to lose a point following negative self-talk than match winners, which the authors believe, indicates a difference in response to negative self-talk. They suggested that the use of negative self-talk may be motivational to some players and may also reflect that player's perception of competence. Overall, the authors concluded that self-talk influences competitive sport performance.

In terms of controlling anxiety, Hardy, Gammage, and Hall (2001) found the uses of self-talk to be similar to that of imagery in that athletes reported using self-talk to psych themselves up, to relax, and to control arousal levels. In addition, Hardy et al.

(1996) observed that elite athletes appear to use self-talk in high pressure situations when there is potential for self-doubt to overpower self-confidence. The authors go on to state that the ability to "restructure cognitions from negative to positive in such situations is also likely to be a factor in distinguishing elite athletes from their less successful counterparts" (p. 70).

In all, negative self-talk has been found to be distracting and anxiety producing. It can foster self-doubt, it is usually irrational, it is critical and demeaning and in general, destructive. Positive self-talk, on the other hand, can be used to enhance performance, control anxiety, increase self-confidence, foster positive expectancies, provide self-reward, direct attention, sustain effort and acquire new skills. Common types of self-talk include, cognitive restructuring (working to change negative thoughts to positive thoughts), thought stopping (learning to recognize and "stop" negative thoughts), and the use of cue words (one or two words to specifically direct attention and/or trigger automatic reactions).

Heishman and Bunker (1989) found 98% of elite lacrosse players "used self-talk to maximize performance." Similarly, Orlick and Partington (1988) found the best athletes in their study of Canadian Olympians, had developed precompetition plans which included positive thoughts and reminders to focus on what had worked well in the past. These same athletes also maintained a constructive focus going into an event. Finally, Gould et al. (1989) found elite coaches encouraged the use of positive self-talk as it was viewed as a very effective strategy for improving confidence.

If each of the psychological skill components of goal-setting, relaxation, imagery, and self-talk have been shown to have positive effects on anxiety, self-confidence, and performance, then it seems logical that combining these skills into a packaged program will have even greater positive effects on anxiety, self-confidence, and performance. The following section is a review PST package research.

Psychological Skills Training Package Research

Early research into psychological skills training packages used a variety of combinations of various skills and measured subsequent changes in performance. For example, Seabourne, Weinberg, Jackson, and Suinn (1985) used a packaged intervention that included "seven different mental skills" and assessed the intervention effect on karate performance. Similar to the present study, the mental skills included relaxation training, mental rehearsal, and positive thought control. The remaining skills were stress management, self-regulation, concentration, and energy control (Suinn, 1983). The authors concluded that "the individualized and package intervention groups performed significantly better than all other groups (yoked, placebo control and control groups) on karate performance measures." In addition, they believed that having the subjects play an active role in the selection and practice of the mental skills contributed to the successful performances by enabling them to "gain a sense of responsibility and commitment to their cognitive training." In another study, Straub (1989) compared three different packaged programs in relation to dart throwing performance. The author found significant group differences in posttest dart throwing performance for all three packages but "in particular" for participants receiving the Bennett and Pravitz (1982) package. Interestingly, in addition to self-hypnosis, this package included goal-setting, relaxation, imagery, and affirmation statements (positive self-talk).

Much of the subsequent research has simplified PST packages to include three or more of the four basic skills of goal-setting, relaxation, imagery, and self-talk. Kendall, Hrycaiko, Martin, and Kendall (1990) looked at the effects of a relaxation, imagery rehearsal, and self-talk package on basketball game performance. The authors found an immediate intervention effect with all four intercollegiate basketball participants and concluded that the skills "were effective in enhancing the performance of a specific defensive skill in basketball game performance." Additionally, the participants had developed a positive attitude toward continued use of the intervention strategies. Wanlin, Hrycaiko, Martin, and Mahon (1997) assessed the effectiveness of a goal-setting package that, in addition to goal-setting, included positive self-talk, goal visualization, and self-evaluation. The experimental participants were three female speed skaters that demonstrated, as a result of the intervention, an increase in the drills and laps completed as well as a decrease in "off-task behavior." A fourth control participant did not demonstrate the same positive results.

Using a similar research design, Patrick and Hrycaiko (1998) found a PST package of goal-setting, relaxation, imagery and self-talk to enhance endurance performance. All three experimental participants showed an immediate enhanced performance effect following an introduction to the skills. In addition, there was a positive relationship between the "participants' level of mental skills usage and running performance." Furthermore, participants reported that using all of the skills in the package aided each single mental skill. The authors argued that the interrelatedness of the skills provides a more powerful intervention because the skills are used in combination. Further research by Thewell and Greenless (2001) provided support for the use of goal-setting, relaxation, imagery, and self-talk in a PST package in relation to endurance performance. All five "recreational" gymnasium triathlon participants experienced an immediate performance effect when introduced to the skills and all five participants demonstrated an increased usage of the mental skills throughout the intervention. The authors pointed out, however, that the performance measures were not taken in a competitive environment and suggest that "future research is required to demonstrate the benefits of psychological skills training on competitive athletic performance."

Fewer studies have looked at psychological skills training packages and subsequent effects on self-confidence and/or anxiety, in addition to performance. Hughes (1988), however, found a PST package of goal-setting and imagery (to be practiced "in a state of relaxed attention," Martens, 1987) to increase self-confidence as well as enhance the sport skills of male high school athletes. His investigation was unique in that an instructor at the secondary school level implemented the PST program. In a more recent study of mental skills training and novice scuba divers, Terry, Mayer, and Howe (1998) found the intervention group to show lower respiration rates and better performance than the control groups. In addition, particularly significant to scuba diving, as panic (extreme anxiety) may be fatal, the intervention group also reported higher self-confidence and lower cognitive anxiety. The mental skills training program included relaxation, mental practice, and "affirmations" (positive self-talk).

Hanton and Jones (1999b) used an intervention package of goal-setting, imagery, and positive self-talk/thinking with competitive swimmers who were "debilitated by anxiety." As for the exclusion of relaxation, the authors argued that because anxiety has been reported to be facilitative as well as debilitative (Jones & Swain, 1995), it may not be appropriate or possible to reduce the symptoms of anxiety, in certain sports, through relaxation techniques. It may be more appropriate to help athletes interpret anxiety symptoms as facilitative. Previous research (Hanton & Jones 1999a) showed goal-setting, imagery and self-talk to be a particularly important means of maintaining facilitative interpretations of anxiety and was, therefore, integral in the intervention package. Swimmers who completed the intervention reported more facilitative interpretations of anxiety. In addition, subjects showed a "considerable increase in confidence levels" as well as evident performance improvements across ten races. The authors concluded that the findings provide evidence that the intervention was successful when working with athletes in the "real world" of competitive sport.

In all, researchers have shown PST programs to result in improved performance (often immediate), increased responsibility and commitment on the athletes part, increased attentional focus, decreased off-task behavior, increased practice intensity, increased self-confidence, decreased anxiety, and directional changes in the interpretation of anxiety from debilitative to facilitative. In addition, intervention participants have reported "significantly greater pleasure and enjoyment" (Beauchamp, Halliwell, Fournier, & Koestner 1996). The sum of these positive attributes suggest that it is only logical to address the need of finding further answers in relation to PST and competitive sport.

CHAPTER III

METHODS

Participants

The participants were 43 female softball players belonging to Michigan Class A High School teams from three suburban communities. The experimental team competed in an eight-team league of all Class A schools including four inter-city schools. Most players came from middle socioeconomic families. The control teams were teams competing in the same conference and were chosen for similarities in community size and atmosphere (very supportive), team achievements, socioeconomic background, and conference experiences. The numbers on each team were as follows: Experimental, n = 12; Control #1, n = 16; Control #2, n = 15. Midway through the season, the coach of a control team decided to no longer participate in the study; therefore, the study concluded with one control team. Two players from the remaining control team quit midway through the season to reduce the total number of participants to 14. The following were the demographics of the experimental team and the remaining control team.

Along with the preseason measures, players of both the experimental team and the control team responded to a demographic information questionnaire (see Appendix A). The purpose of this questionnaire was to better understand the make-up of the two teams and differences between the two teams. The information gained through the demographic questionnaire is displayed in Table 2. Overall, the experimental team was a younger, less experienced team. The average grade for the experimental team was 10.83, SD = .72, while the average grade for the control team is 11.51, SD = .65. In terms of "senior leadership," the control team bettered the experimental team by seven seniors. As for the experience factor, the experimental team had less overall varsity sport experience (2.50 years/player versus 3.71 years/player), less varsity softball experience (1.58 years/player versus 1.86 years/player) and less summer softball experience (2.17 years/player versus 4.79 years/player). Although the differences in age and experience were not initially known when the control team was selected, they are important to keep in mind to fully understand the implications of the results of this study.

Table 2

Demographic Information

	Experimental Team	Control Team
Year in School	Sr. 2 Jr. 6 So. 4 *M* = 10.83 *SD,* .72	Sr. 9 Jr. 4 So. 1 *M* = 11.51 *SD,* .65
Seasons of Varsity Sport Experience	Total, 30 *M* = 2.5 2 players at 4 years	Total, 52 *M* = 3.71 8 players at 4 years+
Seasons of Varsity Softball Experience	Total, 19 *M* = 1.58, SD .70 1 at 3 years 5 at 2 years	Total, 26 *M* = 1.86, SD .86 4 at 3 years 4 at 2 years
Seasons of Summer Softball Experience	Total, 26 *M* = 2.17 3 at 4 years+ 2 at 7 years +	Total, 67 *M* = 4.79 8 at 4 years+ 6 at 7 years+

The experimental team's season consisted of 14 conference games, 13 non-conference games, and one state tournament district game for a total of 28 games. The control team's season consisted of 14 conference games (the same conference), 18 non-conference games, and one state tournament district game for a total of 33 games. The game-by-game outcomes for the season are listed in Table 3.

Table 3

Game by Game Summary of Runs Scored (RS) and Runs Against (RA)

	Experimental Team			Control Team		
Game	RS	RA	Difference	RS	RA	Difference
1	16	17	-1	12	0	+12
2	10	3	+7	9	11	-2
3	17	15	+2	1	10	-9
4	19	3	+16	14	6	+8
5	10	18	-8	14	4	+10
6	11	10	+1	13	10	+3
7	11	8	+3	3	4	-1
8	9	19	-10	1	11	-10
9	18	7	+11	3	2	+1
10	**15	7	+8	0	9	-9
11	**7	12	-5	12	11	+1
12	*7	5	+2	8	3	+5
13	*14	12	+2	0	3	-3
14	*9	7	+2	**7	15	-8
15	*10	9	+1	**12	7	+5
16	**10	0	+10	*12	6	+6
17	**11	10	+1	*6	5	+1
18	4	14	-10	*4	2	+2
19	***9	19	-10	*4	2	+2
20	*7	12	-5	*11	1	+10
21	*1	18	-17	*12	4	+8
22	*13	20	-7	5	4	+1
23	*15	9	+6	8	6	+2
24	13	22	-9	*4	6	-2
25	4	16	-12	*3	1	+2
26	*18	20	-2	7	14	-7
27	*16	4	+12	1	8	-7
28	1	6	-5	**9	4	+5
29				**22	0	+22
30				0	8	-8
31				*14	4	+10
32				*25	3	+22
33				***2	12	-10

*Conference games; **Measures taken; ***District game

The control team finished the season with a higher overall winning-percentage (20-13; 60.6%) than the experimental team (15-13; 53.5%), and finished ahead of the experimental team in the conference standings (11-3, 2nd place; 9-5, 3rd place, respectively). Also, an analysis of the outcome differences indicated that the control team did better than the experimental team defensively. The control team gave up 293 season (67 conference) runs compared to the experimental teams' 322 season (145 conference) runs. Subjective knowledge of the individual pitchers gave the control team a distinct edge in pitching ability and experience. This edge largely accounted for the difference in the "runs against" column.

The game of softball is structured such that the pitcher plays a central role in the teams defensive "success." For this reason, a more realistic indication of overall individual contributions may be gained through an offensive analysis (Table 4). Looking at outcome only, the "runs scored" totals show that the experimental team had the offensive advantage. The experimental team scored 305 season (153 conference) runs while the control team scored 259 season (146 conference) runs. Although it is not specifically indicated, it is interesting to note that the most runs given up in a single game by the control team (15) were to the experimental team.

The Michigan High School Athletic Association sponsored an annual State Tournament for which every member school was eligible. This tournament began toward the conclusion of the regular season with district then regional, quarterfinal, semifinal, and final competitions and was a single elimination format. Only one team per class (Class A) made it through the tournament without being eliminated and was thus declared State Champion. Although teams may have had a few games following the

Table 4

Offensive Team Totals for the Experimental and Control Teams

Experimental Team Totals		Control Team Totals	
Overall – 28 games:		Overall – 33 games:	
Runs Scored	305	Runs Scored	259
Runs Against	322	Runs Against	293
Average runs/game		Average runs/game	
Runs Scored	10.89	Runs Scored	7.85
Runs Against	11.50	Runs Against	8.88
Difference	-.61	Difference	-1.04
Conference – 14 games:		Conference – 14	
Runs Scored	153	Runs Scored	146
Runs Against	145	Runs Against	67
Average runs/game		Average runs/game	
Runs Scored	10.92	Runs Scored	10.43
Runs Against	10.35	Runs Against	4.79
Difference	+.57	Difference	+5.04

district game, a loss in a district game was commonly viewed as the "end" of the season. Success in the district tournament ultimately dictated the length of the season. The district game therefore, was a highly significant game for both the experimental team and the control team. Understanding this significance and viewing this game more closely is necessary to aid in the interpretation of results. The district game summaries are presented in Table 5.

By district draw, both teams were placed in the same bracket with the control team drawing a first round "bye." The first round bye for the control team along with a first round loss for the experimental team resulted in a common opponent for both teams. Although both teams lost by ten runs in six innings, the experimental team demonstrated greater offensive production with 9 runs and 12 hits compared to 2 runs and 5 hits for the

Table 5

District Game Summary for the Experimental and Control Teams, Score by Inning, Offensive Totals

	Experimental Team		Control Team
Score:	9-19	Score:	2-12
Inning:	1 2 3 4 5 6 7	Inning:	1 2 3 4 5 6 7
Team:	2 2 0 3 2 0 -	Team:	1 0 0 0 0 1 -
Opponent:	8 3 0 2 0 6 - game	Opponent:	4 0 1 4 0 3 - game
Team Totals			
	9 runs, 12 hits, 4 errors		2 runs, 5 hits, 15 errors
	5 BB (2 scored)		0 BB
Opponent Totals			
	19 runs, 9 hits, 1 error		12 runs, 11 hits, 6 errors
	16 BB (11 scored)		8 BB (4 scored)

control team. Both teams faced the same "All-District" pitcher for the opponents. The 16 walks given up to the opponent, 11 of which resulted in runs, was evidence of the inexperienced pitching staff of the experimental team. The experimental team also committed four errors. The same junior varsity player who replaced an injured varsity starter, however, committed three of those errors. The junior varsity player had not been a part of the experimental intervention. A varsity player committed the fourth error after moving from first base to shortstop following an injury to the shortstop. The 15 errors committed by the control team cannot be accounted for but it was apparent that this was not a typical defensive effort.

Instrumentation

Demographic Survey. Titled "background information," (see Appendix A) the demographic survey was a 5-item questionnaire used to determine initial differences among players on the experimental team and the control teams.

State Sport-Confidence Inventory (SSCI). The SSCI (see Appendix B) is a 13-item self-report inventory designed to measure self-confidence in specific sport situations. The inventory uses a 9-point Likert scale in which athletes are to rate items from low (1) to high (9) based on the "most confident" athlete they know. The SSCI has demonstrated adequate validity, positive contributions to alpha, item-total correlation coefficients greater than .50 and acceptable item discrimination coefficients. Internal consistency estimates resulted in an alpha coefficient of .95 (Vealey, 1986).

Competitive State Anxiety Inventory - 2 (CSAI-2). Within the 27-item scale of the CSAI-2 are three 9-item subscales that measure cognitive anxiety, somatic anxiety and self-confidence (see Appendix C). The CSAI-2 is a revised version of the original Competitive State Anxiety Inventory (Martens, Burton, Rivkin, & Simon, 1980) and was initially designed to separately measure the cognitive and somatic components of anxiety. Factor analysis of the initial scale, however, unexpectedly revealed a third component, self-confidence (Martens et al., 1990). Internal consistency was demonstrated with alpha reliability estimates for each of the three subscales exceeding .80 in three separate samples (Burton, 1983) and concurrent validity was established by supporting predicted relationships between the CSAI-2 and a variety of other trait anxiety measures (Gould, Petlichkoff, & Weinberg, 1984). Also, the authors found evidence to support construct validity through a "systematic progression of research studies" (Martens et al., 1990).

Performance Data. Two offensive statistics typically calculated for softball players, on-base average and batting average, were selected as indicators of performance. On-base average for each player was calculated by dividing the total number of times on base by the total number of times at bat. Batting average was calculated by dividing the total number of hits by the total number of official times at bat (all at-bats except walks, hit by a pitch, and catcher interference).

Procedures

Approval for this study was received from the University Committee on Research Involving Human Subjects (UCRIHS). See Appendix D. Control teams were selected on the basis of experiences similar to those of the experimental team, within their own respective communities, and within the same conference of play. Coaches (also friends and colleagues) of the teams were approached with the idea of participating in this study and both agreed. Prior to the administration of any instrumentation, players of all teams were asked to participate in the study and, thus, signed participant consent forms. The PST program was administered by the researcher and coach, a graduate student at a mid-western university, under the direction of an accomplished sport psychologist from the same university.

All measures were administered to the experimental team and the control teams prior to the season for pre-season measures (see Appendix E for season schedule). Following the completion of the pre-season measures, the coaches and players of the control teams were instructed to proceed with their normal preseason activities while the experimental team was introduced to Psychological Skills Training. All players of the experimental team participated in the PST as this was a scheduled part of the training for the team. The intensity of participation for each individual, however, could not be controlled. The first three days of practice were an adjustment period during which players learned the routine of practice and got to know each other better. The initial PST session for the experimental team occurred on the fourth day of practice and included detailed discussions on self-talk, social reinforcement, the attentional demands of softball, and goal-setting. Players were given goal-setting guides and competition reflection guides (Orlick, 1986; see Appendix F1& F2 respectively) that were to be completed for practice the next day. Players were asked to keep written evaluations for each pre-season practice from this day forward in terms of daily goals and psychological skills applied. The skills introduced in this practice were continually emphasized and reinforced as they came up in physical skills practice.

Session two took place four days later when relaxation and mental imagery were introduced. The session took place at the beginning of practice to help provide a more concentrated effort throughout practice. Prior to any discussion, players were instructed to read Chapter 6, Mental Rehearsal, of the *Athletes' Guide to Mental Training* (Nideffer, 1985). Imagery and relaxation were discussed, after which players participated in a relaxation/imagery session. In a relaxed state, players observed a skilled model demonstrate correct hitting mechanics then imaged themselves duplicating the action. Player attention was directed to several key elements of hitting mechanics.

Players were then asked to practice relaxation and imagery on an individual basis in addition to the team sessions. Suggested times for individual practice included at night when preparing to sleep, or prior to anxious situations such as test taking, speech giving, etc. Players were also asked to use relaxation and imagery on their own in team practices at times such as just prior to a turn in the batting cage, between defense repetitions, or while practicing pitching. Further team sessions were conducted approximately once a week throughout the season (see season schedule) and became progressively shorter in length as skill increased. Also, players were asked to evaluate their own progress in the development of their ability to relax and image.

A detailed discussion of the effects of anxiety on performance took place at the start of the third week of practice. Players were asked to look back through practice evaluations and develop their own individual pre-competition plan (Orlick, 1986; see Appendix F 3), according to what they felt would work best for them. Individual plans were continually evaluated and adjusted by each player, often with the help of the coach, throughout the season. In addition, once games began, players were asked to evaluate competitions using the competition evaluation form as a guide (Orlick, 1986; see Appendix F4). Continued psychological skills practice took place through the remainder of the season. The focus was on trying to make the skills automatic and, thus, available to the athlete when needed.

During competition, players were instructed to use the practiced positive self-talk, relaxation, and imagery skills to help recover more quickly from mistakes. In that softball is essentially a game of failure (i.e., a "good" hitter in high school softball still fails six of ten times), these skills have the potential to be called upon often. For example, following a swing and a miss, players were to: step out of the batter's box, briefly relax, then image the bat making contact with the center of the ball, on a pitch within the strike zone. With practice, this routine took only seconds! Also, communication between players was worded positively. "Don't worry about it" was not considered a positively worded statement! Players instead would give each other verbal cues (not instruction) on performance execution to prepare for the next play. For example, following a defensive error where the player looked to the base for the throw before securing the ball, one would say "head down," or "stay on it," both of which were understood by everyone on the team.

As the season progressed and situations came up, various additions were made to practices. For example, following the experimental team's second game loss to a control team, most players talked about being distracted by verbalizations from a "fan." They agreed that as anxiety increased over what was being said, they were unable to regain the necessary attentional focus. The next day's practice included a position play drill with nine players on defense. The remaining players plus the assistant coach were instructed to "laugh," "make fun of," and, in general, be "obnoxious" to the players on the field, (without their knowledge). The result was instant disaster; all nine players fell apart, just as in the game the previous day. Even after the players on defense figured out what was going on, they were unable to recover. However, following only a few sessions such as this, not only in defensive practice but also in hitting practice, players had greatly improved their attentional control.

Regarding instrumentation administration, the SSCI post-game and the CSAI-2 pre-game measures were administered on the days of the contests between the experimental and the control teams, the day of the contest between the control teams, and again before the start of the State District Tournament. Each coach assumed the responsibility of distributing and collecting measures for her/his own team immediately following the completion of the games. The researcher administered post-season measures for all teams after the completion of the season. At this time, all of the in-season measures were also collected. Players and coaches were thanked for their participation!

Data Analysis

Group means and standard deviations on the pre-tests and post-tests were calculated and compared. Because some of the players of the experimental group had already been exposed to an informal psychological skills program, initial differences between the experimental group and the control groups were expected. For this reason, an analysis of covariance was done to reduce the effects of the initial group differences statistically by making adjustments to the post-test means of the two groups. Performance data were taken from the season scorebooks.

CHAPTER IV

RESULTS

Pre-season

Both the State Sport-Confidence Inventory (SSCI) and Competitive State Anxiety Inventory (CSAI-2) were administered at the beginning of the pre-season to determine any initial significant differences in state sport-confidence and competitive state anxiety between the experimental team and the control team. T-tests on the pre-season means of the SSCI measures showed no significant difference between teams in sport-confidence, $t(24) = -.48, p > .05$. T-tests on the pre-season means of the CSAI-2 subscales of cognitive anxiety, $t(24) = -.64, p > .05$; somatic anxiety, $t(24) = -.31, p > .05$; and confidence, $t(24) = .47, p > .05$, also showed no significant differences between teams. The means and standard deviations of each measure are given in Table 6. Hypothesis 1 was supported.

Table 6

Pre-season Means and Standard Deviations for State Sport-Confidence Inventory and Competitive State Anxiety Inventory-2

	Experimental (N = 12)		Control (N = 14)		Total Group (N = 26)	
	M	*SD*	*M*	*SD*	*M*	*SD*
State Sport-Confidence	84.92	16.88	87.93	15.39	86.54	15.84
Cognitive Anxiety	19.08	2.35	20.14	5.26	19.65	4.14
Somatic Anxiety	16.83	5 20	17.43	4.52	17.15	4.76
Confidence	23.67	4.72	22.86	4.04	23.23	4.29

State Sport-Confidence

In addition to the preseason measure, the State Sport-Confidence Inventory

(SSCI) was administered following (post game) three pre-selected competitive situations. The first situation was a conference doubleheader between the experimental team and the control team, the second situation was after a doubleheader with a common conference opponent, and the third situation was after a single district game with what turned out to be a common non-conference opponent.

It was hypothesized that the experimental team would remain more consistent in state sport-confidence as measured by the SSCI in these three selected situations. To test for any significant differences between the experimental and the control teams on the SSCI post game measures, a 2 x 3 (team by game) multivariate analysis of variance (MANOVA) was used on the data. The analysis of post game means showed that although the experimental team mean was higher than the control team mean (89.26 and 82.06 respectively), the difference was not significant, $F(1,17) = 1.21$, $p > .05$. In other words, there was no significant difference between the average of the means of the experimental team and of the control team. There was, however, a significant game effect, $F(2,16) = 4.03$, $p < .05$; and a significant interaction, team by game effect, $F(2,16) = 9.09$, $p < .01$. Means and standard deviations are presented in Table 7. The significant game effect revealed by the MANOVA suggests the combined mean scores of the two teams are significantly different from game to game. Further post hoc analysis revealed the significant difference to be from game 2 (95.00) to game 3 (74.15). Also, the team by game interaction effect showed the difference between the experimental team means and the control team means to be significantly different given the game.

To understand exactly which of the mean scores created the significant difference, Tukey's post hoc test was employed. The results showed the experimental

Table 7

Post Game Means and Standard Deviations for State Sport-Confidence Inventory

	N	*M*	*SD*
Team			
Experimental (EXP)	9	89.26	20.05
Control (CTL)	10	82. 06	14.75
Post game trial total group			
Po-game 1 (exp/ctl)	19	87.23	17.11
Po-game 2 (common opp.)	19	95.00	13.69
Po-game 3 (district)	19	74.15	23.87
Team by Post game trial			
1 EXP Po-game 1	9	84.11	21.36
2 CTL Po-g 1	10	90.10	12.71
3 EXP Po-g 2	9	98.56	12.15
4 CTL Po-g 2	10	91.80	14.82
5 EXP Po-g 3	9	85.11	26.15
6 CTL Po-g 3	10	64.30	16.73

team game 3 mean (85.11) to be significantly higher than the control team game 3 mean (64.30), and the experimental team game 2 mean (98.56) to be significantly higher than the control team game 3 mean (64.30). Otherwise stated, the mean score for the control team post game 3, (64.30), was significantly lower than the mean score for the experimental team post game 2, (98.56), and 3 (85.11). Also, the Tukey test revealed no significant difference from game to game for the experimental team but a significant difference from game 1 (90.10) to game 3 (64.30) and from game 2 (91.80) to game 3 (64.30) for the control team. The game means for the two teams are illustrated in Figure 1.

The results of the MANOVA along with the results of the Tukey test support the second hypothesis; the experimental team did remain more constant in sport-confidence

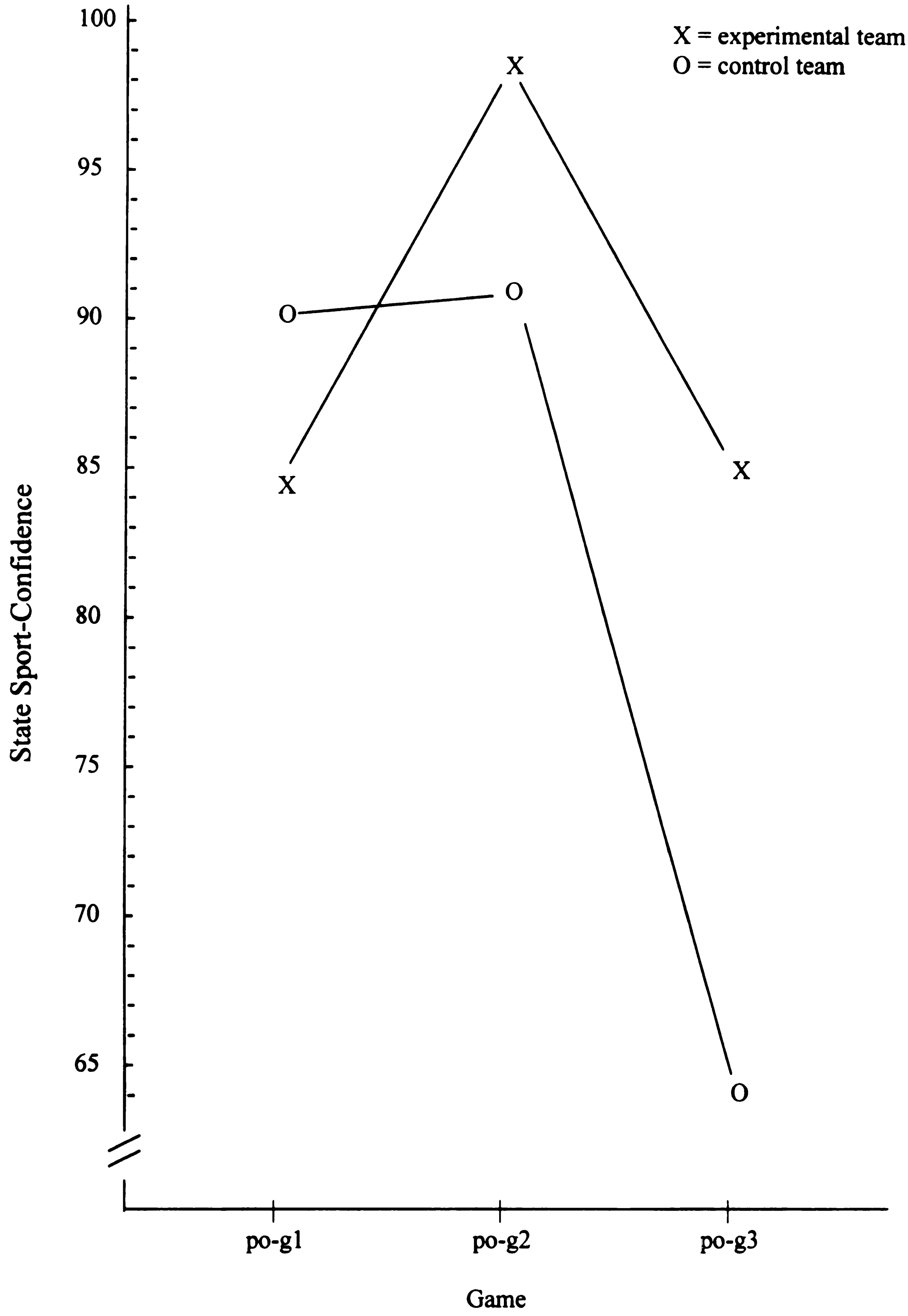

Figure 1. Post Game Means for State Sport-Confidence Inventory.

over selected games as measured by the SSCI. The experimental team showed a benefit from the treatment intervention.

The SSCI was administered again at the conclusion of the season, after all games had been played. A 2 X 4 (team by game) multivariate analysis of variance including all post game measures plus the post season measure was performed to test for a significant increase in sport-confidence over the season by the experimental team. Although this analysis revealed no significant team effect, $F(1,14) = .49, p > .05$, the experimental team again had the higher team mean (90.00 and 85.40 respectively). Also, there was no team by game interaction effect $F(3,12) = 1.76, p > .05$. There was, however, a significant game effect, $F(3,22) = 4.80, p < .05$. A Scheffe post hoc test showed the significance to be between game 2 (95.75) and game 3 (76.13). Means and standard deviations are presented in Table 8.

In a comparison of means, the experimental team mean is lower than the control team mean on the initial post game measure (83.63 and 91.00 respectively) and is higher than the control team mean on the post season measure (93.75 and 89.63 respectively). The experimental team concluded the season higher than the initial post game measure (83.63 initial, 93.75 post) while the control team concluded the season lower than the initial post game measure (91.00 initial, 89.63 post) as illustrated in Figure 1a, Appendix G. These differences, although positive for the experimental team, did not prove to be significant. Hypothesis 3, the experimental team would significantly increase sport-confidence over the season, was not supported.

Table 8

Post game, Post Season Means and Standard Deviations for State Sport-Confidence Inventory

	N	*M*	*SD*
Team			
Experimental (EXP)	8	90.00	18.90
Control (CTL)	8	85.40	11.69
Post game trial total group			
Po-game 1 (exp/ctl)	16	87.31	18.08
Po-game 2 (common opp.)	16	95.75	13.86
Po-game 3 (district)	16	76.13	23. 18
Po-season	16	91.69	8.92
Team by Post game trial			
EXP Po-game 1	8	83.63	22.78
CTL Po-g 1	8	91.00	12.28
EXP Po-g 2	8	98.50	12.98
CTL Po-g 2	8	93.00	15.02
EXP Po-g 3	8	84.13	28.32
CTL Po-g 3	8	68.13	14.25
EXP Po-S	8	93.75	11.75
CTL Po-S	8	89.63	5.24

Competitive State Anxiety

Competitive state anxiety was measured with the Competitive State Anxiety Inventory-2 (CSAI-2). In addition to the pre-season measure, the CSAI-2 was administered before and after three selected games (experimental vs. control, experimental/control vs. common opponent, experimental/control vs. common district opponent) then again at the conclusion of the season. In an attempt to answer specific questions concerning competitive state anxiety, the measures were analyzed as: (1) pre-game measures only, (2) pre-game plus post season measures, and (3) post game measures only. Within the CSAI-2 are the three subscales: cognitive anxiety, somatic anxiety, and confidence. These subscales will be discussed individually in the following presentation of results.

Pre-Game Competitive State Anxiety

Cognitive Anxiety. Because cognitive anxiety is likely to influence performance, the pre-game CSAI-2 cognitive anxiety subscales were exclusively analyzed for statistically significant differences. A 2 x 3 (team by game) multivariate analysis of variance (MANOVA) showed differences between the experimental and the control team to be significant. Means and standard deviations are presented in Table 9. The MANOVA showed a significant team effect, $F(1,19) = 31.27, p < .001$; the experimental team mean for cognitive anxiety (17.58) was significantly lower than the control team mean (23.14). There was a significant game effect, $F(2,18) = 6.91, p < .01$. A Scheffe

Table 9

Pre-Game Cognitive Anxiety Means and Standard Deviations for Competitive State Anxiety Inventory-2

	N	*M*	*SD*
Team			
Experimental (EXP)	12	17.58	2.93
Control (CTL)	9	23.14	3.05
Pre-game trial total group			
Pre-game 1 (exp/ctl)	21	18.71	3.39
Pre-game 2 (common opp.)	21	20. 10	4.17
Pre-game 3 (district)	21	21.43	5.03
Team by Pre-game trial			
EXP Pre-game1	12	17.08	3.29
CTL Pre-g 1	9	20.89	2.15
EXP Pre-g 2	12	17.50	2.78
CTL Pre-g 2	9	23.56	3.05
EXP Pre-g 3	12	18.17	2.72
CTL Pre-g 3	9	25.78	3.96

post hoc analysis showed the significance to be between game 1 (18.71) and game 3 (21.43). There was, however, a non-significant team by game interaction effect, $F(2,18) = 2.90, p > .05$. These findings indicated that the experimental team had more consistent levels of cognitive anxiety than the control team across the season, as seen by the significant team effect. Additionally, all players reported higher levels of pre-game anxiety between games 1 and 3 as the stakes rose for game 3, the district game.

Somatic Anxiety. As with cognitive anxiety, somatic anxiety uniquely influences performance and was therefore, analyzed separately for statistical differences. In general, the control team reported a higher level of somatic anxiety than the experimental team. A 2 X 3 (team by game) MANOVA revealed the game effect to be non-significant, $F(2,18) = .145, p > .05$.; however, the team effect was significant, $F(1,19) = 36.04$, $p < .001$. The experimental team reported a significantly lower level of somatic anxiety (12.61) than the control team (16.78).

The MANOVA also showed the team by trial interaction effect to be significant, $F(2, 18) = 3.61, p < .05$. Tukey's post hoc test revealed the experimental team mean to be significantly lower than the control team mean on game 1 (12 .83 and 16.78 respectively), game 2 (11.75 and 15.78 respectively), and game 3 (13.25 and 17.78 respectively). In addition, the control team mean for game 3 (17.78) was significantly higher than the experimental team mean for game 1 (12.83), game 2 (11.75) and game 3 (13.25). The experimental team did not at any time approach the level of somatic anxiety reported by the control team for game 3. Furthermore, the control team mean for game 1 (16.78) was significantly higher than the experimental team mean for game 1 (12.83), game 2 (11.75) and game 3 (13.25). Finally, the control team mean for game 2 (15.78) was significantly higher than the experimental team mean for game 2 (11.75) and also for game 1 (12.83) at the .05 level.

Means and standard deviations are presented in Table 10. Somatic anxiety mean scores are illustrated in Figure 2. It is interesting to note that the pattern of the means from game to game is the same; however, the experimental team reported a lower level of pre-game somatic anxiety than the control team for each of the three games.

Table 10

Pre-Game Somatic Anxiety Means and Standard Deviations for Competitive State Anxiety Inventory-2

	N	*M*	*SD*
<u>Team</u>			
Experimental (EXP)	12	12.61	2.51
Control (CTL)	9	16.78	2.35
<u>Pre-game trial total group</u>			
Pre-game 1 (exp./ctl)	21	14.52	3.20
Pre-game 2 (common opp.)	21	13.48	3.42
Pre-game 3 (district)	21	15.19	3.00
<u>Team by Pre-game trial</u>			
EXP Pre-game 1	12	12.83	2.90
CTL Pre-g 1	9	16.78	2.11
EXP Pre-g 2	12	11.75	2.73
CTL Pre-g 2	9	15.78	2.90
EXP Pre-g 3	12	13.25	1.91
CTL Pre-g 3	9	17.78	2.05

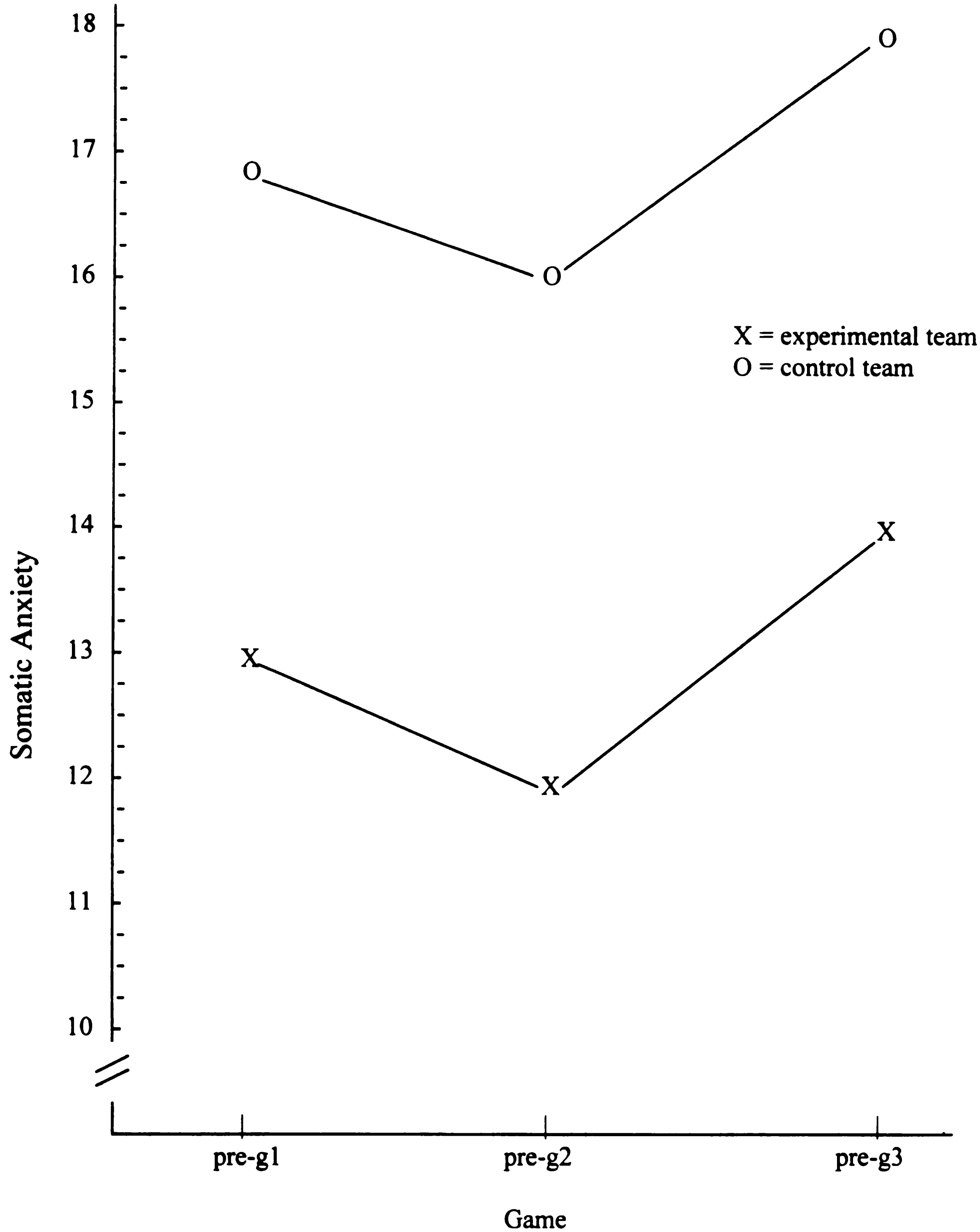

Figure 2. Pre-Game Somatic Anxiety Means for Competitive State Anxiety Inventory-2.

Confidence. As opposed to the SSCI, which measured confidence post game, this CSAI-2 measure of confidence was pre-game. A 2 x 3 (team by trial) MANOVA showed a significant team effect, $F(1,19) = 11.87, p < .01$; the experimental team mean of 26.83 was significantly higher than the control team mean of 22.44. There was, however, no game effect $F(2,18) = .548, p > .05$. Means and standard deviations of the confidence subscale are presented in Table 11.

Table 11

Pre-Game Confidence Means and Standard Deviations for Competitive State Anxiety Inventory-2

	N	*M*	*SD*
Team			
Experimental (EXP)	12	26.83	4.20
Control (CTL)	9	22.44	3.60
Pre-game trial total group			
Pre-game 1 (exp/ctl)	21	25.19	4.36
Pre-game 2 (common opp.)	21	25.29	4.29
Pre-game 3 (district)	21	24.38	4.90
Team by Pre-game trial			
EXP Pre-game 1	12	26.50	4.08
CTL Pre-g 1	9	23.44	4.30
EXP Pre-g 2	12	27.58	3.38
CTL Pre-g 2	9	22.22	3.42
EXP Pre-g 3	12	26.41	5.13
CTL Pre-g 3	9	21.67	3.08

The MANOVA results showed a definite team effect in all three subscales. The experimental team means were consistently higher on the confidence subscale and lower on the anxiety subscales prior to each game. The consistent team effects along with the positive experimental team means, therefore, give support to hypothesis 4. The experimental team did show significantly higher confidence and lower cognitive and somatic anxiety on all pre-game measures.

Pre-Game, Post Season Competitive State Anxiety

A CSAI-2 Post season measure was added to the pre-game measures to test for anxiety and confidence "over the season." It is important to note that not all participants were available for post season measures, which may reduce the power of these results.

Cognitive Anxiety. A 2 x 4 (team by trial) MANOVA of the pre-game measures and the additional post season measure again showed a significant team effect, $F(1,14) = 15.10, p < .01$, for cognitive anxiety; the experimental team mean (17.22) was significantly lower than the control team mean (22.29). The MANOVA also showed a significant game effect, $F(3,12) = 9.97, p = .001$. The means and standard deviations are presented in table 12 and illustrated in Figure 3. Scheffe's post hoc test showed the means from game 1 (18.19) to game 3 (21.61) and game 3 (21.61) to the post season (18.00) to be significantly different. Finally, the MANOVA showed a significant team by game interaction effect, $F(3,12) = 5.11, p < .05$. Tukey's post hoc analysis revealed some interesting significant mean differences. For instance, the control team game 2 mean (22.86) and game 3 mean (26.57) were significantly higher than all of the experimental team pre-game means and the post season mean (16.44, 17.56, 17.89, and 17.0, respectively). The control team game 3 mean (26.57) was also significantly higher than the control team game 1 mean (20.43) and the control team post season mean (19.29).

Table 12

Pre-Game, Post Season Cognitive Anxiety Means and Standard Deviations for Competitive State Anxiety Inventory-2

	N	*M*	*SD*
Team			
Experimental team (EXP)	9	17.22	2.98
Control team (CTL)	7	22.29	3.62
Pre-game trial total group			
Pre-game 1 (exp/ctl)	16	18.19	3.45
Pre-game 2 (common opp.)	16	19.88	4.05
Pre-game 3 (district)	16	21.69	5.47
Po-season	16	18.00	4.03
Team by Pre-game trial			
EXP Pre-game1	9	16.44	3.28
CTL Pre-g1	7	20.43	2.23
EXP Pre-g2	9	17.56	3.09
CTL Pre-g2	7	22.86	3.13
EXP Pre-g3	9	17.89	2.62
CTL Pre-g3	7	26.57	4.04
EXP Po-S	9	17.00	2.92
CTL Po-S	7	19.29	5.09

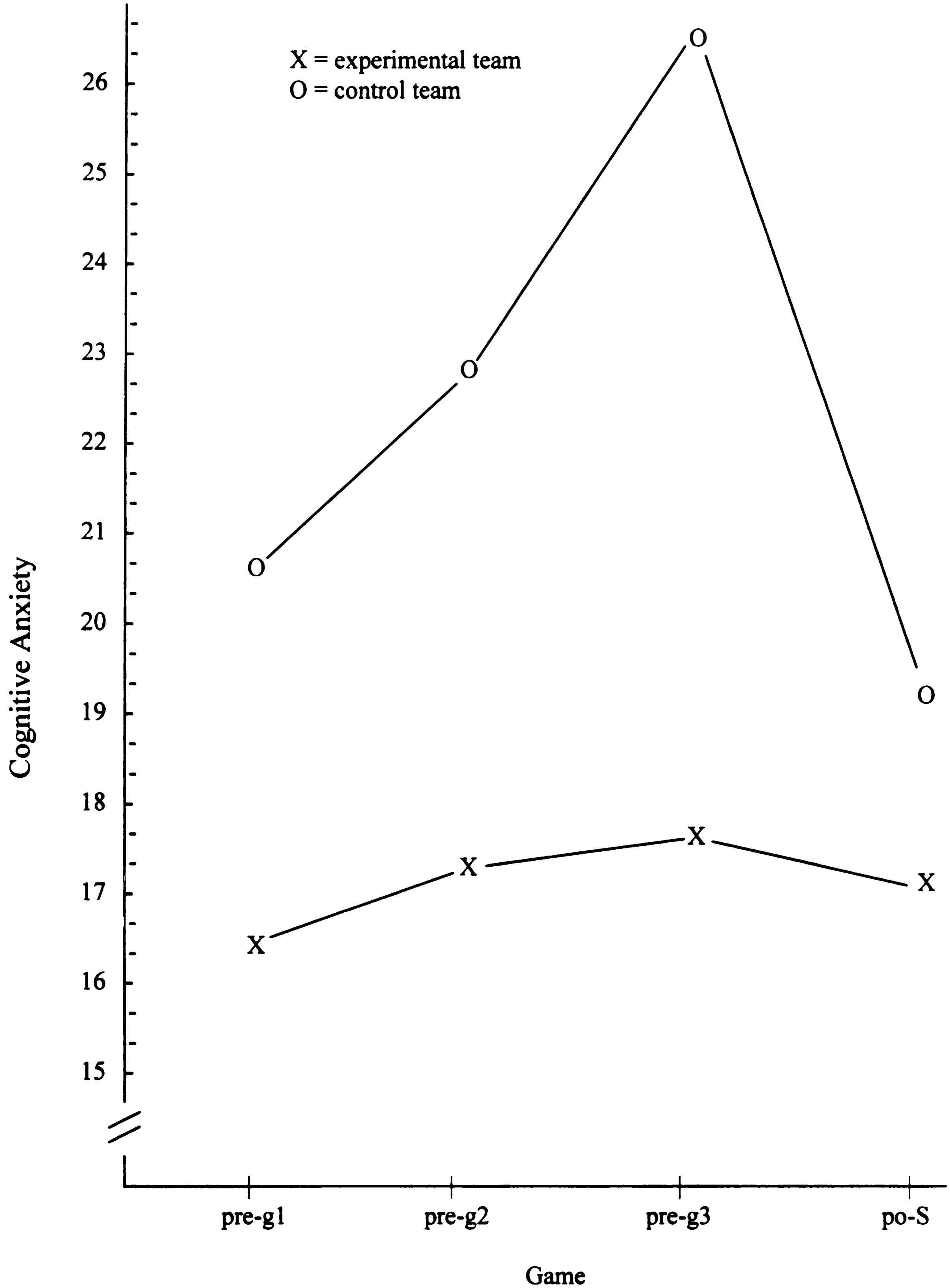

Figure 3. Pre-Game, Post Season Cognitive Anxiety Means for Competitive State Anxiety Inventory-2.

Somatic Anxiety. A 2 x 4 (team by trial) MANOVA also showed the difference in somatic anxiety team means to be significant, $F(1, 14) = 10.30, p < .01$, and the difference in games to be significant, $F(3, 12) = 10.33, p = .001$. There is however, no team by trial interaction effect, $F(3,12) = 1.42, p > .05$. Means and standard deviations are presented in Table 13. A further contrast of trials was done to test for constancy over the season. Scheffe's post hoc test showed the difference between game 3 (15.62) and the post season measure (12.13) to approach significance. No other differences were found.

Table 13

Pre-Game, Post Season Somatic Anxiety Means and Standard Deviations for Competitive State Anxiety Inventory Inventory-2

	N	*M*	*SD*
Team			
Experimental (EXP)	9	12.47	2.39
Control (CTL)	7	15.54	2.93
Pre-game trial total group			
Pre-game 1 (exp/ctl)	16	14.06	2.86
Pre-game 2 (common opp.)	16	13.44	2.99
Pre-game 3 (district)	16	15.62	2.78
Po-season	16	12.13	4.06
Team by Pre-game trial			
EXP Pre-game 1	9	12.44	2.40
CTL Pre-g 1	7	16.14	1.95
EXP Pre-g 2	9	12.33	2.96
CTL Pre-g 2	7	14.86	2.55
EXP Pre-g 3	9	13.67	1.58
CTL Pre-g 3	7	18.14	1.68
EXP Po-S	9	11.44	2.60
CTL Po-S	7	13.00	5.53

Confidence. For the confidence subscale, a 2 x 4 (team by trial) MANOVA revealed a significant team effect, $F(1, 14) = 5.20, p < .05$; the experimental team mean of the four trials (27.47) was significantly higher than the control team mean of the four trials (24.14). The MANOVA also revealed a significant game effect, $F(3,12) = 5.98, p =.01$. Tukey's post hoc test showed a significant difference between the game1mean (23.94) and the post season mean (28.31) and a difference that approached significance between the game 3 mean (24.25) and the post season mean (28.31). The MANOVA, however, showed no interaction effect, $F(3, 12) = 1.72, p > .05$. Means and standard deviations are presented in Table 14.

Table 14

Pre-Game, Post Season Confidence Means and Standard Deviations for Competitive State Anxiety Inventory-2

	N	*M*	*SD*
Team			
Experimental (EXP)	9	27.47	4.64
Control (CTL)	7	24.14	3.94
Pre-game trial total group			
Pre-game 1 (exp/ctl)	16	23.94	4.46
Pre-game 2 (common opp.)	16	25.56	4.10
Pre-game 3 (district)	16	24.25	5.12
Po-season	16	28.31	4. 80
Team by Pre-game trial			
EXP Pre-game1	9	27.00	4.58
CTL Pre-g 1	7	24.57	4.24
EXP Pre-g 2	9	27.44	3.75
CTL Pre-g 2	7	23.14	3.34
EXP Pre-g 3	9	26.56	5.18
CTL Pre-g 3	7	21.29	3.40
EXP Po-S	9	28.29	5.04
CTL Po-S	7	27.57	4.76

Again, the MANOVA results show a team effect in all three subscales. The experimental team mean of the four trials was significantly higher on the confidence subscale and lower on the anxiety subscales than the control team mean. Therefore, hypothesis 5, the experimental team will remain constant or report higher confidence and lower cognitive and somatic anxiety at the conclusion of the season, was supported.

Post Game Competitive State Anxiety

Cognitive Anxiety. A 2 x 3 (team by game) multivariate analysis of variance (MANOVA) showed differences between the experimental team and the control team to be significant. Means and standard deviations are presented in Table 15. The MANOVA showed a significant team effect, $F(1,17) = 7.91$, $p < .05$, and a significant game effect, $F(2,16) = 10.33$, $p = .001$. There was however, no significant team by game interaction

Table 15

Post Game Cognitive Anxiety Means and Standard Deviations for Competitive State Anxiety Inventory-2

	N	*M*	*SD*
Team			
Experimental (EXP)	10	17.93	3.94
Control (CTL)	9	21.26	4.27
Post game trial total group			
P0-game 1 (exp/ctl)	19	20.42	4.33
P0-game 2 (common opp.)	19	16.26	4.01
P0-game 3 (district)	19	21.84	4.96
Team by Post game trial			
EXP Po-game 1	10	19. 40	4.30
CTL Po-g 1	9	21.56	4.30
EXP Po-g 2	10	15. 30	3.20
CTL Po-g 2	9	17.33	4.72
EXP Po-g 3	10	19. 10	4.33
CTL Po-g 3	9	24.89	4.96

effect, $F(2,16) = .95, p > .05$. The significant team effect showed the experimental team mean (17.93) to be significantly lower than the control team mean (21.26). A Sheffe post hoc test showed the significant game effect to occur between game 1 (20.42) and game 2 (16.26) and also between game 2 (16.26) and the "season ending" game 3 (21.84). The difference between game 1 and game 3 was not significantly different.

Somatic Anxiety. A 2 x 3 (team by game) MANOVA revealed a significant game effect, $F(2,16) = 7.04, p < .01$, and a significant team by game interaction, $F(2,16) = 9.19$, $p < .01$. There was, however, no team effect, $F(1,17) = .50, p > .05$. Somatic anxiety mean scores and standard deviations are presented in Table 16. Mean scores are illustrated in Figure 4. The post hoc analysis revealed that the significant game difference occurred between game 1 (12.68) and game 3 (15.79) and also between game

Table 16

Post Game Somatic Anxiety Means and Standard Deviations for Competitive State Anxiety Inventory-2

	N	*M*	*SD*
<u>Team</u>			
Experimental (EXP)	10	13.07	5.42
Control (CTL)	9	14.17	3.62
<u>Post game trial total group</u>			
Po-game 1	19	12.68	3.43
Po-game 2	19	12. 31	6.10
Po-game 3	19	15.79	5.71
<u>Team by Post game trial</u>			
EXP Po-game 1	10	12.20	3.49
CTL Po-g 1	9	13.22	3.49
EXP Po-g 2	10	14.00	7.93
CTL Po-g 2	9	10.44	2:30
EXP Po-g 3	10	13.00	4.92
CTL Po-g 3	9	18.89	5.06

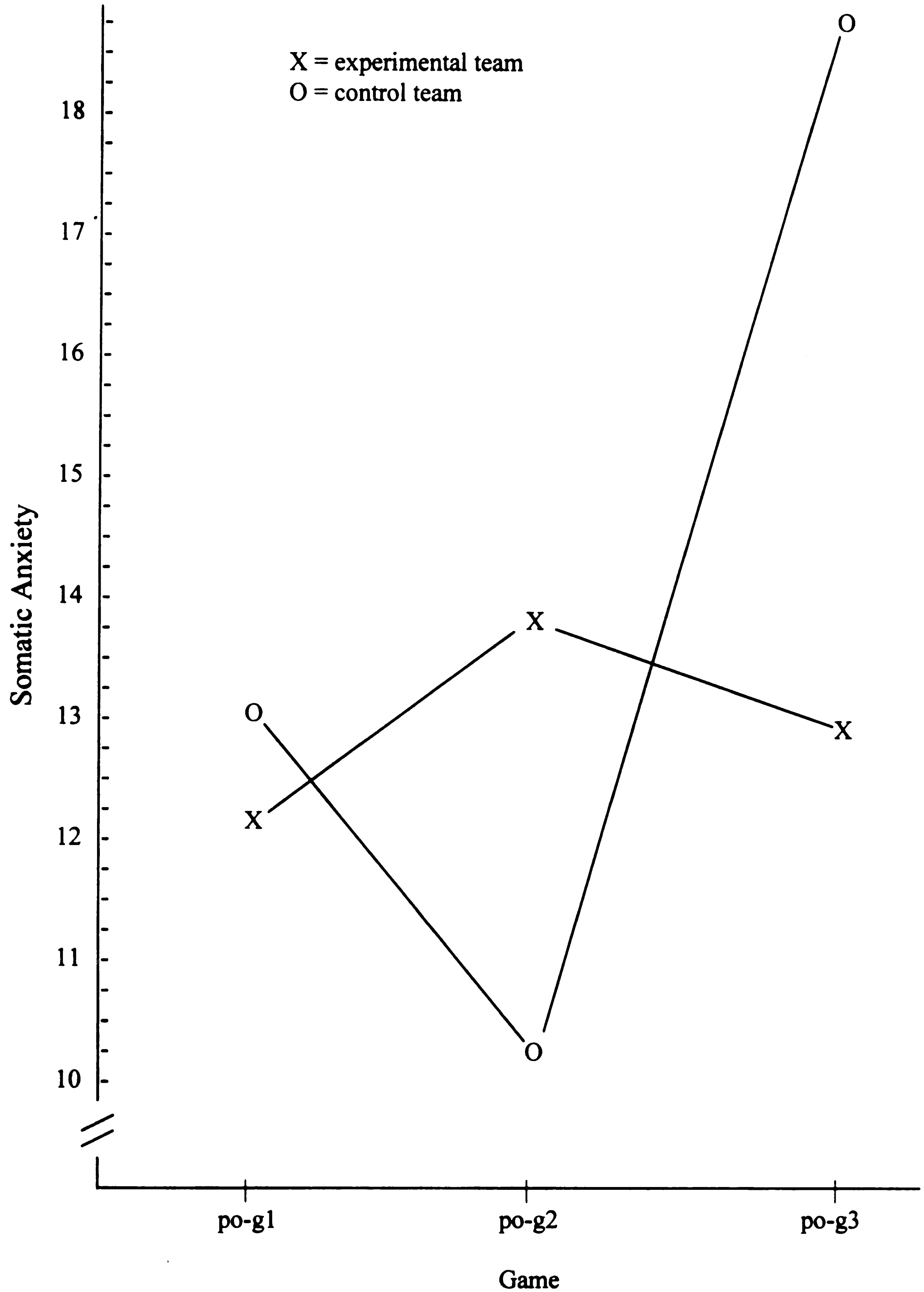

Figure 4. Post Game Somatic Anxiety Means for Competitive State Anxiety Inventory-2

2 (12.31) and game 3 (15.79) at the .05 level. As for the significant interaction effect, a Tukey test revealed that the control team game 3 mean (18.89) was significantly higher than the control team game 2 mean (10.44) at the .01 level of significance. The control team game 3 mean (18.89) was also significantly higher than the experimental team game 1 mean (12.20), the experimental game 3 mean (13.00), and the control team game 1 mean (13.22), at the .05 level of significance.

Confidence. A 2 x 3 (team by game) MANOVA revealed a significant team effect, $F(1,17) = 6.14, p < .05$, for the post game confidence subscale. Means and standard deviations of the confidence subscale are presented in Table 17. The experimental team mean (25.93) was significantly higher than the control team mean (22.70). Also, there was a significant game effect, $F(2,16) = 9.13, p < .01$. A Scheffe post

Table 17

Post Game Confidence Means and Standard Deviations for Competitive State Anxiety Inventory-2

	N	*M*	*SD*
Team			
Experimental (EXP)	10	25.93	5.41
Control (CTL)	9	22.70	3.97
Post game trial total group			
Po-game 1	19	24.53	5.14
Po-game 2	19	27.78	4.87
Po-game 3	19	21.21	5.80
Team by Post game trial			
EXP Po-game 1	10	25.90	5.61
CTL Po-g 1	9	23. 00	4.36
EXP Po-g 2	10	28. 00	4.40
CTL Po-g 2	9	27.56	5.62
EXP Po-g 3	10	24.50	6.22
CTL Po-g 3	9	17.56	1.94

hoc test showed the difference between the game 2 mean (27.78) and the game 3 mean (21.21) to be significant. There was, however, no interaction effect, $F(2,16) = 2.26$, $p > .05$.

The MANOVA results showed a team effect on two of the three subscales of the CSAI-2. The experimental team demonstrated significantly lower cognitive anxiety and significantly higher confidence than the control team on all post game measures. The experimental team mean for somatic anxiety, although lower, was not significantly lower than the control team. Therefore, hypothesis 6, the experimental team will have significantly higher confidence and lower cognitive and somatic anxiety on all post game measures of the CSAI-2, was only partially supported.

Performance

On-Base Average. On-base average is determined by the number of times a batter reaches first base safely divided by the batter's total times at bat. As well as at-bats that result in hits, on-base average also includes "unofficial" at-bats, which are those at-bats when a base is reached through walks, hit by a pitch, catcher interference, etc. On-base average also includes reaching base as a result of an error, it does not, however, include reaching base as a result of a fielder's choice. On-base averages for the experimental team and the control team are presented in Table 18.

T-tests showed the on-base average difference to be non-significant, $t(13) = 1.25$, $p > .05$. However, the t-test compares only the average of the averages and not the actual times on base/times at bat average. For example, the average of the averages as shown by the t-tests was .517, $SD = .084$ and .487, $SD = .073$, for the experimental and the control teams respectively, a difference of .030. The total times on base/total times at bat average is .542 and .495 respectively, a difference of .047. Although this difference is also not likely statistically significant, an analysis of the actual number of times on-base/times-at-bat that make up the averages shows the experimental team to have had 29 *more* baserunners than the control team with 36 *fewer* times at bat. It should also be pointed out that the 29 more baserunners occurred in 5 fewer games. An additional 5 games for the experimental team at an average of 19.57 baserunners/game would total to nearly 127 more baserunners than the control team. Further analysis of the total runs scored (see Chapter 3, Table 4) and the total number of baserunners (see Table 18), shows the experimental team not only had more baserunners, but also had a higher percentage of those baserunners score (55.7% of 548) as compared to the control team (50.0% of 519). This would indicate greater offensive efficiency as well. From a coach's perspective, I would argue that these numbers are significant!

Batting Average. Batting average is defined as the number of times a batter reaches first base safely as a result of a hit and is determined by dividing the number of hits by the number of "official" at-bats. Batting averages are typically lower than on-base averages as base on balls, hit by a pitch or catcher interference are not included as official at-bats and, thus, do not figure in the average. A base on an error, however, is considered an official at-bat and counts the same as an out. Batting averages for the experimental team and the control team are presented in Table 18.

Again, t-tests showed the batting average difference to be non-significant, $t(13) = 1.01, p > .05$. However, the t-test compares only the average of the averages and not the actual hits/official times at bat average. The average of the averages as shown by the t-tests was .298, *SD* = .074 for the experimental team and .258, *SD* = .081 for the control team, a difference of .040. The actual hits/official times at bat average is .305 for the experimental team and .285 for the control team, a difference of .020. Initially, this difference appears to be relatively small but a closer look shows the experimental team with only 2 fewer hits but 63 fewer official at bats. The 2 fewer hits occurred in 5 fewer games. An additional 5 games for the experimental team at the team's average of 8.7 hits/game would total to approximately 41 more hits than the control team. From a coach's perspective, I would, again, argue that these numbers are significant!

Table 18

Season On-Base Averages and Batting Averages

<u>Team On-Base Average</u>			
	Experimental	548 for 1012 = .542	(28 games)
	Control	519 for 1048 = .495	(33 games)
<u>Team Batting Average</u>			
	Experimental	245 for 804 = .305	
	Control	247 for 867 = .285	

Runs Scored. The experimental team scored 305 runs in 28 games (Chapter 3, Table 4) and the control team scored 259 runs in 33 games for a difference of +46 runs for the experimental team. Based on averages, 19.57 baserunners/game in 5 more games would result in approximately 97 more baserunners for the experimental team. If 55.7% of those additional baserunners score, it would result in an another 54 runs. Had the experimental team played as many games as the control team, the experimental team, theoretically, would have out-scored the control team by 100 runs. Once again, from a coach's perspective, I would argue that these numbers are significant.

The above statistics clearly show that the experimental team bettered the control team in each offensive category analyzed. Although the control team finished the season with good offensive statistics (i.e., what coach would complain of an average of nearly 16 base runners per game!), the experimental team finished the season with better offensive statistics (i.e., nearly 20 base runners per game). The season statistical differences combined with experience differences indicated in the demographic information provided by the players (see introduction), indicates a positive effect of PST on offensive softball performance.

CHAPTER V

DISCUSSION

The overall results of this study suggest that PST, under the direction of a coach, can have a positive effect on the cognitions and performance of high school softball players. The experimental team was a younger, less experienced team yet had consistently higher self-confidence, lower anxiety and better offensive performance statistics than the control team.

As hypothesized, there was no significant difference between the experimental team and the control team prior to the season in terms of competitive anxiety and self-confidence. Because both teams were not different on this initial measure, it can be expected that any significant differences on subsequent measures are a result of the PST intervention. However, demographic information provided by the players showed there were age and experience differences. Although unknown initially, the control team was an older, more experienced team (see Chapter 3, Table 2) with nine seniors, *seven more* than the experimental team. The control team exceeded the experimental team in varsity softball experience, total varsity sport experience (all sports), and summer softball experience. With these differences in mind, the most important implication of this study is that through PST it is possible to teach younger, less experienced players to "think" and play like veterans. In all, the experimental team achieved and maintained higher levels of self-confidence, lower levels of competitive anxiety, and completed the season with greater offensive performance.

In regard to self-confidence, as hypothesized, the experimental team remained more constant across selected situations than the control team. The experimental team's initial in-season sport confidence scores were slightly lower than the control team's scores. However, by the second measure the experimental teams' sport confidence scores exceeded those of the control team and then remained more constant through the remainder of the season. These results are consistent with previous research (Hanton & Jones, 1996a; Hughes, 1988; Terry et al., 1998) that reported increases in self-confidence to coincide with PST.

As successful experiences have been shown to be important in developing and maintaining self-confidence (Feltz, 1982; Feltz & Mungo, 1983; George, 1994; Vealey, 1986), the increased self-confidence of the experimental team indicates that the players were able to learn to evaluate ability based on performance versus outcome. An analysis of the "winning percentage" is one means through which this conclusion can be drawn. The winning percentage of the experimental team was just 53.5% as compared to 60.6% for the control team. Included in the winning percentage of the experimental team were losses in nine of the final eleven games (see Chapter 3, Table 3). Yet, the experimental team demonstrated higher levels of self-confidence.

As suggested by Vealey (1986), focusing on performing well (versus winning and losing) is related to higher levels of sport-confidence. Along with this performance orientation, Vealey found the interaction of an individual's definition of success with their perception of ability to also be related to self-confidence. These two findings in Vealey's research were key to the PST intervention in the present study and were subsequently supported. First, a main goal of this PST program was to get players to understand and develop a performance orientation. From the beginning, players readily agreed that winning was a given, as "everyone wants to win;" however, improved performance would ultimately result in more wins. That being decided, throughout the season, improved performance, and not winning, was the primary focus for the experimental team.

Through goal-setting players were focused on performing well as each individual was responsible for setting and evaluating challenging but realistic long term "dream" goals, and season goals as well as short term daily practice or competition goals (Orlick, 1986; Orlick & Partington, 1988). A key part of the process of goal-setting for this high school age group was learning the controllable and uncontrollable aspects of softball and then setting goals and evaluating success accordingly (Burton, 1989b). For example, "readiness" in the batter's box, and swing execution are controllable aspects of hitting. A pitcher's effectiveness or an umpire's strike zone are not controllable aspects. A batters' focus and subsequent goal evaluation would then be on readiness in the box and/or swing execution (depending on the individuals' hitting goals) and not on the opposing pitcher or the umpire. A focus on the controllable aspects of softball increased the opportunity for perceived success and each perceived success increased the expectation that future performances were also likely to be successful (Bandura, 1977). As a result, self-confidence was enhanced.

Second, redefining success in a failure-oriented game such as softball (a "successful" batting average of .400 means failing six of ten times) became an essential part of this PST program. Conventional wisdom tells us that a ball that "drops in" for a hit is a success and one that is caught for an out is a failure. However, with the nature of the game of softball, it is entirely possible for a poorly hit ball to result in a hit and a well hit ball to be caught. Therefore, as pitching effectiveness and/or defensive positioning are not controllable factors of the game, "hitting .400," often viewed as a performance goal was considered an outcome goal.

Players instead set goals to focus on aspects of swing execution and contact. A well hit ball achieved through correct swing execution, whether resulting in a hit or an out, was considered success. Likewise, a poorly hit ball due to a mechanical error was considered something to improve upon; again regardless of whether it resulted in a hit or an out. Also, a strike out as a result of a questionable umpire call was considered bad luck (not related to ability, Feltz, 1984) and was not dwelled upon! Going a step further, each player had her own individual goals of swing execution depending on stage of learning, strengths, and weaknesses, and evaluated success accordingly. If, for example, the batter achieved her performance goal (i.e., correct head position throughout the at bat) yet struck out, the batter was successful, and one step closer to developing a total swing. Using this definition of success, a .400 batting average did not effectively represent performance, as perceived success would actually be much higher. Ultimately, successful experiences were increased and self-confidence again was enhanced.

As an example of the effectiveness of this strategy, at one point during the season, a player (the #4 "power hitter") on the experimental team was waiting to bat in the last inning of a game where the opponent was ahead by 3 runs. After going "0-3" her previous at bats, she was reminded that although these at-bats did not result in "hits," she was, in fact, hitting the ball very hard. With bases loaded, and the confidence that she was having a good day at the plate, she hit a three run triple to tie the game. Keeping in mind that this was a learning experience; it should be noted that this player was very upset about her previous at-bats (with an outcome focus) until she was reminded about how hard she was hitting the ball (a performance focus). Because of her understanding of PST to this point in the season, upon being reminded, her immediate response was, with a smile; "I have hit the ball hard."

Although we considered goals based on hitting mechanics, fielding mechanics, and pitching mechanics to be performance goals, the current literature considers these types of goals to be "process goals" (Gould, 2001). At the time of this study, process goals had yet to be identified. However, it seemed only logical that this type of goal would be most effective as the realization of the high number of uncontrollable factors in the game of softball became apparent, especially as they relate to performance measures such as batting averages, fielding averages, and earned run averages.

Because the skills in this PST program were presented as a package, it is not possible to know the exact effect of each skill in regard to these results. It could very well be that each skill meant something different to each player and, therefore, played a different role in each individual's success. It is known, however, that the PST package resulted in positive results for the experimental team. Goal-setting was an integral part of PST because, as mentioned previously, it helped develop and maintain a primary focus on performance. Beyond that, relaxation, imagery, and self-talk played a role in the successful accomplishment of the performance goals for each player. A brief description of the likely contribution of each skill, in regard to self-confidence, follows.

Although relaxation is usually associated with reducing anxiety, relaxation in this study was also used to reduce the muscle tension that can occur through simply "trying too hard," with or without the presence of anxiety. Muscle tension, regardless of its' source, can create coordination difficulties and as a result, interfere with skill execution

(Nideffer, 1985). Tension free muscles in the game of softball can result in stronger, more accurate throws by the defense, greater arm speed and pitch accuracy for the pitcher, and a stronger, quicker more accurate swing for the batter.

In relation to hitting, for example, tension can create slight differences in swing execution and/or bat path (mechanical accuracy), which can result in much larger differences in the subsequent ball contact (or non-contact). Tension can also interfere with bat speed as muscle groups work against each other. A reduction in tension, therefore, results in a quicker, more accurate swing. A quicker, more accurate swing has many implications for success in hitting. Among them, the quicker the swing, the greater the force exerted on the ball (force = mass x acceleration, mass being equal, i.e. the same bat). Also, the quicker the swing, the longer the batter can wait to initiate the swing and thus, have more time to decide if the pitch is "good" (Elliott, 1992). In addition, the more accurate the swing, the better the ball contact and thus, fewer strike outs, weak ground balls or pop-ups (low percentage "on base" contact) and more hard hit ground balls or line-drives (higher percentage "on base" contact).

Players worked to understand the specific muscles required for a particular skill and then worked to use only those muscles while all other muscles remained relaxed. Relaxation practice started with progressive relaxation group sessions that initially lasted 15-20 minutes and became progressively shorter throughout the season. Understanding the difference between tension and relaxation and then being able to achieve a state of relaxation in a progressively shorter time period, ultimately a few seconds, was a goal of this PST program. As a result of the reduction of tension that occurred through relaxation, players experienced increased success, which again, is associated with higher levels of self-confidence. The results in this study are consistent with the previous but somewhat limited research that found improvements in performance and fine motor coordination to be associated with progressive relaxation (Kukla, 1976; Lanning & Hisanaga, 1983; Owen & Lanning, 1982).

Also, as suggested by previous research, imagery was used in conjunction with relaxation (Greenspan & Feltz, 1989). Imagery is related to self-confidence in that individuals are able to "see" themselves demonstrating mastery. The visualization of demonstrated mastery can be perceived by the athlete as a performance accomplishment, a form of persuasion, and/or a vicarious experience to the imager, all of which are theorized to be sources of information that influence self-confidence. Imagery, as it relates to self-confidence in this study, played a role in visualizing the successful accomplishment of performance goals, in duplicating demonstrations of correct skill execution, and in preparing for game situations.

In relation to hitting, for example, players, in a relaxed state, used imagery to learn correct hitting mechanics. Following a demonstration by a live, skilled model (versus videotaped, Hall & Erffmeyer, 1983) players would imagine themselves duplicating the correct mechanics. Key points were emphasized, visualized then physically practiced in various drills. Not only were key points duplicated quickly, but finer details of the swing were duplicated as well, with little or no further instruction. This strategy had to be carefully monitored, however, as sometimes non-desirable details could also be duplicated. For instance, during the preseason, players would practice hitting in rotating groups of two, since there was an even number of players on the team, hitting partners were always the same. One player in particular was working on her hands and subsequent bat path, yet had a somewhat quirky stride. As her goal was to work on her hands, I did not give feedback on her stride. Before long, I noticed her hitting partner had picked up the same quirky stride. The situation provided a great opportunity to illustrate to them, and to the rest of the team, the effectiveness of modeling/imagery! Both players momentarily altered their hitting goals and easily corrected the stride.

Imagery was also used in hitting strategy. Players would visualize their individual strike zone and the relation of pitches to that zone. Then, in game situations, players would "look" for specific pitch locations depending on the count. If, for example, the count was 3 balls, 0 strikes, the players' "best pitch" to hit would be visualized prior to stepping in the batter's box. Once in the box, the player would swing only if the real pitch matched the visualized pitch. Where most teams would "take" the 3-0 pitch, the experimental team would swing at the pitch, but only if it matched the "best pitch" previously visualized. As most 3-0 pitches are thrown for strikes, it became a high percentage pitch to hit. If, however, a player had a 2 strike count, the whole strike zone, plus a little more to account for umpire perception, would be visualized and the batter would "see" pitches in that zone then prepare to hit any pitch that matched the visualization.

Consistent with previous research (Orlick & Partington, 1988; Vadocz et al., 1997) players reported improvement in imagery ability, with practice. In addition, several players reported learning to "slow" the pitch down and make it "look" bigger when facing an exceptional pitcher. This ability may be illustrated in the hitting performance of the district game (the third measure, toward the end of the season). Facing the same "all-state" pitcher as the control team, the experimental team produced 12 hits and 9 runs versus the control team's 5 hits and 2 runs. Following the experimental team's game, the opposing coach commented that his pitcher had not been hit that hard all season. Also, it is interesting to note that SSCI measures taken following these games showed the experimental team to have significantly higher sport-confidence than the control team, even though both teams lost by 10 runs in 6 innings. Indicating, again, that a performance orientation and the subsequent perception of success, is related to self-confidence. Although success in this situation cannot be totally attributed to imagery, it is consistent with previous research that found increases in self-confidence to coincide with imagery (Feltz & Ressinger, 1990; Vadocz et al., 1997).

Finally, self-talk is associated with increases in self-confidence (Landin & Hebert, 1999). In the realm of self-talk, the experimental team focused on positive communication between players, cue words and/or task-relevant statements, and positive thoughts (that often went along with positive/successful mental images). In relation to positive communication, for example, players - and coaches, on the experimental team worked to eliminate the word "don't," in any communication. "Don't" not only has a negative connotation, it also has the potential to produce the action to be avoided (Carron, 1984). Phrases such as "don't worry about it," and "don't swing at the high ones," (two very common phrases in high school softball) were replaced with "you've got the next one," and simply, "strikes." A visual image of the top (or bottom) of the strike zone would accompany the word "strikes."

Cue words and task-relevant statements played a role in skill acquisition and execution. Statements such as "head down," "hands to the ball," "glove down," and "two hands," helped players focus on the desired action in learning or performing a skill.

Although the teaching of physical skills would occur in practice, verbal cues also served as reminders of key points and aided player focus and performance in game situations. In terms of error correction, a key strategy for every player on the experimental team following an error was, to momentarily relax, imagine the skill performed correctly and repeat a word or phrase to reinforce the correction. For example, if a defensive player incorrectly anticipated a bounce which brought her hands up early and led to the ball going between her legs, every player on the team was to relax, "see" the hands stay low to make the play correctly, and repeat the phrase "glove down." Immediately following, would be a *positive* communication to the player who made the error. As a result, consecutive errors, which often lead to the "bad inning," were rare. Also, with practice the whole process took only seconds, outside observers would probably not notice anything different.

Self-talk also included positive self-statements (Rushall et al., 1988). "The Little Engine That Could" (Piper, 1976) was a team role model. Rather than "I can't" statements, players said, "I can!" "I CAN hit that pitcher" creates a whole different approach to hitting than "I can't hit that pitcher." Sounding repetitive, self-talk contributed to performance success which is associated with increased levels of self-confidence and coincides with previous self-talk and PST research (Hanton & Jones, 1999b; Landin & Hebert, 1999; Terry et al., 1998).

A possible limitation of this study in regard to sport-confidence was that the sport-confidence measures were taken post competition. However, post competition for "game" 1 and 2 was actually post doubleheader, only game 3 was a single game. In that performance has been found to more strongly predict self-confidence, than self-confidence predicts performance, the SSCI scores may have been more strongly influenced by the performance of the second game versus the combination of the two games. In relation to the first measure, between the experimental team and the control team, the measure was taken following a second game win by the control team. More important however, in the same game, members of the experimental team acknowledged (in post-game discussion) an attentional disruption (created by a "fan") which subsequently resulted in performances below expectations. As this doubleheader occurred relatively early in the season (the first conference games), players were still learning to focus on the controllable factors of softball and "block out" the uncontrollable factors (i.e., crowd noise). It would have been interesting to also have a post first game measure to see how the performance in each game influenced sport-confidence. The SSCI scores of this first measure were the only confidence scores throughout the season where the control team's mean was higher than the experimental team's mean.

Although there was no support for the hypothesis that the experimental team would have significantly increased sport-confidence at the conclusion of the season, it is interesting to note the differences in the control team and the experimental team from the beginning of the season to the post season. The experimental team's post season measure of sport-confidence was more than 10 points higher than the initial in-season measure of sport-confidence which was taken immediately following the second game loss to the control team (see Chapter 4, Table 8, or Appendix G). On the other hand, the control team's post season measure of sport-confidence was almost 2 points lower than the initial measure taken immediately following the second game win over the experimental team.

A closer analysis shows that the control team concluded the season with a higher winning percentage (60.6%), a higher, second place finish in the conference standings, and a better record in the final 11 games (6-5 with a +36 run differential). Yet, they were unable to completely return to that initial level of sport-confidence. The experimental team concluded the season with a lower winning percentage (53.5%), and a lower, third place finish in the conference standings. In addition, the experimental team faced some of their toughest opponents near the end of the season to go 2-9 with a -59 run differential in the final 11 games. Yet, they exceeded the post season level of sport-confidence for the control team, and their own initial level of sport-confidence, by more than 10 points! Although these measures are not statistically different, this would indicate an effect of PST at the conclusion of the season.

Readers should not misinterpret these results as indicating that through PST, the experimental team no longer cared about winning. On the contrary, this was a very competitive team from a very competitive community where winning *is* important. The fact that this team was able to have increased confidence following an absolutely tough conclusion to the season only reinforces the power of PST, as the experimental team was still able to understand and focus on success! It may be noted here, that with the knowledge, leadership and confidence of the players who returned (all but three), the experimental season was followed with a conference championship season.

In regard to competitive anxiety, the experimental team was hypothesized to have significantly lower cognitive and somatic anxiety than the control team on all pre-game measures of the CSAI-2. Along with this, pre-game confidence as measured by the CSAI-2 was predicted to be significantly higher for the experimental team than for the control team. Results showed support for the hypothesized direction on all three subscales of the CSAI-2.

The experimental team was consistently lower in cognitive anxiety than the control team for all three games in which the measures were taken (see Chapter 4, Table 9). In addition, there was a significant difference between the means of game one and the means of game three as both teams experienced an increase in cognitive anxiety prior to game three. However, it is important to note that this highest measure of cognitive anxiety for the experimental team, prior to game three, was still not as high as the lowest measure of cognitive anxiety for the control team. The experimental team did not experience the level of cognitive anxiety that the control team experienced prior to any of the games in which measures were taken, not even the season determining district game. These results are consistent with previous research that shows individual psychological skills and/or PST to lower cognitive anxiety (Burton, 1983, 1989b; Lanning & Hisanaga, 1983;Terry et al, 1998).

Results were similar for somatic anxiety and again, for confidence. The experimental team reported significantly lower levels of pre-game somatic anxiety than the control team for all three measures. And, as with cognitive anxiety, the experimental team's highest somatic anxiety score (again, prior to game three) did not approach the control team's lowest somatic anxiety score. Prior research has not exclusively represented somatic anxiety as it relates to PST, however, these results are consistent with research that has cited the use of psychological skills to control arousal levels (Feltz & Landers, 1983; Hardy et al. 2001; Vadocz et al. 1997).

As for the confidence sub-scale, the experimental team reported significantly higher levels of confidence than the control team on all three pre-game measures and, again, the experimental team's lowest confidence score was not as low as the control team's highest score. The control team did not experience the level of confidence that the experimental team experienced prior to any of the games in which measures were taken. The positive confidence results for the experimental team, however, should be expected, as the authors of the CSAI-2 report the sub-scale to measure confidence as the opposite of cognitive anxiety (Martens et al., 1990).

Again, because the psychological skills used in this study were presented as a PST package, it cannot be determined exactly which skills, or combination of skills, contributed to lower levels of pre-game competitive anxiety for each individual. However, as a package, PST did produce positive results for the experimental team. Although anxiety was not dwelled upon during the season, it was initially important for the players to understand the arousal/performance relationship and the negative effects that anxiety can have on performance. Once understood, each player then worked to find her own optimal level of arousal, and to understand and recognize her own unique response to anxiety. It was also important, as a coach, to learn about each player and give feedback accordingly. To help coincide with the positive atmosphere created by PST, the season focus was on replicating optimal levels of arousal rather than dwelling on negative responses to anxiety.

Goal-setting and subsequent goal evaluation was an integral part of each player's understanding of the relationship between arousal and performance. Practice or competition goals were recorded and evaluated on a daily basis in player journals and/or competition evaluation forms (Orlick, 1986). In the evaluation process, players looked for patterns of what may have interfered with, and most important, what may have contributed to goal accomplishment, in terms of arousal control. From there, an effort was made to duplicate the positive and eliminate the negative. It is important to note that under-arousal was a concern as well as over-arousal as both are negatively related to attentional focus (Easterbrook, 1959). Less than optimal attentional focus is not only associated with lower performance, but just as important, reduced practice intensity and efficiency. Practice intensity is necessary for goals and goal evaluations to contribute to the understanding of arousal control.

Relaxation, imagery, and self-talk played a role in arousal/anxiety control as well. Relaxation helped to reduce the negative effects of anxiety by reducing unnecessary muscle tension. In addition, relaxation played a role in attentional redirection as "athletes cannot simultaneously concentrate on relaxation and worry" (Nideffer, 1985).

Imagery and self-talk worked in much the same way. Imagery used as previously mentioned, helped to direct attention to task relevant cues, away from worry. Players, however, were also encouraged to use imagery to set appropriate arousal levels prior to practice repetitions and competitions (Feltz & Landers, 1983). Prior to games, for example, players would "see" themselves warming up for the game and during that warm-up, imagine their focus changing from the day at school to the demands of the game. Players would "feel" their muscles getting warm, their throwing arms getting loose, they would "hear" the noise of the crowd, and as they imagined the game was ready to start, "feel" they were ready to have their "best game ever." From there they would imagine mastery performance; throwing the first pitch for a strike, hitting the ball hard, making the tough play, etc. Self-talk would accompany the imagery and relaxation to help reach and regulate the appropriate arousal level (Hardy et al., 2001).

Players eventually learned that the optimal level of arousal was for the most part, a controllable factor and then worked to attain that control. Of course, attaining control was not always easy as new situations often presented new reactions with which players had to learn to deal. Two such situations stand out; both involved the anxiety producing invitation and subsequent playing in the local "Softball Classic" tournament.

The Softball Classic is a prestigious, late season, single-elimination, invitational tournament with the invitation based on a team's win/loss record during the first part of the season. As the tournament selection time approached, the experimental team was a borderline team, however, two wins in an upcoming non-conference, weekend doubleheader would most likely guarantee an invitation. As the significance of these two games emerged, the team's focus changed from performance to outcome; we *had* to win! The result: instant disaster. Not only did the team lose the first game; it was a 10-run/5-inning mercy rule loss (see Chapter 3, table 3, game 8). Between games we talked about the change to an outcome focus (the idea initiated by the players), reviewed controllable versus non-controllable factors, and agreed to go back to what had worked to that point in the season, a performance focus. The second game was a 10-run/5-inning mercy rule win for the experimental team (see game 9). The difference in play was amazing!

Despite the doubleheader split, the experimental team received an invitation to play in the Softball Classic, a Friday night game, under the lights. The invitation was huge for this young team. In the days leading up to the tournament it became apparent to the players that the support from peers, teachers, and the whole community was also huge. “Everyone” was going to be at the game. From my perspective, with the growing anticipation and excitement, we would do well, especially because we had PST! Ha!

My concern started on the bus ride to the tournament site as player energy and emotion was high – really high! However, the plan was to get to the field, warm-up (run and throw), then provide time for individual relaxation and imagery, just as we had done to this point in the season. I was confident that everyone knew what to do. Following the warm-up I told the team that they had the next five minutes to themselves and I suggested, based on their outward behavior, that they concentrate on relaxing, and then “see” themselves performing well, their “best game!” The response I got was unexpected. A senior captain said something to the effect of; “We don’t have time for that stuff here, this is a real game." Huh? A “real” game, what? The team was choosing to disregard what we had worked on since the beginning of the season. I was unprepared.

The previous game ended, the stands were full, and it was our turn to take the field. As the game started and then progressed, the effect of over-arousal/extreme anxiety was very apparent. A “catastrophe” ensued. But it was a short game, only 5 innings (10 run mercy rule, game 18). Players mishandled bunts, dropped throws, “froze” on line drives that were a step away, outfielders ran in on fly balls that were hit deep; it was not good! And, it all took place in front of what quite literally appeared to be the whole community. A community (especially teachers and peers) that would not let them soon forget their performance that night. The players were devastated.

An explanation for this situation may well lie in the cusp catastrophe model of anxiety and performance (Hardy & Fazey, 1987). There was indeed a dramatic decrease in performance and there was no recovery; not even to a moderate level. Also, it was rather evident that players were experiencing cognitive anxiety as well as increasing physiological arousal. Given the unexpected levels of cognitive anxiety/physiological arousal and the lack of experience in dealing with those levels, a simultaneous reduction in both, as suggested by Hardy (1996) would not have happened easily.

In hindsight, it would have been very interesting to have confidence and anxiety measures from that night. What happened? When did it happen? What were they thinking? What were they feeling? Could pre-game anxiety scores have predicted the impending poor performance? And, in hindsight, it would have been interesting to see how different the performance result would have been had we prepared for the extreme anxious reactions. On the other hand, the situation provided a great learning opportunity. We learned for sure that anxiety can have dramatic negative effects on performance and we learned for sure that PST is for "real" games too.

Following this tournament game, we had only the weekend to recover and prepare for the next, very important district game. Confidence and anxiety scores as well as performance statistics from the district game, just three days later, indicate that the devastation from that night was short-lived. Because of PST, the players readily understood what happened and rebounded very quickly. Through the rest of the season players chose to continue to work on and use PST and although, as previously mentioned, the end of the season was tough, confidence remained high, anxiety remained low and performance continued to improve.

The inclusion of the post season CSAI-2 scores provides support for the hypothesis that the experimental team would remain constant or increase confidence and report lower cognitive and somatic anxiety at the conclusion of the season, significantly more than the control team. The greatest support for this hypothesis comes from the significant team effect on all three subscales of the CSAI-2. The experimental team reported significantly lower cognitive and somatic anxiety and significantly higher confidence with all four measures taken into consideration. Although the experimental team did not significantly lower cognitive or somatic anxiety from the first, pre-game measure to the last, post season measure they did remain more constant than the control team. The same is true for confidence; the experimental team remained more constant. In relation to cognitive anxiety, it is interesting to note that the post season measure for the control team, a measure that did not involve an impending competition but rather a general approach to competition, still did not produce scores as low as any pre-competition measure for the experimental team. These results, again, support previous research that found PST to lower anxiety and increase confidence (Terry et al., 1998).

The hypothesis that the experimental team would have significantly higher confidence and lower cognitive and somatic anxiety than the control team on all post game measures of the CSAI-2 was only partially supported as results showed a team effect on only two of the three subscales. The experimental team reported significantly lower cognitive anxiety and significantly higher confidence across all three measures, however, in regard to somatic anxiety, while the experimental team mean was lower than the control team mean across the measures, it was not significantly lower. The fact that these were post-game measures as opposed to pre-game measures provides speculation as to the lack of a team effect for somatic anxiety.

Somatic anxiety results show the post game (post doubleheader) 2 measure to oppose the consistency of results so far (see Chapter 4, Table 16). A closer look at the outcomes of the doubleheader (against a common opponent) shows the control team to have been involved in a lopsided victory, winning their second game by 22 runs. The experimental team, however, escaped with a one run second game victory. It is logical that a one run game would create more somatic anxiety than a 5 inning, 22 run game and therefore, explains the difference in somatic anxiety levels between the teams on the second measure. It is also logical that this one run game would create more somatic anxiety than either the first experimental team post game measure (a second game 5 run loss) or the third experimental team post game measure (a 10 run loss).

Although this second CSAI-2 measure shows the experimental team to have reported its' highest level of post game somatic anxiety (14.00), it is interesting to note that the scores also reflect the teams lowest level of post game cognitive anxiety (15.30) and the highest level of post game confidence (28.00). This provides support for the multidimensional nature of competitive state anxiety (Martens, 1977). It might also provide insight as to why the experimental team was able to successfully stop the opponents comeback attempt in the late innings of the game.

When considered in relation to the catastrophe model, although somatic anxiety and physiological arousal are considered to be slightly different constructs, the model predicts that under conditions of low cognitive anxiety, physiological arousal should have small effects on performance (Hardy, 1996). Therefore, although the players reported experiencing their highest level of somatic anxiety, the cognitive anxiety scores indicate that it would not effect performance. In addition, relative to self-efficacy theory (Feltz, 1982) performing well enough under intense conditions to win a one run game would enhance perceptions of success and thereby increase self-confidence, as reflected in the post game CSAI-2 confidence scores. This second game in which measures were administered also reflects the experimental team's highest level of reported self-confidence as measured by the SSCI (also a post game measure).

Also interesting with this second measure, is a comparison of the experimental team's pre-game cognitive and somatic anxiety scores with their post game scores (cognitive pre-game, 17.50, cognitive post game, 15.30; somatic pre-game 11.75, somatic post game 14.00). From pre-game to post game, cognitive anxiety decreased while somatic anxiety increased. This is consistent with multidimensional anxiety theory, which theorizes that the two components of anxiety change differently during performance evaluation (Gould et al., 1984).

The hypothesis that the experimental team would have significantly higher on-base averages and batting averages than the control team was not supported statistically. However, the case was made for the experimental team having out performed the control team relative to these averages. In addition, the experimental team out performed the control team in terms of total runs scored. Because this PST program was presented as a package, it is not known to what extent each psychological skill contributed to performance success for each individual player. However, that PST or components of PST would result in increased performance is consistent with previous research (Hall & Erffmeyer, 1983; Kendall et al., 1990; Landin & Hebert, 1999; Patrick & Hrycaiko, 1998; Seabourne et al., 1985).

Goal-setting contributed to increased performance by giving players both focus and direction. In addition, setting goals based on redefined success (performance/process versus outcome) contributed to greater perceptions of success. At the same time, as players became aware of, and internalized, controllable versus uncontrollable factors of the game, they were not distracted by what may have previously been perceived as "failure," such as a well-hit line drive resulting in an out. Although the experimental team knew they would likely give up runs (largely due to inexperienced pitching, an uncontrollable factor) they were confident in their ability to put the bat on the ball and score runs. Players were able to enter the batter's box in a positive, relaxed state and focus on the pitch. A review of the previous discussion on confidence and anxiety may provide a greater understanding of the possible contribution of each psychological skill to the performance results as they relate to this study.

The inter-relatedness of the constructs involved in producing positive results makes it hard to separate and discuss each one individually. Self-confidence increases because of successful performances, the negative effects of anxiety decrease because of the confidence gained through successful performances and performance increases because self-confidence is high and anxiety is low. In addition, as supported by research, the present study included, psychological skills contribute to increased self-confidence, decreased anxiety, and increased performance. However, as stated by Martens (1987), PST is not magic. Effort is required to attain (and retain) psychological skills as well as physical skills. And, as evidenced in this study, both require a learning process, and practice. Also, PST will not allow an individual to perform beyond her/his ability level (as demonstrated by the experimental team's pitchers), PST can only help an individual strive to perform to her/his potential, and hopefully make the experience more enjoyable along the way.

In general, players on the experimental team responded positively to the implementation of PST. The players tended to be academically oriented and appreciated the added information regarding the practical application of psychological concepts. Although some were not sure that PST would make a difference, all were willing to try. However, so that PST would have a true chance to make a difference, it was important for players to understand that they could talk freely about perceptions and evaluations and know that their status on the team would not change as a result. Parent feedback and support was positive as well. As a matter of fact, in the summer league, following this spring season, there was more than one game when a parent informed me that a player was momentarily off by herself preparing mentally so that she would be ready to compete. I believe I was instructed to "let her do her thing." Teachers and other coaches were not as supportive as they really did not understand what we were doing or trying to accomplish.

Implications. There are three important implications resulting from this study. First, athletes of high school age and ability will benefit from a PST program. Most importantly, with the age and experience differences between the experimental and control teams in mind, this study demonstrates that it is possible to teach younger, less experienced players to "think" and play *beyond* that of veterans. Overall, the younger, less experienced experimental team was more confident, less anxious, and had better performance. In general, the addition of PST to the daily practice schedule was a logical addition. In that PST contributed to practice efficiency, learning PST did not add to the total practice time. Subjectively, players were more focused, they advanced physical skills more quickly, and they learned game strategies more easily than previous non-PST teams.

A second implication is that, as with physical skills, PST requires a learning process. Players need to learn not only what psychological skills are, but also, to learn how to use the skills effectively. In addition, and apparently as important, players must learn to trust that the skills will work, even in "real games." In this study, learning PST was a continual process. Players were introduced to the skills; they practiced the skills, evaluated the skills and then adjusted and eventually refined the skills. And then they practiced them again. The consistent reinforcement, practice and evaluation of psychological skills throughout the season was key to PST effectiveness. As with physical skills, psychological skills improved with practice and experience.

A third implication is that a coach can effectively teach PST. Key to *this* coach effectively teaching PST, however, is a thorough understanding of basic psychological principles, an understanding gained through some rather impressive graduate classes. Also unique to this PST program were my own perceptions of what I had learned in those classes combined with what I had learned through my previous coaching experiences. Interestingly, those perceptions were altered following a summer softball playing experience of my own (the first in 10 years). I believe my teaching of PST was more effective the following season after personally learning to use the same skills competitively. I was reminded that the game is quite different inside the foul lines.

The experimental team continued to work on, and implement PST the following season. Although there were no measures taken that season, the returning players' psychological skills and the subsequent effectiveness of the skills seemed to improve even more with the continued practice. The team appeared to play every game with confidence and there were *no* "catastrophe" performances. Also important, the returning players became advocates of PST and effective models for the new players. Season statistics reflected a continued improvement in team performance as on-base average, batting average, and the total runs scored, all increased from the experimental year. The team finished the following season with a 20 – 8 win/loss season record and a 12 – 2 conference record. Most impressive, 11 of the 12 conference wins were 5 inning/10 run mercy rule wins. This was a considerable improvement from the experimental year.

Also interesting, following graduation, several players reported continued use of PST. For example, one player reported using PST prior to a surprise test in a college class. She said that she was about to panic along with the rest of the students in the class but then remembered to relax and focus. She continued with positive self-talk, telling herself that she had listened in class and had taken good notes and there was no reason to doubt her ability to answer the questions. She later called to say she had received the only "A" on the test. This would support the claim that PST also results in better participation in any achievement endeavor outside the athletic setting (Martens, 1987; Weinberg & Williams, 2001).

There are several probabilities regarding the results of this study. First, it may be that the scores on the measures were a reflection of what the players on the experimental team learned throughout the season and therefore, players may have responded according to what was believed to be desirable. To be sure, the experimental team did learn a lot about psychological concepts. However, very little attention was paid to the measures, except for the time it took to fill them out. Also, prior to the season, players were asked to answer honestly. They were told that there were no wrong answers and that individual scores would not be known. Based on the open communication that existed between the players and coaches, I believe the scores to be an honest reflection of what each player felt at the time.

Second, as mentioned previously, two of the post game measures were actually post doubleheader. The performance/outcome of the second game most likely had the greater influence on the scores. It may have been more accurate to have measures following each game; however, this would have been more time consuming and more intrusive. Third, one might wonder if maybe my coaching style alone would affect the results of this study. However, I believe the control team coach had a coaching style similar to my own. She provided opportunities for many repetitions and gave generally positive feedback. It should be noted that the control team's post season cognitive (19.29) and somatic (13.00) anxiety scores were also below, and the post season confidence scores (27.57) were also above the norms established for the CSAI-2 (Martens et al., 1990; Table 1, Chapter 2). Finally, maybe the experimental team just had better athletes. Better athletes might result in better performance, and subsequently, lower anxiety and higher self-confidence. However, the control team had some great athletes! If only they were on my team…

Many questions remain in regard to PST and provide a basis for future research. To begin with, this PST program provided a focus on both self-confidence and anxiety. However, is it necessary for a PST program to focus on both self-confidence and anxiety? Would the results also be positive with a focus on one and the exclusion of the other? For example, it has been suggested that self-confidence may be one of the most powerful qualities that elite performers possess, more powerful than anxiety management skills (Hardy et al., 1996). It has also been suggested that anxiety and self-confidence are at opposite ends of a continuum (Martens et al., 1990). Both of these suggestions would lead one to conclude that a PST program could focus exclusively on increasing self-confidence. However, would a focus on self-confidence be enough to improve performance and decrease the negative effects of anxiety?

In addition, the catastrophe model (Hardy & Fazey, 1987) suggests that cognitive anxiety and self-confidence can be experienced at the same time and predicts that cognitive anxiety can sometimes be facilitative. Research has indeed shown cognitive anxiety to be facilitative (Jones & Swain, 1995). If a PST program were to focus exclusively on increasing self-confidence, would cognitive anxiety be more easily perceived as facilitative? Or, would it still be necessary to address responses to anxiety. On the other hand, how would a focus on just anxiety management influence self-confidence and performance?

Furthermore, the players on the experimental team learned PST the first season, however it seems they began to internalize PST the following season. In addition, the experimental team experienced a great improvement in both performance and outcome the following season. Was the improvement from the first season to the second season a result of PST or simply a result of maturity? A multi-year study along the same lines as the present study may help to answer these questions.

Finally, there is a need to better understand PST from the athlete's perspective, to investigate PST from "inside" the athlete's mind. It would be interesting to find out, for example, if athletes are aware of increases in confidence and decreases in anxiety as they learn and implement psychological skills. In relation to this study, it would be interesting to know if the experimental team was aware that, although the outcomes were less than what they expected, they still had high levels of confidence and low levels of anxiety, especially as compared to the higher ranked control team. If athletes were indeed aware of such results, would this knowledge further reinforce confidence in otherwise anxiety producing situations? Also, it is important to try to understand the athlete's initial reactions to PST and what it takes for the athlete to buy-in to PST. It is important to know if certain psychological skills are relied on more that others in relation to certain situations for a certain type of athlete. In relation to the younger athlete, it is important to find out if and how a parent's support, or lack of support, affects PST. A greater understanding from the athlete's perspective would contribute to more efficient teaching and subsequent learning and implementation of skills.

In conclusion, a psychological skills training program that was implemented by a coach did effectively increase self-confidence, decrease anxiety and increase performance, especially as compared to an older, more experienced control team. Key to effectively teaching PST was an understanding of the psychological skills used in the program and how they relate to the game of softball. Also key to effectively teaching PST, was the consistent reinforcement of psychological skills throughout the season. Just as with physical skills, players were consistently reminded and given opportunities to practice psychological skills. As it was not enough to just tell players to "watch the ball," it was not enough to just tell them to "relax and imagine success." Learning PST was a continual process that required effort on the part of the coach and the players, and needed to be evaluated often to assure success.

APPENDIX A

Demographic Survey

Background Information

ID NUMBER: (to be assigned): ____________

Age: ______ Grade in school: ____________

Years of Varsity experience in all sports: _______

Years of Varsity experience in softball: _______

Years of Varsity experience in Summer softball: _______

Rate your ability to play softball compared to other softball players in the league:

Batting

1	2	3	4	5
below average		average		above average

Baserunning

1	2	3	4	5
below average		average		above average

Team Play

1	2	3	4	5
below average		average		above average

Concentration

1	2	3	4	5
below average		average		above average

Covering bases

1	2	3	4	5
below average		average		above average

Fielding

1	2	3	4	5
below average		average		above average

Situation play

1	2	3	4	5
below average		average		above average

Pitching
(if you're a pitcher)

1	2	3	4	5
below average		average		above average

Visualize the play before it happens
(Imagery)

1	2	3	4	5
below average		average		above average

APPENDIX B

State Sport-Confidence Inventory (SSCI)

STATE SPORT-CONFIDENCE INVENTORY

Think about how confident you feel right now about performing successfully in the upcoming competition.

Answer the question below based on how confident you feel right now about competing in the upcoming contest. Compare your self-confidence to the most self-confident athlete you know.

Please answer as you really feel, not how you would like to feel. Your answers will be kept completely confidential.

HOW CONFIDENT ARE YOU RIGHT NOW ABOUT COMPETING IN THE UPCOMING CONTEST? (circle number)

		Low			Medium					High
1.	Compare the confidence you feel right now in YOUR ABILITY TO EXECUTE THE SKILLS NECESSARY TO BE SUCCESSFUL to the most confident athlete you know.	1	2	3	4	5	6	7	8	9
2.	Compare the confidence you feel right now in YOUR ABILITY TO MAKE CRITICAL DECISIONS DURING COMPETITION to the most confident athlete you know.	1	2	3	4	5	6	7	8	9
3.	Compare the confidence you feel right now in YOUR ABILITY TO PERFORM UNDER PRESSURE to the most confident athlete you know.	1	2	3	4	5	6	7	8	9
4.	Compare the confidence you feel right now in YOUR ABILITY TO EXECUTE SUCCESSFUL STRATEGY to the most confident athlete you know.	1	2	3	4	5	6	7	8	9
5.	Compare the confidence you feel right now in YOUR ABILITY TO CONCENTRATE WELL ENOUGH TO BE SUCCESSFUL to the most confident athlete you know.	1	2	3	4	5	6	7	8	9
6.	Compare the confidence you feel right now in YOUR ABILITY TO ADAPT TO DIFFERENT COMPETITIVE SITUATIONS AND STILL BE SUCCESSFUL to the most confident athlete you know.	1	2	3	4	5	6	7	8	9

HOW CONFIDENT ARE YOU <u>RIGHT NOW</u> ABOUT COMPETING IN THE UPCOMING CONTEST? (circle number)

7.	Compare the confidence you feel right now in YOUR ABILITY TO ACHIEVE YOUR COMPETITIVE GOALS to the most confident athlete you know.	Low Medium High 1 2 3 4 5 6 7 8 9
8.	Compare the confidence you feel right now in YOUR ABILITY TO BE SUCCESSFUL to the most confident athlete you know.	Low Medium High 1 2 3 4 5 6 7 8 9
9.	Compare the confidence you feel right now in YOUR ABILITY TO THINK AND RESPOND SUCCESSFULLY DURING COMPETITION to the most confident athlete you know.	Low Medium High 1 2 3 4 5 6 7 8 9
10.	Compare the confidence you feel right now in YOUR ABILITY TO MEET THE CHALLENGE OF COMPETITION to the most confident athlete you know.	Low Medium High 1 2 3 4 5 6 7 8 9
11.	Compare the confidence you feel right now in YOUR ABILITY TO BE SUCCESSFUL BASED ON YOUR PREPARATION FOR THIS EVENT to the most confident athlete you know.	Low Medium High 1 2 3 4 5 6 7 8 9
12.	Compare the confidence you feel right now in YOUR ABILITY TO PERFORM CONSISTENTLY ENOUGH TO BE SUCCESSFUL to the most confident athlete you know.	Low Medium High 1 2 3 4 5 6 7 8 9
13.	Compare the confidence you feel right now in YOUR ABILITY TO BOUNCE BACK FROM PERFORMING POORLY AND BE SUCCESSFUL to the most confident athlete you know.	Low Medium High 1 2 3 4 5 6 7 8 9

APPENDIX C

Competitive State Anxiety Inventory-2 (CSAI-2)

COMPETITIVE STATE ANXIETY INVENTORY – 2
ILLINOIS SELF-EVALUATION QUESTIONNAIRE (5)

Name: ______________________________ Sex: M F Date: ____________

Directions: A number of statements which athletes have used to describe their feelings before competition are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate *how you feel right now* – at this moment. There are no right or wrong answers. Do not spend too much time on any one statement, but choose the answer which describes your feelings *right now*

	Not At All	Somewhat	Moderately So	Very Much So
1. I am concerned about this competition	1	2	3	4
2. I feel nervous	1	2	3	4
3. I feel at ease	1	2	3	4
4. I have self doubts	1	2	3	4
5. I feel jittery	1	2	3	4
6. I feel comfortable	1	2	3	4
7. I am concerned that I may not do as well in this competition as I could	1	2	3	4
8. May body feels tense	1	2	3	4
9. I feel self-confident	1	2	3	4
10. I am concerned about losing	1	2	3	4
11. I feel tense in my stomach	1	2	3	4
12. I feel secure	1	2	3	4
13. I am concerned about choking under pressure	1	2	3	4
14. My body feels relaxed	1	2	3	4
15. I'm confident I can meet the challenge	1	2	3	4
16. I'm concerned about performing poorly	1	2	3	4
17. My heart is racing	1	2	3	4
18. I'm confident about performing well	1	2	3	4
19. I'm worried about reaching my goal	1	2	3	4
20. I feel my stomach sinking	1	2	3	4
21. I feel mentally relaxed	1	2	3	4
22. I'm concerned that others will be disappointed with my performance	1	2	3	4
23. My hands are clammy	1	2	3	4
24. I'm confident because I mentally picture myself reaching my goal	1	2	3	4
25. I'm concerned I won't be able to concentrate	1	2	3	4
26. I'm confident of coming through under pressure	1	2	3	4
27. My body feels tight	1	2	3	4

APPENDIX D

University Committee on Research Involving Human Subjects (UCRHIS) Approval

MICHIGAN STATE UNIVERSITY

UNIVERSITY COMMITTEE ON RESEARCH INVOLVING HUMAN SUBJECTS (UCRIHS)
206 BERKEY HALL
(517) 353-9738

EAST LANSING • MICHIGAN • 48824-1111

April 25, 1988

Jill Elliott
1105 N. Waverly Rd.
Lansing, MI 48917

Dear Ms. Elliott:

Subject: "THE EFFECTS OF PSYCHOLOGICAL SKILLS TRAINING ON HIGH SCHOOL SOFTBALL PERFORMANCE #88-121"

The above project is exempt from full UCRIHS review. This project has been reviewed by another committee member and approval is granted for conduct of this project.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval prior to April 25, 1989.

Any changes in procedures involving human subjects must be reviewed by UCRIHS prior to initiation of the change. UCRIHS must also be notified promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to my attention. If I can be of any future help, please do not hesitate to let me know.

Sincerely,

John K. Hudzik, Ph.D.
Chair, UCRIHS

JKH/sar

cc: M. Ewing

APPENDIX E

Psychological Skills Season Schedule

PSYCHOLOGICAL SKILLS SEASON SCHEDULE

March

Monday	Tuesday	Wednesday	Thursday	Friday	Sat.
	1 TRYOUTS (through the 15th)	2 →	3 →	4 →	5
7 →	8 →	9 →	10 →	11 →	12
14 →	15 →	16 1st DAY AS A TEAM.	17 PHYSICAL SKILLS PRACTICE – Learning the routine – conditioning, defensive skill drills, game situations, hitting	18 CONTINUE FROM YESTERDAY	19
21 EXPERIMENTAL TEAM, PRE-SEASON MEASURES Consent forms, Demographic survey, SSCI, CSAI-2 DISCUSSION OF PST – goal-setting, self-talk, social reinforcement, attention	22 More on Goal-setting, Examples of effective vs. ineffective goals	23 Reinforcement of psychological skills previously discussed during physical skills practice	24 Continue from yesterday	25 1st IMAGERY SESSION/ EVALUATION 1) Read ch. 6, Nideffer. 2) Watch Carrie bat for understanding of key points. 3) Relaxation and imagery prior to batting practice 4) Batting practice	26
28 Reinforcement of all psychological skills previously discussed during physical skills practice	29 Continue from yesterday	30 Assignment: write own defensive responsibilitie s for each possible situation and use imagery to practice them	31 1) Attention control drills 2) hitting demonstration, emphasis on imagery to reinforce key points		

April

Monday	Tuesday	Wednesday	Thursday	Friday	Sat.
				1 ADMINSTRATION OF PRE-SEASON MEASURES TO CONTROL TEAMS	2
4 Spring Break	5 → 6 of 12 players on	"vacation"	7 Individual skills	8 practice →	9
11 Detailed discussion of arousal/anxiety effects on performance, preparing for competition – pre-competition plan, Orlick (1986), Competition goals – within control	12 Game situations/ strategy	13 Pre-competition plan adjustments Formal relaxation/ imagery sessions Imagery evaluation (ending practice)	14 2 GAMES, NON-Conference Post-competition evaluation – Orlick (1986) as a guide Goal evaluations	15 Game Review Reinforcement of PST Pre-plan adjustments	16
18 Reinforcement of PST during physical skills practice	19 Relaxation/ imagery session – evaluation (end of practice) [Relaxation becoming easier]	20 2 GAMES, NON-Conference Post competition evaluations	21 Game review	22 Discussion of psychological skills becoming individual responsibility Relaxation/ imagery to be done on own outside of practice	23 2 games/ eval.
25 2 NON-CONFERENCE GAMES Evaluations	26 Game review, Start of individual psychologi cal skill evaluations (3 players/ practice)	27 Reinforce-ment continued through all games and practices	28 →	29 →	30 2 games/ eval.

May

Monday	Tuesday	Wednesday	Thursday	Friday	Sat.
2 Pre-competition plan adjustments Relaxation/ imagery (positive self-talk)	3 2 GAMES, Conference w/control team SSCI post game, CSAI-2 pre/post game Competitio n evaluations	4 Game review	5 2 GAMES, Conference Game evaluations	6 Game Review Review PST (especially if changes are necessary or something new comes up)	7
9 1 GAME, NON-CONFERENCE Game evaluations	10 2 GAMES, Conference Game Evaluations	11 Game Review Imagery on own/evaluate Game situations under LOUD conditions to prepare for next opponent	12 2 GAMES, Conference (second measures) SSCI post game, CSAI-2 pre/post game Game evaluations	13 Game review	14
16 Players should be internalizing skills that work by now, continued reinforcement and evaluation	17 2 GAMES, Conference Game evaluations	18 Game review Group relaxation/ imagery, if necessary (if not, on own) Evaluate	19 2 GAMES. Conference (control team 1 vs. control team 2 measures) Game evaluations, adjustments, reinforcement	20 Game review	21 2 games/ eval.
23 Game Review	24 2 GAMES, Conference Game evaluations	25 1 GAME, NON-Conference Game evaluations	26 Focus on district tournament preparations, relaxation/ imagery Evaluate	27 Tentative Pre-district game (*State Tournament) Measures for all teams	28
30	31	6/1	6/2	6/3	DIST. FINALS

*Some teams are drawn to have a qualifying game before the 27th. If any of the three teams are selected to play the qualifying game, measures will be on that day.

APPENDIX F

Psychological Tools

Goals

1. Dream Goal (long-term)—What is your long term goal?
   What is potentially possible in the long term if you stretch all your limits?

2. Dream Goal (this year)—What is your dream goal for this year?
   What is potentially possible if all your limits are stretched this year?

3. Realistic Performance Goal (this year)—What do you feel is a realistic performance goal that you can achieve this year(based on your present skill level, on your potential for improvement, and on your current motivation)?

4a. Goal of Self-Acceptance—Can you make a commitment to accept yourself and to learn from the experience regardless of whether you achieve your ultimate performance goal this year?

4b. If you do not meet your desired performance goal, to what extent will you still be able to accept yourself as a worthy human being?

Complete self-rejection	0	1	2	3	4	5	6	7	8	9	10	Complete and full self-acceptance

5. Can you set an on-site goal of best *effort* (giving everything you have that day) and be satisfied with achieving that single goal?

6. Focused Psychological Goal (this year)—What do you feel is an important goal for you to focus on this year in terms of your psychological preparation or mental control (e.g. a *specific* goal related to psychological readiness for the event, focus control within the event, distraction control, confidence, coping with hassles or setbacks, and improving interpersonal harmony or relationships)?

7. Daily Goal—(A) Set a personal goal for tomorrow's training session. Write down one thing you would like to do, or accomplish, or approach with special focus or intensity. (B) Can you set a personal goal before going to each training session this year?

8. What do you think others could do to increase the harmony among team members this year?

Competition Reflections

These questions are designed to help you reflect upon your personal competitive history and to help you develop or refine a precompetition plan and competition focus plan.

Knowing your competitive self

1. Think of your all-time best performance(s) and respond to the following questions keeping that event(s) in mind:

   How did you feel just before that event?

No Activation (mentally and physically flat)	0	1	2	3	4	5	6	7	8	9	10	Highly activated (mentally and physically charged)
Not worried or scared at all	0	1	2	3	4	5	6	7	8	9	10	Extremely worried or scared

2. What were you saying to yourself or thinking shortly before the start of the event(s)?

3. How were you focused during the event (i.e., what were you aware of or paying attention to while actively engaged in the performance)?

4. Now think of your worst competitive performance(s) and respond to the following questions keeping that event in mind:

   How did you feel before that event?

No activation (mentally and physically flat)	0	1	2	3	4	5	6	7	8	9	10	Highly activated (mentally and physically charged)
Not worried or scared at all	0	1	2	3	4	5	6	7	8	9	10	Extremely worried or scared

---

(Cont.)

5. What were you saying to yourself or thinking shortly before the start of that event?

6. How were you focused during the event (i.e., what were you aware of or paying attention to while actively engaged in the performance)?

7. What were the major differences between your thinking (or feelings) prior to these two performances (i.e., best and worst)?

8. What were the major differences in your focus of attention during these performances (i.e., best and not-so-best)?

9. How would you prefer to feel just before an important performance?

No activation (mentally and physically flat)	0	1	2	3	4	5	6	7	8	9	10	Highly activated (mentally and physically charged)
Not worried or scared at all	0	1	2	3	4	5	6	7	8	9	10	Extremely worried or scared

10. How would you prefer to focus your attention *during* an important performance?

11. Is there anything you would like to change about the way you approach a competition? or training?

12. Is there anything you would prefer to change about the way the coach approaches you during training or competitions?

Personal Precompetition Plan—Content

Decide what kinds of activities, thoughts, or images you will include in each category below. Draw upon what has worked for you in your best past performance and upon what you think will be most helpful or most appropriate for the upcoming competition(s).

General physical warm-up	General psychological warm-up	Preevent physical preparation	Preevent psychological preparation

Competition Evaluation—Form B

Name: ____________________ Event: ______________________________

Date: ____________________ Results: ______________________________

Event/Site ____________________ Your Placing: ______________________________

1. Did you have a performance outcome goal for this event?

2. If so, to what degree did you achieve this performance outcome goal?

Did not achieve goal at all	0 1 2 3 4 5 6 7 8 9 10	Achieved goal completely

3. What was your on-site goal(s) for this event (e.g., what focus did you want to carry into this event)?

4. To what degree did you achieve this on-site goal(s)?

Did not achieve goal at all	0 1 2 3 4 5 6 7 8 9 10	Achieved goal completely

5. Circle your feeling *going into this competition.*

No determination	0 1 2 3 4 5 6 7 8 9 10	Completely determined
No confidence	0 1 2 3 4 5 6 7 8 9 10	Completely confident
No worries	0 1 2 3 4 5 6 7 8 9 10	Very worried
No physical activation (flat)	0 1 2 3 4 5 6 7 8 9 10	Highly physically activated (positively charged

6. How did your precompetition plan go?

Terrible	0 1 2 3 4 5 6 7 8 9 10	Felt really good

Were you feeling the way you wanted to feel?

(Cont.)

Competition Evaluation Form B

7. What were your thoughts as you approached the start of the event?

8. How did your competition focus plan go?

Went poorly/ lack of focus/ off plan	0 1 2 3 4 5 6 7 8 9 10	Went really well/ completely focused/ followed plan

Comments (e.g., What was on, what was off, what needs work or adjustment?)

9. When you were going best, where was your focus?

10. Were you able to fully extend yourself during the event (how much did you push)?

Did not extend myself at all	0 1 2 3 4 5 6 7 8 9 10	Completely extended myself (to the limit)

11. Did you have occasion to draw upon a *refocusing plan* at any time of this competition (before, during, or after)?

Yes _________ No_________

If yes, comment briefly (e.g., were you able to call upon a plan, did it work?).

(Cont.)

12. Did you experience any communication or interpersonal problems surrounding this event?

    Yes ____________ No ___________

    If so comment briefly (i.e., What was the problem and were you able to deal with it adequately?).

APPENDIX G

Figure 1a. Post Game, Post Season Means for State Sport-Confidence Inventory

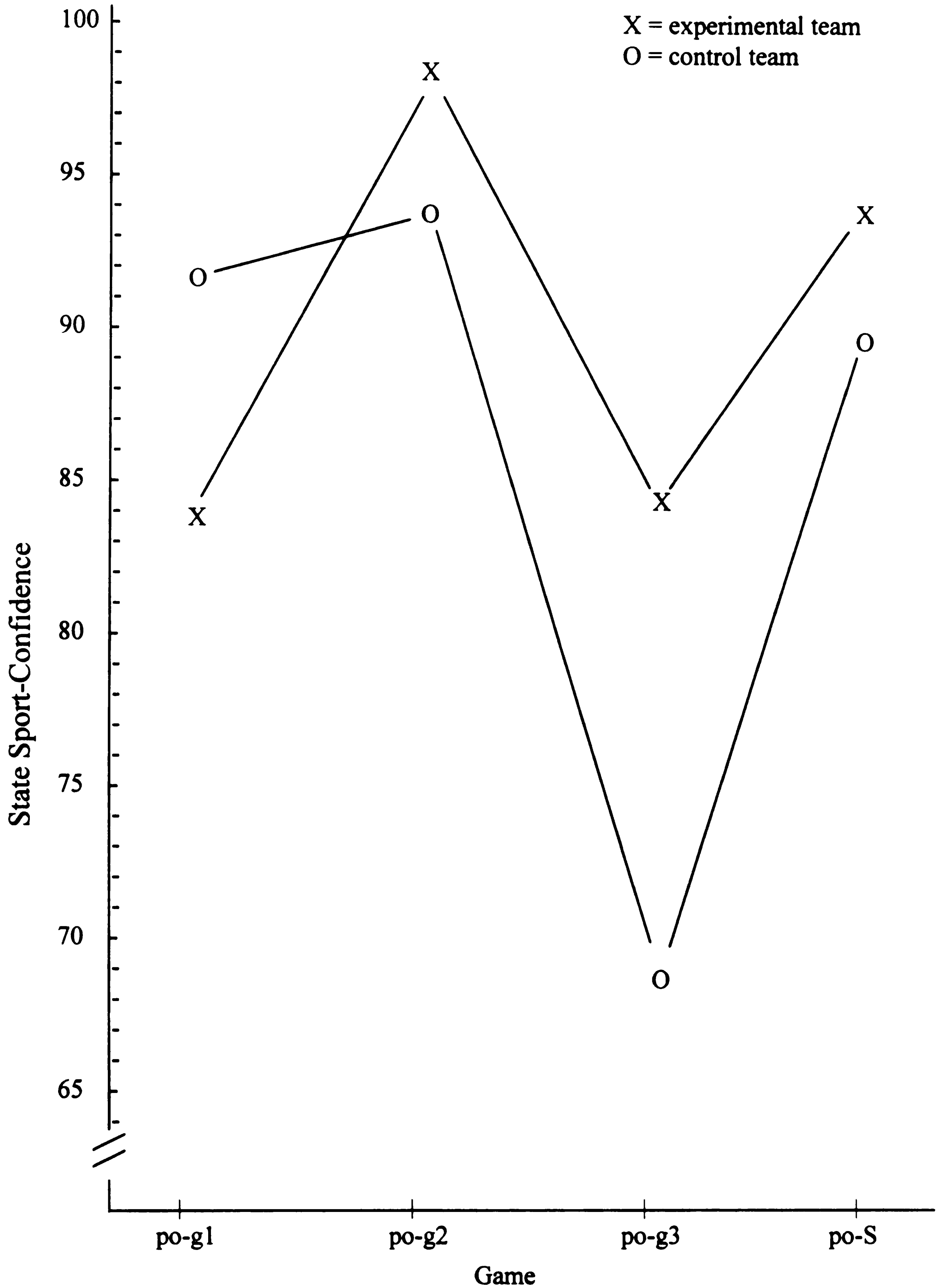

Figure 1a. Post Game, Post Season Means for State Sport-Confidence Inventory.

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