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THE CAUSAL INFLUENCES AND REDUCTION OF LEARNED HELPLESS DEFICITS IN ADOLESCENT ATHLETES

By

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ABSTRACT

THE CAUSAL INFLUENCES AND REDUCTION OF LEARNED HELPLESS DEFICITS IN ADOLESCENT ATHLETES

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A temporal model of learned helplessness (LH) was proposed and tested in the current experiment. Also, the research examined the effectiveness of a psychological skills training (PST) program designed to reduce LH deficits in adolescent tennis players. The model proposed that one's LH predicts one's self-efficacy and one's LH and self-efficacy together predict one's attributional style. Furthermore, the model proposed that previous attributional style predicts later LH and self-efficacy. Forty athletes (20 male and 20 female) were randomly placed in either a control or intervention group and taken through a 4 week program. The PST program included attribution retraining, imagery training, goal orientation training as well as guidance on how to monitor and change negative self-statements. The control group was given a program consisting of strength and endurance tasks only. Path analytic results showed the proposed model did not fit the data as well as the full model containing all recursive pathways. Results also showed that the intervention group significantly lowered levels of LH after 4 weeks compared to the control group.

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CHAPTER 1

INTRODUCTION

Failure is certainly a part of competitive sport participation and while all competitors have some trouble dealing with failure, young athletes usually have more problems in dealing with it. Young athletes, more often than adults, do not know how to accept failure and some, therefore, believing that they cannot control the outcome of the contest at all, simply stop trying. Maier, Seligman and Solomon (1969) termed this situation "learned helplessness" (LH). LH is the belief that "you have no control over negative events," (p. 2) and results from, in part, the inappropriate attributions made after failure situations (Dweck, 1979).

Attribution and LH research have, in the past, focused primarily on subjects outside the realm of sport. This research has shown that LH children (Ames, 1984; Diener & Dweck, 1978; Dweck & Repucci, 1973; Fowler & Peterson, 1981) and LH college students (Alloy, Peterson, Abramson & Seligman, 1984; Klein, Fencil-Morse & Seligman, 1976; McAuley & Duncan, 1989) attribute outcomes to factors that cannot be personally controlled. In addition, in reciprocal fashion, those who attribute failure to ability or luck are less likely to persist after failure and more likely to show tendencies of LH (Dweck, 1975; Fowler & Peterson, 1981). Similarly, Abramson, Seligman and Teasdale (1978) assessed not only locus of control, as in previous studies, but also stability (how consistently an outcome occurs) and generality (in

how many different situations an outcome occurs) in an attempt to more accurately assess one's attributions in predicting LH. They found that adults (Alloy et al., 1984) and children (Nolen-Hoeksema, Girgus & Seligman, 1986) who have persistence problems typically made attributions to failure that were internal, stable and global. Conversely, mastery-oriented subjects with no persistence problems made attributions to failure that were external, unstable and specific to the failure situation.

Recently, Prapavessis and Carron (1988) studied elite youth tennis players and found that LH not only existed at elite levels of youth competition but that the characteristics of LH at this age level mirrored those suggested by Abramson et al. (1978). LH was increased when athletes attributed failure to causes that were internal, stable and general (i.e., ability). Conversely, attributions to causes that were external, unstable and specific (i.e., task difficulty) minimized LH.

Most researchers of LH alleviation use a cognitive restructuring intervention called attribution retraining. Subjects are taught to identify and modify irrational self-statements that tend to produce high stress reactions because they generate unrealistic and unachievable expectations. Past LH intervention research in laboratory settings has consistently emphasized using the internal attribution of lack of effort (Dweck, 1975; Fowler & Peterson, 1981; Miller & Norman, 1981) or the external attribution of high task difficulty (Klein et al., 1976) to explain failure.

Both were found more effective than attributing failure to lack of ability or bad luck.

Attribution retraining research has not been published in the area of sport. This may be primarily due to the concern over an unrealistic emphasis on effort. If an athlete is trying hard but fails, attributional advice to give more effort would obviously be inappropriate. However, as Halliwell (1979) noted, attribution retraining should not just be the teaching of effort attributions. Rather, it should be the training of whatever adaptive strategy is relevant for the particular situation, preventing the athlete from attributing failure to lack of ability. For instance, reminding the athlete to focus specifically on controlling the eyes between points in tennis (to maintain attentional focus) would be an example of an adaptive strategy. The logic is that because one cannot do anything during a match about one's lack of ability, one might as well concentrate on something one can control. Persuading the athlete to focus on controllable strategies is one way to structure attribution retraining in sport settings. Whether adaptive attributions can be taught to youth sport athletes, and what effect these attributions will have on LH, remain to be answered.

Besides attributions, another potential influence on LH is self-efficacy. Bandura (1977) defined self-efficacy as judgments about what one can do with whatever skills one possesses. Hinting at a relationship between self-efficacy and attributions in his first paper, Bandura noted that the way in which subjects cognitively process

information can influence the relationship between self-efficacy and performance. For example, failures are less likely to reduce self-efficacy if attributions for those failures are based on poor effort or other controllable factors instead of one's ability. Later, Bandura (1986) proposed that "self-efficacy is both a determiner of causal attributions and a mediator of their effects on performance" (p. 402). Furthermore, because one's self-efficacy can be increased by coping skills, even when the person has undergone many experiences confirming his/her inefficacy (Bandura, 1977; Bandura, Reese & Adams, 1982), one might presume self-efficacy also mediates the effects of coping skills on performance. Therefore, if an activity is personally valued, a negative relationship should exist between one's self-efficacy and LH for that activity.

While family influences usually play a critical role in child and adolescent development, very little has been mentioned in the literature about the potential influence of the family on LH. One exception is Peterson and Bossio's (1991) book on the effects of optimism on health. It seems quite possible that such factors as divorce, death of a parent, inconsistency in childrearing, modeling of optimism or pessimism, and pressure from parents to succeed may affect LH formation. Divorce is often an event that raises doubts in the mind of the child about personal worth and control of negative outcomes. A parent's inconsistency in childrearing reinforces the notion that actions have nothing to do with outcomes. Modeling of optimism, on the other hand, may provide an excellent opportunity for vicarious learning about life

issues. As can be seen, each of these issues is closely related to one's self-efficacy and beliefs about controllability. Because of their potential influence, questions pertaining to familial issues are included in the background questionnaire.

Some light has been shed on the importance of psychological skills to performance. The research in this area has supported the use of proximal (Bandura, 1986) and task oriented (Ames, 1984) goal setting, progressive relaxation (Altmaier & Happ, 1985; Meichenbaum, 1977), visualization (Feltz & Landers, 1983; Martens, 1982) and positive self-talk (Diener & Dweck, 1978; Van Noord, 1984) for enhancing performance. However, little is known of the specific effects of these skills on self-efficacy and persistence when used together in a psychological skills training program. Despite all the research in the areas of attribution theory, self-efficacy, and LH, no model has been proposed showing how these variables are related to each other.

In the present study, a temporal model of the relationships among LH, self-efficacy (SE) and attributions is proposed (see Figure 1). LH is operationalized in the present study as lack of persistence (LHA) and maladaptive perceptions of failure (LHB). The model consists of three phases, a pretest, midtest, and posttest and two waves of path relationships. The model suggests that, within each phase, one's LH is a predictor of one's self-efficacy, and one's LH and self-efficacy together predict one's attributional style. In addition, it is suggested that one's previous attributional style will be a strong predictor of subsequent LH, as well as subsequent self-efficacy. Furthermore, this model tests the reciprocal relationships

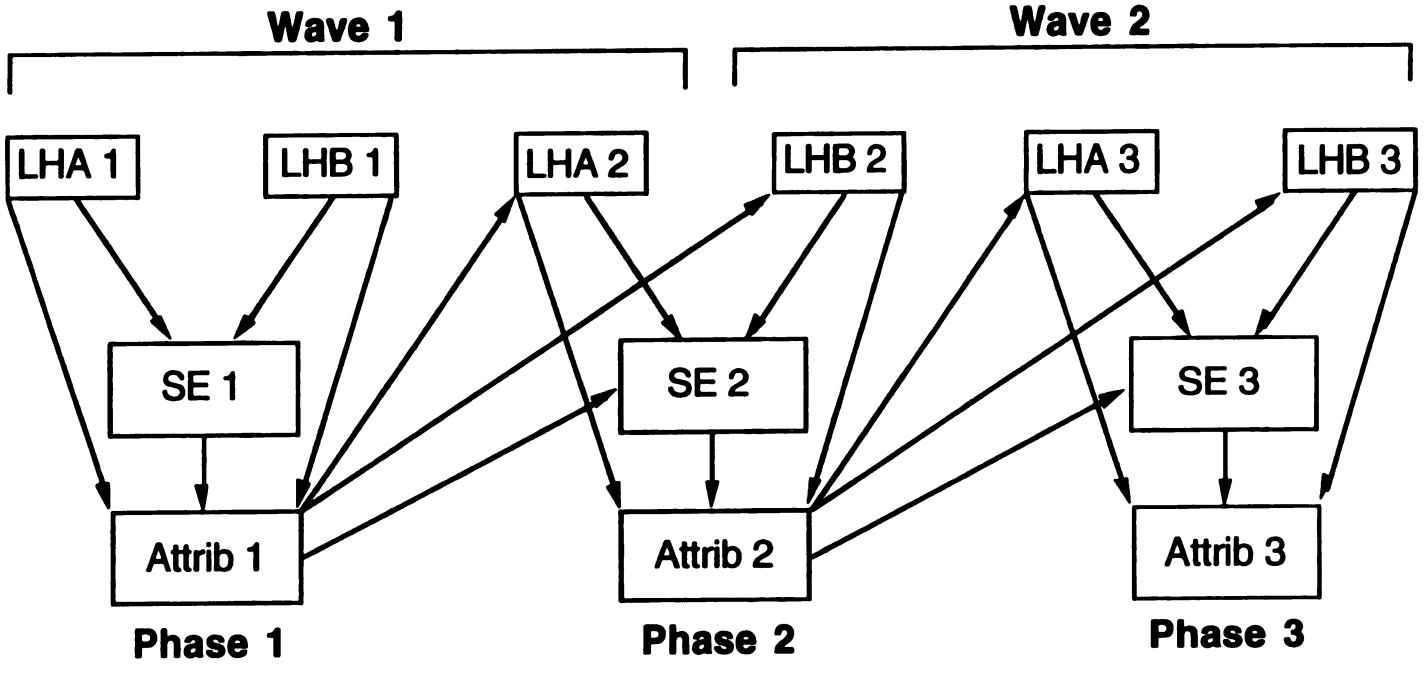

Figure 1: Proposed Temporal Model of Learned Helplessness

between self-efficacy and attributional style that were proposed by Bandura (1986). This model will be tested against a full model containing all logical recursive pathways (Figure 2). Only first-order dependence was considered in structuring the full model. This means that direct paths were not drawn across waves, such as from Attribution1 to LHA 3 and LHB3.

One area within the sport milieu that would provide an ideal place to investigate the relationships among self-efficacy, attributions and LH is youth sports. As stated earlier, young athletes often have problems with interpreting failure and are more apt to suffer from LH. Problems such as these may be particularly evident in those sports that involve the professionalization of preadolescent and adolescent athletes. Based on the trend over the past several decades of decreasing average age of the professional tennis player, many athletes and coaches believe that to be a successful world class player, the athlete must become dedicated to the sport at a very early age. The younger the age, the more ill-equipped the child may be to analyze a failure situation and adaptively "place the blame."

Furthermore, many individual sports lend themselves to a very high amount of failure. Tennis is a sport that involves a great deal of failure, no matter how successful one is. Tennis also requires a large financial investment to compete and the importance of success is often highly elevated by parents and coaches. Because of this investment, the parents of those athletes who become LH often do not allow their

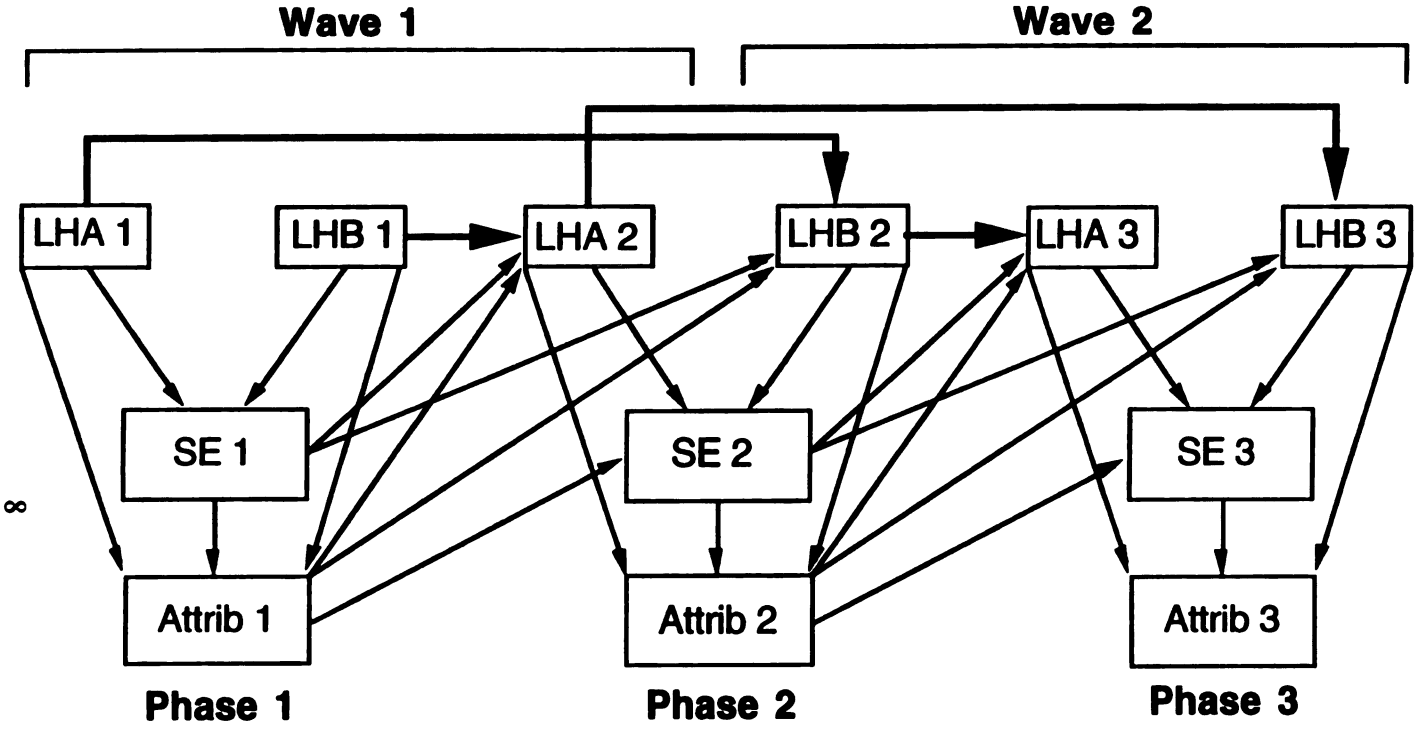

Figure 2: The Full Recursive Model of Learned Helplessness

children to quit. Subsequently, "elite" LH athletes are produced, continue to compete, and continue to perform poorly at each performance level.

Also, as Dweck (1979) pointed out, it is just as likely for elite athletes to become learned helpless as non-elite athletes. An elite athlete can have maladaptive attributions, but because of less skilled opponents or a high level of personal athletic ability, he or she may not have experienced many failure situations. By the time such a person experiences failure, he or she could have very advanced physical skills but virtually no coping skills.

A program designed to detect and reduce LH among adolescent athletes would have far reaching effects. Without LH, sport participants would be more content as competitors because they would have a more adaptive outlook and know how to handle failure. With persistence comes the opportunity to learn from mistakes, to improve and to continue enjoying competition. Furthermore, coaches would be more satisfied if the athletes appeared happier, since enjoyment often translates into better performances and a better overall sport experience.

Purpose of the Study

The purpose of the present research is to test a causal model of LH with young athletes, and then to reduce LH using an intervention program consisting of psychological skills and a cognitive restructuring technique called attribution retraining. The LH of elite and non-elite adolescent tennis players was assessed by measuring its relationship to self-efficacy beliefs about the tennis serve and

attributional style. A psychological skills training (PST) program along with attribution retraining was then implemented over a 4-week period (with assessments measured at two week intervals) to reduce LH.

Research Hypotheses

The research hypotheses for the current research are presented below:

1. The higher an athlete scores on LHA (serve persistence), the higher will be the athlete's self-efficacy beliefs for the tennis serve.
2. The higher an athlete scores on LHA, the more the athlete will utilize adaptive attributions.
3. The higher an athlete scores on LHB (representing adaptive perceptions of failure), the more the athlete will utilize adaptive attributions.
4. Within each of the three phases, LH (as measured by serve persistence and maladaptive perceptions of failure) will predict self-efficacy.
5. Within each of the three phases, LH and self-efficacy together will predict attributional style.

6a. Within each of the two waves, attributional style will predict serve persistence (LHA).

6b. Within each of the two waves, attributional style will predict maladaptive perceptions of failure (LHB).

7. Within each of the two waves, attributional style will predict self-efficacy.
8. The proposed LH model will fit the data better than the full model containing all recursive pathways.

9a. The level of serve persistence of athletes will be higher after 4 weeks of PST intervention.

9b. The level of maladaptive perceptions of failure will be lower after 4 weeks of PST intervention.

10. Serving self-efficacy will be higher after 4 weeks of PST intervention.
11. The attributional style of athletes will be more adaptive after 4 weeks of PST intervention.

Delimitation

The generalizability of the results of this research will be limited to a population of adolescent tennis players similar to the sample.

Basic Assumptions

This research was predicated on the following assumptions:

3. There are adolescent tennis players who have some degree of LH.
4. Adolescent tennis players who have learned helplessness (low persistence in the face of failure and a maladaptive achievement pattern) do not like the associated feelings of depressed affect and low self-confidence and will work to overcome those deficits.

5. Interested coaches are able to learn and reinforce in the subjects the basic psychological skills used in the intervention.
6. The proposed LH model is recursive, that is, the causal flow is unidirectional.
7. The relations among the variables in the path model are linear, additive and causal.
8. Path analysis is based on the assumption that the variables in the model are measured without error.

Definitions of Terms

Learned Helplessness (LH): LH is characterized by the perception that one has no control over the occurrence of a negative outcome and is accompanied by a lack of persistence in the face of failure. Such perceptions are thought to originate from the attribution of failure to stable, internal and global events, such as one's athletic ability, or external and unstable events, such as luck. Because athletic ability and luck cannot be controlled and it is this control that affects one's expectancy for success, when failure begins to occur, the task is perceived as insurmountable. In the current research, the LH variable was measured using the tennis serve persistence test (TSP - developed for this research) and the maladaptive achievement pattern questionnaire (MAPQ - Prapavessis & Carron, 1988).

Learned Helpless Deficits: Four deficits have been identified as outcomes of LH. The first deficit is cognitive in nature since there is an expectation of future

noncontingency between effort and outcome. The second deficit is a consequence of the cognitive noncontingency belief, and involves a motivational retardation since initiation of voluntary response is reduced. The third deficit is emotional in nature and involves a depressed affect due to learning that outcomes are uncontrollable (noncontingency). The last deficit involves a reduction of self-esteem due to a combination of the first three deficits (belief in noncontingency, reduced motivation and depressed affect) (Abramson et al., 1978).

Psychological Skills Training (PST): A program of specific psychological skills designed to enhance the performance of the individual for whom it is developed. The program used in the current research involved attribution and self-talk retraining, visual imagery, and goal orientation training. These skills were taught in a group situation, practiced at home and reinforced during on-court practice.

Self-Efficacy: A term used by Bandura (1977) to refer to the judgments one has about what one can do with whatever skills one possesses. Self-efficacy refers to the belief one has about executing a specific skill rather than a global trait.

Limitations

The primary limitation of this research was the non-random manner by which the athletes were chosen. Basically, the program director who agreed to participate was included as long as his program met the minimum requirements as outlined in the "Procedures" section. There was no random sampling done in this investigation. Finally, because the athletes could not realistically be observed every moment of the

day, some may not have followed their PST programs. It was hoped that through the efforts of the primary investigator and the coaches, as well as the use of daily monitoring charts and a manipulation check, the athletes understood the importance of learning the psychological skills associated with reducing LH deficits.

Chapter 2

LITERATURE REVIEW

When a person has a history of noncontingent aversive stimulation which leads to an impairment in acquisition of instrumental performance, that person is said to be learned helpless (Altmaier & Happ, 1985). This relationship was first established by Overmier and Seligman (1967) and Seligman and Maier (1967) with dogs, and then later by Hiroto (1974) with humans. In the Seligman experiments, a group of dogs received shocks that they could neither avoid nor escape. These dogs later showed marked deficits when the opportunity to escape shock was provided. In contrast, dogs with no inescapable shock experience quickly learned to escape shock by simply jumping over the barrier.

Hiroto (1974) found the same effect with humans. He assigned college students to one of three groups: controllable noise, uncontrollable noise and no noise. The task involved pressing a button in an attempt to turn the noise off. After multiple trials in their particular experimental group, all subjects were put in a controllable situation where the noise could be terminated by pulling a lever. Similar to the dogs, the group that received uncontrollable noise in the first test sat passively and listened to the noise while the controllable and no noise groups quickly learned to terminate the noise.

As a result of the research related to the effects of uncontrollable outcomes on the formulation of LH in humans (e.g., Fosco & Geer, 1971; Glass & Singer,

1972; Hiroto, 1974; Hiroto & Seligman, 1975; Klein & Seligman, 1976; Maier & Seligman, 1976; Miller & Seligman, 1975), four types of deficits have been found to exist: motivational, cognitive, emotional and self-esteem. LH deficits have been found to be cognitive in nature because subjects who have been exposed to uncontrollable outcomes have learned to expect that future outcomes will also be uncontrollable. Also, learning that outcomes are uncontrollable makes it more difficult to later learn which responses produce desired outcomes. Motivational deficits have been observed in subjects whose initiation of voluntary response becomes retarded as a consequence of the expectation that outcomes will be uncontrollable. Research also suggests that a depressed affect is a common consequence of learning that outcomes are uncontrollable. People who accept the notion that outcomes are uncontrollable often become complacent, sad and dejected. Last, when people compare their inability to control the outcome of an event to others who appear to be having more success at controlling outcomes, self-esteem has been shown to decrease.

Since those early experiments, many more important articles have been published regarding the effects of uncontrollable events on performance and how deficits could be prevented. This chapter provides an overview of this research. The first section describes the reformulation of LH. The next section reviews the potential causes of LH, the attribution-LH relationship with children, college students and in sport, the self-efficacy-LH relationship, and techniques for the reduction of LH deficits.

The Learned Helplessness Reformulation

Abramson et al. (1978) suggested that to better predict LH, there needed to be a reformulation of the existing LH theory. Abramson and her colleagues' reformulation involved assessing not only locus of control (internal versus external) but also stability (how consistently an outcome occurs) and generality (in how many different situations an outcome occurs).

The original LH theory (Maier, Seligman & Solomon, 1969) had several important inadequacies that were resolved by Abramson et al. (1978) First, the old theory did not specify when a person who believes outcomes to be uncontrollable will demonstrate the deficits, nor did it detail the chronicity of those deficits. A dimension of generality was added because helpless deficits could be general and apply to many situations (e.g. "I can't play this game.") or be situation specific (e.g. "I can't play this game with you."). Further, a stability dimension was added to the generality and internality dimensions to cover those circumstances that are stable (e.g. "My skills are superior to my opponent's.") and unstable (e.g. "He was very fortunate to win today."). The resultant flow of events leading to LH involves the individual first perceiving that certain outcomes and responses are independent, then making an attribution about the cause (stable or unstable, global or specific, and internal or external) which affects the expectations about future responses, all of which determines whether future helplessness will be chronic or acute, broad or narrow, and whether self-esteem will be raised or lowered.

The second inadequacy of the original LH hypothesis stemmed from the fact that no distinction was made between cases in which outcomes were uncontrollable for all people and cases in which they were uncontrollable for only some people. Because in both cases the subject became helpless, no preference was given to attributing to lack of ability or task difficulty. However, by specifying whether one was personally or universally helpless, a more detailed assessment was possible regarding the severity of the particular attribution used. Personal helplessness involves a low efficacy expectation coupled with a high outcome expectation; whereas universal helplessness involves only a low outcome expectation because no response produces the outcome. Universally helpless individuals make external attributions for failure and are typically temporary, whereas personally helpless individuals make internal attributions for failure which are often pervasive and more debilitating in nature.

Potential Causes of LH

Helplessness is said to exist when a person shows motivational and cognitive deficits as a consequence of an expectation of uncontrollability (Abramson et al., 1978). Abramson et al. presented the likely events that lead to symptoms of helplessness by proposing that the flow of events begins with objective noncontingency (performance did not improve no matter what the athlete tried to do) and leads to a perception of present or past noncontingency (the athlete believes he/she can do nothing to change the outcome), an attribution for present or past

noncontingency (the athlete makes an uncontrollable attribution such as he/she has low ability), an expectation of future noncontingency (athlete believes he/she will not be able to control future related events) and finally symptoms of helplessness (lack of motivation and persistence).

Research on the attributional causes of LH has, in the past, focused primarily on children and college students. This research has shown that LH children and college students attribute outcomes to factors that cannot be personally controlled. In other words, those who attribute failure to ability or luck are less likely to persist after failure than those who attribute failure to lack of effort or high task difficulty.

The Attribution - LH Relationship With Children

The line of research Dweck and her colleagues initiated supports the contention that persistence after failure is more likely to occur when attributions are related to lack of effort rather than bad luck. Dweck and Repucci (1973) studied the effect of attributing failure to self versus other causes. They found that children with the lowest performance either did not attribute failure to themselves or if they did, they attributed it to uncontrollable factors (ability). Those who were most successful attributed failure to lack of effort instead of ability.

Dweck's (1975) experiment further assessed the importance of effort attributions by seeing whether changing attributions for failure would allow LH children to more effectively deal with problem solving failure situations. Dweck assigned subjects to either an effort attributions group (subjects taught to take

responsibility for failure outcome) or a success only group. Dweck found that the effort attributions group persisted longer in the face of failure than the success only group.

Diener and Dweck (1978) supported Dweck's findings by showing that helpless children made the expected attributions for failure to lack of ability while mastery oriented children made surprisingly few attributions and instead engaged in self-monitoring and self-instruction behaviors. Diener and Dweck further found that helpless children focused on the cause of the failure while highly persistent mastery oriented children focused on remedies for failure. Similar findings with regard to effort and persistence were also presented by Diener and Dweck (1980) and Fowler & Peterson (1981).

Ames (1984) extended the work of Dweck (1975) and Diener and Dweck (1978, 1980) by attempting to assess the role of situational factors in the formulation of attributions, and hence LH. Results revealed that children made more ability attributions in a competitive than in an individual situation. These results supported the use of task-related goals instead of outcome goals to increase effort attributions and decrease LH.

In summary, there is substantial evidence to support teaching effort attributions to children in an attempt to increase their persistence in the face of failure. This research also supports the use of attribution retraining and a task-related goal orientation with children to increase adaptive attributions and intrinsic motivation respectively.

The Attribution - LH Relationship With College Students

Research on the effects of attributions on LH with college students has focused on the dimension of globality. Subjects who learn to attribute failure to factors that are pervasive across all situations (e.g. lack of ability or a general lack of good fortune) experience problem solving performance decrements, decreased persistence, and a tendency to become helpless in similar and dissimilar situations. Klein et al. (1976) found that nondepressed groups persisted longer than depressed groups, and solvable and control groups persisted longer than unsolvable groups when they gave depressed and nondepressed college students experience with solvable, unsolvable, or no discrimination problems. However, when depressed subjects attributed their failure of high task difficulty instead of their own incompetence, performance improved significantly.

In an attempt to discover the effects of type of situation on attributions, Tennen and Eller (1977) tested whether failure on easy tasks elicited attributions of lack of ability and failure on hard tasks produced attributions of high task difficulty. College age subjects were given solvable discrimination problems that were labeled either progressively easier or progressively harder. Results showed that instructions suggesting a difficult task increased persistence in the face of failure. Furthermore, attributions of lack of ability produced deficits; whereas, attributions of high task difficulty resulted in facilitation of problem solving. Tennen and Eller

concluded that the external, unstable attribution of high task difficulty facilitated later problem solving because it was too specific to produce an expectation of noncontingency between outcome and response.

Alloy et al. (1984) supported the previous research on children that espoused the importance of attributing failure to lack of effort or high task difficulty (specific factors). College students who had either a global or specific attributional style were given one of three pretreatments: controllable noise, uncontrollable noise or no noise. Subjects who attributed globally became helpless in similar and dissimilar situations; whereas, subjects who attributed failure to specific factors became helpless only under similar situations.

This research with college students demonstrates the importance of applying adaptive attributions to failure situations. When failure attributions are situation specific, subjects have demonstrated increased persistence and problem solving behaviors, as well as a reduced occurrence of LH deficits. The research summarized thus far has involved child- and college-age subjects. No research was found that assessed attributional effectiveness with adolescents.

The Attribution - LH Relationship in Sport

In her paper to the International Congress of Physical Education, Dweck (1979) discussed the importance of attribution and LH research in sport. Because sports are highly competitive, skilled activities which are often public in nature, Dweck noted that people who have a tendency toward LH (focus on their ability,

fear failure and believe failure is a display of lack of ability) should not be found participating. However, LH participants are indeed found at every competitive level in sport. Dweck's explanation was that just because one is highly skilled at a sport does not mean he or she can cope with failure effectively. Athletes who do not have coping skills and adaptive attributions must try to steer clear of failure situations, but when they occasionally occur, regardless of ability level, persistence is often terminated prematurely. Dweck concluded by noting that lack of confidence may play a vital role in the formation of LH tendencies by reducing motivation and hence time spent on task.

Rejeski and Brawley (1983) presented a summary of the status of attributional research in the area of sport. Among the information presented were criticisms and suggestions for future research. Rejeski and Brawley noted that sport attribution research has been conducted primarily with university students using novel tasks that were not ego involving and hence not generalizable to competitive sport. Also, few were experimental in nature and many measured sport teams with no attention to age or educational level of participant. Furthermore, the subjects were not even randomly assigned to research groups. Based on these criticisms, Rejeski and Brawley suggested future attribution research in sport should be more experimental in nature, involve children and adolescents, use ego involving tasks more closely related to sport specific skills, and pay more attention to the demographics of the subjects.

Although Seligman's attributional research in sport was not experimental, it did show that maladaptive attributions after failure outcomes can have a negative effect on the subsequent performance of elite athletes (Seligman, Nolen-Hoeksema, Thornton & Thornton, 1990). Seligman and his colleagues' work with professional baseball and basketball players employed the "Content Analysis of Verbatim Explanations" (CAVE) technique which involves the classification of verbal causal statements on a 1 to 7 scale for internality, stability and globality. Seligman et al. used this CAVE technique to summarize "every sports-page quote including causal statement for each individual on a team" (p. 157) for the entire professional baseball season. In this manner, individual, team and managerial explanatory styles were computed. Regarding the validity of this data collection technique, Seligman had this to say:

> We don't have the clout or the resources to interview all the leading baseball players ourselves. So we rely on what is reported in the sports pages of hometown newspapers and in the marvelous goldmine, Sporting News. Now, what a player says to a reporter is pretty degraded scientific material. The quote itself may be inaccurate, hyped by the reporter to make more exciting copy. The player may not say what he means. He may try to shift or take on the blame. He may try to be overmodest or overmacho for the sake of appearances. So we don't know if the quotes accurately reflect explanatory style. The only way is to "bootstrap": If the study does accurately predict how a team goes on to do, the quotes must have had validity. If it doesn't predict, either the theory is wrong or the quotes are not valid indicators of underlying optimism (p. 157).

Seligman et al. predicted that the more optimistic teams (which attributed failure to external, unstable and specific causes) would not only do better overall but perform better in the latter parts of each game. If the team had a pessimistic

explanatory style (attributed failure to internal, unstable and specific causes), then it would have to be extremely talented to be at all successful. Last, an optimistic team was predicted to do better and a pessimistic team worse in the following year.

To test these hypotheses, they compared the team explanatory style scores for several years, correcting for personnel changes and how well the teams did in the previous year. The hypotheses held in all cases.

> Statistically, in 1986, optimistic teams bettered their 1985 win-loss records, and pessimistic teams did worse then they had done in 1985. Teams optimistic in 1985 hit well under pressure in 1986, whereas the hitting of teams pessimistic in 1985 fell apart under pressure in 1986, compared to how well both kinds of teams normally hit (Seligman et al., 1990, p. 160).

The researchers then replicated the entire study again for the 1986 and 1987 seasons and found supporting results. Also, between the years of 1982 and 1985, Seligman et al. found similar results for professional basketball. Overall, they made the following conclusions: (a) success on the playing field is predicted by optimism; (b) failure on the playing field is predicted by pessimism; and (c) explanatory style works by means of how a team does under pressure, after a loss or in late innings of close games.

To investigate the learned helplessness of elite adolescent athletes, Prapavessis and Carron (1988) followed some of the recommendations of Rejeski and Brawley (1983) and assessed the effects of gender and skill level on the attributional style and level of LH of 50 elite youth sport tennis players. They found that there was no relationship between gender or skill level on attributional style or

LH tendencies. However, their findings supported the Seligman et al. (1990) findings, that elite adolescent athletes can have debilitating attributional styles to the point of being labeled LH (about 20% of the tennis players were LH) and, they mirrored the results suggested by Abramson et al. (1978). Prapavessis and Carron found that the severity of LH deficits were greatly increased when athletes attributed failure to causes that were internal, stable and global. Conversely, attributions to causes that were external, unstable and specific minimized LH deficits. Prapavessis and Carron's (1988) findings were also consistent with Dweck and Repucci (1973), Tennen and Eller (1977), and Miller and Norman (1981), among many others. The main purpose of Prapavessis and Carron's research was simply to identify the existence of LH deficits in elite adolescent athletes. While Prapavessis and Carron made recommendations for the application of their results, they did not attempt to reduce the LH deficits that they found in their study.

Self-Efficacy and LH

Besides attributions, another potential influence on LH is self-efficacy. Bandura (1977, 1986) developed a social cognitive theory of self-efficacy to explain how efficacy expectations were mediators of people's motivation and behavior. Bandura's theory proposed that efficacy expectations are derived from four informational sources: performance accomplishments, vicarious experiences, verbal persuasion and physiological states. Past performance accomplishments are regarded as the most dependable source of efficacy information since they are based on personal mastery experiences. Efficacy expectations are then said to

predict behavior, thought patterns and emotional reactions. Other factors that combine with the above mentioned sources of efficacy information to affect efficacy expectations include the perceived difficulty of the task, the amount of guidance received, the amount of effort expended and the temporal patterns of success and failure (Bandura, 1982).

Bandura (1986) proposed that, "self efficacy is both a determiner of causal attributions and a mediator of their effects on performance" (p. 402). Furthermore, since one's self-efficacy can be increased by coping skills, even when the person has undergone many experiences confirming his/her inefficacy (Bandura, 1977; Bandura et al., 1982), one might presume self-efficacy also mediates the effectiveness of coping skills on performance. Therefore, if an activity is personally valued, a negative relationship is predicted to exist between self-efficacy and learned helplessness. However, self-efficacy is a significant determinant of behavior only when proper incentives and skills are present. Bandura (1977) presented his thoughts on the relationship between self-efficacy and LH:

> Theorizing and experimentation on learned helplessness might well consider the conceptual distinction between efficacy and outcome expectations. People can give up trying because they lack a sense of efficacy in achieving the required behavior, or they may be assured of their capabilities but give up because they expect their behavior to have no effect on an unresponsive environment or to be consistently punished. These two separable expectancy sources of futility have quite different antecedents and remedial implications. To alter efficacy-based futility requires the development of competencies and expectations of personal effectiveness. By contrast, to change outcome-based futility necessitates changes in prevailing environmental contingencies that restore the instrumental value of the competencies that people already possess (pp. 204-205).

Although there has been some theorizing about self-efficacy and LH, no testing of this relationship has been conducted. Most of the research on self-efficacy in sport has focused on its relationship to performance. In Feltz' (1988) summary of the research supporting a relationship between self-confidence and athletic performance, she noted that there is overwhelming support for the positive relationship between self-efficacy (task specific self-confidence) and athletic performance. Feltz (1988) presented some 28 studies offering correlational support for this relationship as well as four others which established a causal relationship (Feltz, 1982; Feltz, 1989; Feltz & Mugno, 1983; and McAuley, 1985).

According to Bandura (1977), efficacy expectations affect the amount of effort expended as well as the amount of persistence in the face of failure. Therefore, enhancing efficacy expectations should play a vital role in the reduction of LH deficits. To enhance efficacy expectations, Feltz noted that sport researchers (Feltz, Landers & Raeder, 1979; Feltz & Mugno, 1983; McAuley, 1985) have used primarily performance based information, but have also found that the other three sources of efficacy information are effective as well (Gould & Weiss, 1981). Among the many techniques used to supply efficacy information, imagery (Feltz, Marcotullio & Fitzgerald, 1985) and positive self-talk (Weinberg, 1986; Wilkes & Summers, 1984) are two that have been used with some success. Specific techniques for self-efficacy enhancement have included insuring performance success, gradual removal of physical guidance, modeling techniques that involve similar or symbolic

models, encouragement, anxiety reduction, visualization. cognitive restructuring and goal setting. Feltz suggested using more variable conditions instead of laboratory or simple closed skill activities to further test the relationship between efficacy expectations and performance. Because LH deficits are strong predictors of subsequent performance (since lack of effort, reduced persistence and a depressed affect have a negative effect on performance), the self-efficacy performance relationship should be intimately related to the occurrence of LH.

In the chapter up to this point, the theoretical research regarding the causes of LH deficits have been presented. In short, the LH reformulation by Abramson et al. (1978) provided the theoretical direction needed for researchers to undertake a systematic assessment of LH deficits among various populations. While extensive research has been conducted with children and adults, there is a noticeable absence of experimental research with adolescents and within the area of competitive sport. The remaining sections of this chapter are characterized as more applied, relating to LH intervention issues.

Reduction of LH Deficits

By the very nature of its name, learned helplessness is learned. Because of this fact, many believe LH can be reduced by teaching coping skills designed to increase persistence, effort and self-efficacy. One way practitioners enhance teaching effectiveness is to design and implement a systematic program of these performance enhancing skills.

Psychological Skills Training Programs

For one to perform consistently at competitive sports, one must be fit, know how to stay injury free, and possess the requisite physical and mental skills. For years, people believed that only the physical and fitness skills of sport could be systematically taught to athletes. In the past 20 to 30 years, the area of applied sport psychology has established guidelines by which psychological skills could be taught. The most effective psychological skills training programs (PST) have been sport specific and designed to match the developmental level of the athletes. However, as Williams (1986) noted, there is little consensus regarding which skills should be incorporated into a PST program or how those skills should be taught, even between the experts of a given sport.

Since definitive research on PST programs was lacking, common sense, research on the effectiveness of individual skills, and logical argument had to be the methods used to develop the PST program for the current research. Since subjects were in their early adolescence, had fairly average tennis-related aspirations and were asked to practice some of their psychological skills at home, the total number of skills used in the PST program was kept to a minimum. As discussed earlier, since LH deficits involve an outcome orientation, improper use of attributions, and low self-efficacy, the psychological skills chosen were task-related goal orientation, adaptive attributions and self-talk, and visualization. Williams (1986) expressed her conclusions regarding the potential effectiveness of a well designed PST program:

> If beginning athletes are taught to set realistic goals, increase self-confidence, visualize success, react constructively to mistakes and failure, and handle the pressure of competition, surely we can expect their performance and personal development to progress faster than the performance and development of athletes who fail to receive similar mental training (p. 302).

The PST program in the current research was designed using skills that have been empirically tested in the sport domain and found to be effective performance enhancers. This empirical support is summarized below.

Goal Orientation Training

Motivation has been studied in many fields and under a wide variety of circumstances. Researchers have defined motivation as the cause of goal oriented activity (Atkinson, 1964; Hull, 1943; Veroff, 1969). Achievement motivation involves a particular class of competence-related goals. The term goal orientation arose from research on achievement motivation and focuses on the motivational processes associated with various types of goals and the conditions that elicit them. There are two basic goal orientations which have been called various things in the literature. Maehr (1983), Maehr and Nichols (1980) and Nichols (1984) described these goal orientations as task involved and ego involved; Dweck (1986, 1988) named them learning oriented and performance oriented; and Ames (1984) called these perspectives mastery and ability focused, respectively.

The first orientation (task, learning, mastery) is related to developing new skills. Because the process of learning is what is valued, effort is viewed as a vital component. Conversely, the second orientation (ego, performance, ability) deals

with outcomes and how one is judged. Defeating others and achieving success is what is valued and therefore one's ability is the determining factor. There has been overwhelming support in the literature for the use of the first orientation in any achievement related situation.

Ames and Archer (1988) assessed the goal orientation, use of effective learning strategies, and causal attributions of adolescent students. They found that those who used a mastery goal orientation reported using effective strategies in failure situations, enjoyed challenging tasks, were more positive and optimistic about school and believed that success was closely related to their effort. However, those who used an ability goal orientation reported focusing more on their ability and blamed their lack of ability after failure situations. Ames and Archer strongly suggested teaching classroom students a mastery goal orientation. These results are supported by a huge body of goal orientation research (cf., Ames, 1984; Ames, Ames & Felker, 1977; Covington & Omelich, 1984; Dweck, 1986; Elliott & Dweck, 1985, 1988; Leggett, 1986; and Nichols, 1984).

The Coping Skills of Visualization and Positive Self-talk

Coping skills training has been shown to reduce LH deficits as well as immunize against the initial occurrence of LH. Meichenbaum (1977) was one of the first to design a systematic coping skills program, involving an education phase, a rehearsal phase, and an application phase. His initial theoretical and clinical work led to the empirical research of Altmaier and Happ (1985). Altmaier and Happ tested the effectiveness of coping skills on LH immunization by providing coping

skills training to 52 subjects and no training to the remaining 62 subjects. They found that subjects with the coping skills training were able to meet the performance criterion more often than the control.

Visualization training. Jacobson (1931) first supported the phenomenon of innervation in muscles that were related to movements being visualized. He subsequently proposed a theory involving increased physical performance as a result of visualization. In 1958, Eccles published support for the notion of a mental blueprint that is established as a result of the slight firing of neural pathways during imaginal rehearsal. Suinn (1980) published further support for the neural pathway or blueprint theory by demonstrating that the electrical activity of a skier's leg muscles during imagery exactly matched the terrain of the ski run. Visualization and other forms of imaginal rehearsal have received strong support in the performance enhancement literature (Corbin, 1972; Feltz & Landers,1983; Hall & Erffmeyer, 1983; Kendall, Hrycaiko, Martin & Kendall, 1990; Martens, 1982; Richardson, 1967a, 1967b; Ryan & Simons, 1981, 1983).

Martens (1982) summarized the important components to any sport-related visualization program:

1. teach what the skill is, why it is important and how to use it;
2. athletes should practice visualization from an internal perspective, as it would look out of their own eyes (Mahoney & Avener, 1977); and,
3. have athletes attempt to use all the senses and experience the emotions associated with the imagined skill.

Positive self-talk. One of the first uses of positive self-talk as a coping skill was in a clinical setting by Albert Ellis. According to Rational-Emotive Therapy (Ellis, 1979), illogical beliefs were proposed to be the primary cause of maladaptive behavior. By overtly rationalizing apparent problem situations, patients have been able to reduce destructive thought processes and resume productive lives. Similarly, behavior of children with learning disabilities has been altered by regulating overt self-verbalizations (Kendall, 1977; Meichenbaum, 1977).

In one of the few reliable sport-related self-talk research studies, Van Noord (1984) assessed the self-talk of 302 intermediate to world-class level tennis players. After establishing a valid and reliable instrument for measuring the self-talk of athletes, Van Noord demonstrated that effective players (those who had a rating of 4 or 5 on a 5-point Likert scale measuring steadiness, consistency and reliability) emitted more words of encouragement, praise, and on-task expressions than the ineffective players (those who had a rating of 1 or 2 on the 5-point Likert scale). Ineffective players were more self-critical, had lower self-efficacy and emitted more off-task phrases. Lastly, Van Noord noted that the self-talk component that most greatly differentiated the effective players from the ineffective players was not the amount of positive self-talk but rather the amount of negative self-talk. Regardless of how much positive self-talk an athlete used, if that athlete also used a high amount of self-defeating self-statements, he or she was most likely an ineffective player. This relationship has been shown to be a correlational one and not causal.

Attribution Retraining

Similar to positive self-talk training is a cognitive restructuring intervention technique most researchers of LH alleviation use called attribution retraining. Attribution retraining involves teaching the subjects to identify and modify irrational and maladaptive self-statements which tend to produce high stress reactions because they generate unrealistic and unachievable expectations. Overwhelming support exists for the use of adaptive attributions to increased persistence and self-efficacy. Dweck (1975) published attribution retraining research that emphasized using the internal attribution of lack of effort. She demonstrated that teaching students to attribute their failure outcome to lack of effort enabled that group to persist longer than a success only group that was not taught to attribute failure to lack of effort.

Fowler and Peterson (1981) also used attribution retraining in their work with children. Children who were taught to attribute failure to controllable factors like lack of effort demonstrated significantly more reading persistence than those who were not taught to use controllable attributions. Fowler and Peterson concluded by saying that because reading persistence also increased significantly in the presence of multiple failures without attribution retraining, multiple failures may be just as important a factor as attribution retraining in increasing post failure persistence. Relative to this point about the importance of failure to increasing persistence, Dweck (1986) said:

> The motivational research is clear in indicating that continued success on personally easy tasks (or even on difficult tasks within a performance framework) is ineffective in producing stable confidence, challenge seeking, and persistence. Indeed, such procedures have sometimes been found to backfire by producing lower confidence in ability. Rather, the procedures that bring about more adaptive motivational patterns are the ones that incorporate challenge, and even failure, within a learning-oriented context and that explicitly address underlying motivational mediators (p. 1046).

Regarding effort attributions then, Dweck and others agree that teaching children to attribute their failures to effort or strategy and not ability has and will continue to produce long-lasting changes in persistence in the face of failure that will be generalizable across tasks.

Klein et al. (1976) approached attribution retraining differently than Dweck and her colleagues by using the external attribution of high task difficulty instead of effort to explain failure. They found that depressed subjects in a clinical setting showed marked improvement by simply being taught to attribute a failure experience to an external cause that was out of their control. Since this early research, many others have shown support for the positive effects of using high task difficulty to explain failure (Alloy et al., 1984; Miller & Norman, 1979, 1981; Seligman, 1990).

Conclusions

The purpose of this literature review was to describe what LH deficits are, how LH deficits are formed, with which population groups research has been conducted, and what techniques have been used in attempt to reduce LH deficits. Past research has shown that emotional, motivational, cognitive and self-esteem

deficits arise from an improper goal orientation, maladaptive self-talk and attributions, and low efficacy expectations. However, research also supports methods for reducing and even immunizing subjects from LH deficits.

Recommendations for LH Deficit Reduction

Abramson et al. (1978) published recommendations for reducing LH deficits based on research to date. Their recommendations were so comprehensive that they are still being used today, with very little modification. In summary, those recommendations are as follows:

1. Change unrealistic attributions for failure to ones that are external, unstable and situation specific, and change unrealistic attributions for success to ones that are internal, stable and global (Abramson et al., 1978);
2. Make highly preferred outcomes less preferred by reducing the aversiveness of highly aversive outcomes (Beck, 1976; Ellis, 1962);
3. Change the expectation from uncontrollability to controllability by teaching adaptive coping skills, giving immediate feedback when subjects demonstrate control of outcome (Burgess, 1968), changing attributions for failure from inadequate ability to inadequate effort (Dweck, 1975), and to use imaginal rehearsal of successful response-outcome sequences; and,
4. Control negative and exaggerated self-talk by learning to monitor what is being said overtly and covertly and reducing the catastrophizing.

Based on these recommendations for LH deficit reduction as well as the results of research since 1978, a systematic tennis-specific program of goal orientation training, visualization training, positive self-talk and attribution retraining has been developed to enhance self-efficacy, increase the use of adaptive attributions and ideally reduce LH. In short, the program is designed to improve instrumental performance by establishing a contingency between effort and outcome.

CHAPTER 3

METHODOLOGY AND PROCEDURE

The overall purpose of this research was to test a temporal model of LH alleviation with young athletes. It was also hypothesized that by implementing a psychological skills training program, an athlete's self-efficacy, adaptive attributions and persistence at a task will be increased. To test these hypotheses, the learned helplessness of adolescent tennis players was assessed through a persistence test and a series of paper and pencil questionnaires.

Pilot Study

Twelve athletes from tennis clinics unrelated to the ones designated for the full data collection procedure were asked to take part in a pilot study. This pilot was used to assess the protocols required for obtaining approvals from the camp director and parents, educating coaches, utilizing the data collection instruments, implementing the 4 week intervention and control programs, and debriefing the athletes after the completion of the pilot. As a result of this pilot study, procedures for contacting camp directors and parents were streamlined, questionnaires were evaluated and the intervention program protocol was practiced. All athletes in the control group of the pilot study were debriefed, taught the psychological skills that the intervention group learned and given a logbook to enable continued practice of the PST program.

Subjects and Design

Description of Sample

Forty tennis players (20 males and 20 females) were selected from a tennis camp in the midwestern United States. The subjects were categorized as having a ranking in their age group (n=5) or no ranking (n =35). The age range of these athletes was 11 to 17 (M=14.2, SD=1.99). The frequencies by age were as follows: 11(n=5),12(n=4), 13(n=6), 14(n=7), 15(n=6), 16(n=5), and 17(n=7). Equal numbers of males and females and ranked and unranked subjects in the study were randomly assigned to either a control group or a psychological skills intervention group. Other demographic information includes race (95% Caucasian), divorced or separated parents (7.5%), athletes who live with both parents (90%), number of siblings (none: 20%; one: 27.5%; two: 35%; three or more: 17.5%), age started tennis (under 8 yrs old: 30%; 8-10 yrs old: 30%; 11-13 yrs old: 30%; over 13 yrs old: 5%; not sure: 5%), subjective skill rating (very low: 17.5%; low: 30%; average: 35%; high: 7.5%; very high: 10%), and tennis ranking (any state ranking; 12.5%; no ranking: 87.5%). All athletes were regular participants in the tennis camp, practicing at least 3 days a week. These athletes were assessed by the camp coordinators to ensure that none had any debilitating health problems.

Sample Acquisition

Because of the limited resources of this field-based intervention, the subjects were not randomly chosen from the entire population of adolescent tennis players in the United States. Twelve camp directors were contacted by telephone and

letter and the camp that best met the restrictions of the study was used to acquire the sample. These restrictions existed at most camps or were ones to which participants could easily adhere. All participating athletes met the following requirements: (a) athletes participated at the facility at least an average of 2 hr per week; (b) all coaches participated in 3 hr of educational meetings before the start of the study; (c) athletes attended a half hour meeting before on-court training started each day; (d) the camp had no PST program in use and did not employ a sport psychologist; and, (e) the first week, the third week and the fifth week of the research involved testing all athletes in the study.

Research Design

Each subject was randomly assigned to a treatment or control group, given the treatment, and then assessed again after 2 weeks and 4 weeks. The basic design of the experiment was a 2 X 2 (Treatment by Phase) repeated measures multivariate analysis of variance (MANOVA) with self-efficacy, attributions and change scores for LHA and LHB being the dependent variables. Change scores were calculated by subtracting the pretest scores from the midtest and posttest scores. Path analysis was also utilized to test the fit of the proposed causal model of LH.

Measures

To gather demographic information, a background questionnaire was given to each participant (see Appendix A for copies of all data collection instruments). Questions pertained to age, sex, race, past tennis experience, family status (divorce, siblings), perceived athletic ability, perceived importance of tennis

success, interest in learning new skills to enhance performance, knowledge of attribution retraining and LH and sources of pressure to compete.

To measure the three dependent variables, four separate instruments were used. First, to measure tennis-serve efficacy expectations, a tennis-serve specific measure was developed based on the work of Bandura (1977). The questionnaire consisted of 10 items which involved self-ratings of how confident players thought they were about serving and hitting a target in the service box 1 time in 10 tries to 10 times in 10 tries. The ratings were made on a scale from 0 (very low confidence) to 10 (very high confidence). Self-efficacy strength was calculated by adding up all the rating values and dividing by the number of levels rated 1 or above. Scores for strength could range from 0 to 10. This technique of measuring self-efficacy was found to be reliable when adapted for specific sports (Feltz et al., 1979; Hogan & Santomier, 1984). Furthermore, validity for this technique was demonstrated by McAuley (1985) through path analytic techniques which showed that subjects' self-efficacy cognitions were significant predictors of their performance.

To measure the attributions of athletes, another paper and pencil instrument was employed. Peterson, Semmel, von Baeyer, Abramson, Metalsky and Seligman (1982) produced the Attributional Style Questionnaire (ASQ), initially designed to measure the causal attributions of depressives for the good and bad events in their lives. This questionnaire consists of 48 multiple choice questions producing an overall attributional style score as well as a rating on internality, stability and globality for positive and negative events. Depending on whether the response to the item was

adaptive or maladaptive, a 1 or -1 was assigned respectively. The overall score was used for all statistical tests. Scores could range from -24 to +24. Internal reliability, using Cronbach's (1951) coefficient alpha, were reported as .75 and .72 for the composite attributional style scale for good and bad events, respectively. Extensive testing by Peterson and Seligman (1984) has demonstrated adequate validity of the ASQ and the Children's Attributional Style Questionnaire (CASQ - Seligman, Peterson, Kaslow, Tanenbaum, Alloy & Abramson, 1984). The CASQ was used in the current research.

To measure LH, two tests were used: one to assess persistence in the face of failure (Tennis Serve Persistence - TSP), and the other to assess maladaptive achievement patterns associated with LH, the Maladaptive Achievement Pattern Questionnaire (MAPQ). The TSP was designed specifically for the current research to be a very difficult but realistic test of one's ability to hit a hard, accurate first serve. Three pylons were placed 3 ft apart and 3 ft inside the 'deuce side' service box. Subjects were told that this test assessed first serve ability and hence the goal was to knock over three pylons consecutively. After listening to the test protocol (Appendix B), each athlete was allowed to attempt to meet the criterion for as long as he or she wished. Each athlete obtained a persistence score based on the amount of time that he or she persisted in the task. Number of trials was not used as a measure of persistence because some subjects served very quickly while others took their time and were careful about the accuracy of each serve. Pilot test questioning generally indicated that those who served quickly had a lower belief in their serving ability

and hence wanted to increase their luck and the chances of knocking over a cone by serving a greater number of balls. Using time as a measure of persistence alleviated the potentially confounding nature of the fast server by preventing people who attributed their serving performance to luck to also appear to be persistent because of the high number of trials they took.

The second measure of LH used was the MAPQ developed by Prapavessis and Carron (1988) to "...assess the degree to which subjects possessed maladaptive perceptions of a cognitive, motivational and emotional nature concerning their failure experiences" (p. 194). The questionnaire consisted of 14 Likert style questions, with the scale ranging from 7 (maladaptive) to 1 (adaptive). The scale was reversed for scoring so that a total of questions 1 to 3 and 5 to 13 would produce a maladaptive achievement pattern score that would enable a larger number to mean more adaptive functioning. Questions 4 and 14 were filler questions. Support for construct validity of the MAPQ was established by a t test that showed coaches' persistence ratings of the helpless group to be significantly lower than for the nonhelpless group, $t(45) = 2.51$, $p < .02$. Test-retest reliability was obtained as a result of the 3-phase design of the current research ($r = .62$, $p < .0001$). The questionnaire in Appendix A was named TMAPQ, for Tennis Maladpative Achievement Pattern Questionnaire, because of several minor changes made to make the questionnaire tennis specific. The changes made to the instrument to make it easier to use and more appropriate for the current sample were, (a) questions 2, 3, 5 and 7 were changed to a 7-point Likert scale from a 2-point scale; (b) minor rewording of questions, such as, "Do you feel good about your tennis

performance during matchplay?" which was changed to, "Rate how good you feel about your tennis match performances." The basic content of the questions remained unchanged. Possible scores could range from 12 to 84.

Treatment - Psychological Skills Training

The psychological skills intervention involved four 1/2 hr workshops, 8 hr of researcher-monitored on-court reinforcement, and the daily completion of a log book. The skills to be taught included (a) attribution/self-talk retraining, (b) visualization training, and (c) goal orientation training (Appendix C). On the first day, a short overview of the importance of PST was followed by goal orientation training and attribution/self-talk retraining. Details on what the skill is, why it is important and how it should be practiced were discussed for each skill. This information, along with daily monitoring charts was also included in each athlete's log book (Appendix C). The skills included in the intervention program were ones suggested by Abramson et al. (1978) as effective methods of reducing LH tendencies, as well as from suggestions made by Dweck (1979), Halliwell (1979) and Prapavessis and Carron (1988) regarding use of goal orientation training and coping skills.

The control group program included: (a) jump rope training, (b) strength training, and (c) proper stretching. See Appendix D for a description of each of these skills and a copy of the daily monitoring chart used. Both groups met with the researcher on the same weekends, but the days and times varied according to when their on-court drilling took place. Because the participants in the one group did not come in contact with participants in the other group, the problem of inter-athlete contamination did not

exist. Still, all participants were asked to refrain from discussing details of the experiment with anyone except parents.

Procedures

Initial Camp Contact

The director of the participating camp agreed in writing to the restrictions as stated earlier, informed the participating coaches of the 3 hr of educational meetings, and informed the athletes of the upcoming research. Two weeks before the study started, a packet was given to each athlete to be taken home to his/her parents. This packet informed the parents of the ensuing research, asked them to consent to their child's participation and asked them to choose a time most convenient for pretesting (see Appendix E). Testing and meeting dates were supplied at that time and detailed when the research was to start and end and what the parents and children were being asked to do.

A list of all participating coaches was obtained from the camp director and used to randomly place the coaches into one of the two training groups. A schedule was returned to the director with the times that the coaches should report to the educational meetings. After the facilities director accepted the research schedule, courts were reserved to enable tennis serve persistence testing to be scheduled.

Initial Coach Meetings

The researcher traveled to the site of the camp the week before testing and scheduled the 3 hr of coaching education seminars. The coaches were assessed with

regard to their knowledge of psychological skills by completing the Coaching PST questionnaire (see Appendix F).

The coaches were then introduced to the skills that they were to reinforce to the athletes in their group during the following weeks. The coaches were told that one of the objectives of the study was to test the effectiveness of several training programs and that they have been randomly selected to work with the athletes in one group only during the next 4 weeks. They were then informed that both groups were the same with respect to ability, age and sex.

All coaches were asked not to inquire (or respond to inquiries from athletes) regarding the content of the training programs being taught in the other group, so as not to jeopardize the experiment. Because many of the skills taught by the researcher were new to the athletes and were difficult at first to grasp, the reinforcing role of the coaches was strongly emphasized. The coaches were asked to remember what the skills of the week were and then to reinforce their proper use during the on-court practice, when applicable. Because some skills required at-home practice, coaches were asked to remind the athletes to do the practice.

After the first week, the coaches took a more active role in their particular program, and the specifics were detailed to them during the seminars and again after the first week. In short, the coaches were asked to take an active role in ensuring that the daily worksheets were being completed, and that the athletes remembered to practice the skills on and off the court. Ways in which the coaches motivated the athletes to complete the 4 week individualized program involved rewards for being the

most committed to the research program (free indoor court time and reduced cost lessons) as well as small daily prizes for the best on-court effort at practicing the research related skills (wrist bands, hats, T-shirts and Powerbars).

Initial Meetings With Athletes

Four weeks before the experiment began, the researcher met with all the athletes. A basic explanation of the research occurred at that time. Athletes were asked to participate voluntarily in research designed to help their tennis performance while providing valuable information about several training methods. Two weeks later they were given an information sheet, consent form and pretest sign-up sheet to take home to their parents. The consent and sign-up sheets were collected the following week. See Appendix G for a chart that details the experiment and its preparation.

Pretesting of Athletes

Athletes were assessed during the first week at a time mutually convenient for them and the researcher. Assessments took approximately 1 hr per subject and were staggered 15 min apart to ensure that there were not too many athletes present at the same time. On a court difficult for others to accurately assess the subject's performance, the investigator individually assessed each athlete's persistence in serving. At no time during the research was there any prolonged observation and/or support, verbal or otherwise from people at the facility that might have increased or decreased performance or persistence.

After the serving persistence test, the athlete completed the rest of the questionnaires in the following order: (a) background questionnaire; (b) CASQ, (Seligman et al., 1984), (c) self-efficacy questionnaire for serving accuracy; and (d) the modified MAPQ (Prapavessis & Carron, 1988).

Once all pretest data were collected and an LH score obtained, the athletes were randomly placed into one of the two training groups. At this time, the researcher checked to make sure each group had the same number of overall subjects, the same number of males and females, as well as LH means that were not significantly different. Based on the results of the pretest instruments, individualized PST programs were developed for each subject in the treatment group. For example, subjects with low self-efficacy focused on goal orientation and visualization training, whereas subjects with maladaptive attributions or achievement patterns concentrated on attribution and self-talk retraining. While all subjects eventually learned all the skills, certain ones deemed most immediately influential were emphasized earlier than others with the hope that the chances for change after 4 weeks would be increased. Each athlete received an information book describing what each skill was and how to practice it, and a log book where daily records were kept regarding skill practice. The athletes in the control group received a program consisting of skills that were unrelated to LH alleviation but that were a realistic aid to the physiological aspects of competitive tennis.

The intervention and control groups participated in a 1/2 hr workshop prior to each practice. Both groups were required to arrive half an hour prior to the normal

starting time. Those who were absent from any meeting attended a make-up session on the following day. After meeting with the researcher, the athletes followed their usual on-court practice routine. The only exception was that reinforcers and directives were given to enhance the use of the particular skills learned off-court.

After 2 weeks, appointments were scheduled for the following week, when all athletes were given a mid-test in the same manner as the pretest. After 4 weeks, appointments were again made for the following week, when all athletes were tested for a third and final time, in the same manner as the pre- and mid-tests. All subjects were then debriefed regarding the main focus of the research. At that time, the control group met with the researcher and the intervention skills were taught. Specific programs were then designed for those who were interested in continued practice of the skills. Because all the subjects specifically asked for their results compared to group means, a summary detailing this information was sent to each participant. Subjects received detailed information regarding only their own performance and were not told who else participated or the scores of others. Additional logbook copies were sent to those who requested them.

CHAPTER 4

RESULTS AND DISCUSSION

While a great deal of literature exists to direct practitioners toward methods of reducing LH deficits, no causal model has been tested to demonstrate the interrelationships that have been independently hypothesized between influential variables. Such a model would serve to guide the efforts of theoretical research with the goal being more detailed and reliable LH deficit reduction techniques for practitioners. The initial steps to testing such a model were taken in the current research.

Also, in light of the increasing attrition problem among youth sport participants, an attempt to reduce LH, one of the potential causes of attrition, was undertaken in the current research. The development of a program to teach youth sport participants the importance of persistence in the face of failure, as well as how to use adaptive attributions (optimism), was developed and tested. This program was based on the proposed causal model of LH.

Results

Causal Model of Learned Helplessness

The first eight hypotheses dealt with the relationships between LH, self-efficacy and attributional style. Hypothesis 1, which stated that the higher an athlete scores on LHA (serve persistence), the higher will be the athlete's self-efficacy beliefs for the tennis serve, was tested by correlating the

self-efficacy and persistence scores of each athlete. Results indicated a significant, but moderate relationship between self-efficacy and serve persistence, for the first and third phases respectively (r = .39, p < .05; r = .36, p < .05). There was no significant relationship between persistence and self-efficacy beliefs in the second phase (r = .26, p > .05).

The positive relationship between serve persistence and self-efficacy at pretest may have been due to the subjects' surprise at the difficulty of the task and their subsequent poor performance. Self-efficacy may have been temporarily reduced as a result of the self-doubt the subjects were feeling. After 2 weeks in their respective programs, many reported feeling eager to try the serving task again. However, their persistence was again low at the midtest. At that point, subjects may have already labeled the task too difficult, thus maintaining their efficacy expectations and preventing any relationship between persistence and self-efficacy. Two weeks appears to be too short a time period for the intervention group skills to have an effect on self-efficacy. However, on the third test (4 weeks after the pretest), the intervention group showed much more serve persistence. They may have developed their intervention skills enough to increase persistence time while maintaining efficacy expectations because the significant relationship emerged again between the two variables. Since the control group was not taught persistence or self-efficacy enhancing skills, both their persistence and self-efficacy remained low. The means and standard deviations for self-efficacy and persistence measures are contained in Tables 1 and 2.

Table 1: Means and Standard Deviations for Self-Efficacy

	Intervention			Control		
	M	SD	Range	M	SD	Range
Phase 1	4.72	1.66	2.00-8.10	4.16	1.74	1.50-7.29
Phase 2	5.12	0.99	3.30-6.50	4.18	1.85	0.00-7.10
Phase 3	5.22	1.14	2.29-7.00	4.37	1.84	1.75-7.14

Note: Larger mean values represent higher self-efficacy

Table 2: Means and Standard Deviations for Time Persisted in Minutes (LHA)

	Intervention			Control		
	M	SD	Range	M	SD	Range
Phase 1	16.10	12.07	1-40	13.60	9.53	2-35
Phase 2	18.00	11.04	1-40	13.80	10.35	1-40
Phase 3	22.95	10.25	6-38	8.70	6.11	1-27

Note: Larger mean values represent more adaptive functioning

Hypothesis 2, which stated that the higher an athlete scores on LHA, the more the athlete will utilize adaptive attributions, was tested by correlating persistence and attribution scores for each athlete. There was no significant relationship between athletes who scored high in serve persistence and adaptive attributions for any of the phases (Phase 1: $r = .07$, $p > .05$; Phase 2: $r = .10$, $p > .05$; Phase 3: $r = .26$, $p > .05$). Attribution scores ranged from -6 to 21 and TMAPQ scores ranged from 41 to 84 across the phases. See Table 3 for attributions and TMAPQ means and standard deviations.

Hypothesis 3 stated that there would be a positive correlation between adaptive perceptions of failure (LHB) and adaptive attributions. Results indicated a significant, but moderate relationship between the two variables for the second and third phases respectively ($r = .35$, $p < .05$; $r = .48$, $p < .05$). There was no significant relationship between LHB and adaptive attributions in the first phase ($r = .22$, $p > .05$).

Table 3: Means and Standard Deviations for Attributions and TMAPQ (LHB)

	Intervention				Control			
	Attribution		TMAPQ		Attribution		TMAPQ	
	M	SD	M	SD	M	SD	M	SD
Phase 1	5.85	4.37	62.60	7.50	5.90	4.86	62.80	10.12
Phase 2	7.10	4.59	63.35	7.81	6.65	4.56	63.80	9.43
Phase 3	7.95	6.86	64.25	9.89	5.15	4.66	64.00	11.76

Note: Larger mean values represent more adaptive functioning

There are several possible explanations for the lack of a significant relationship between persistence and attributions. Four weeks of practice attributing failure situations adaptively, and then only using this new skill during on-court practice, most likely did not provide sufficient exposure and familiarity with the concepts such that they could be used during times of stress and failure to improve persistence. Subjects may have been attributing adaptively, but the connection between thought and behavior had not yet been established. In other words, subjects may have been reciting the proper attributions, but the words did not mean enough to them to change feelings and hence behavior. Furthermore, most reported never experiencing a situation with as much failure as the serve test had, and many even had difficulty remembering any failure situation they experienced during the

previous week. Because most of the subjects were not playing in tournaments or engaging in stressful competition, there may have been too few task-similar situations in which to practice adaptive attributions in the face of failure. Last, given the group nature of the intervention, which cannot supply as much one-on-one attention as private meetings, more time may be required to reinforce the new cognitive skills.

Hypotheses 4 through 7 were tested using path analysis on the model hypothesized in Chapter 1. The path coefficients for the hypothesized model are contained in Figure 3. The fourth hypothesis stated that LHA and LHB would predict self-efficacy in each phase. However, results only partially supported this hypothesis. LHB (as measured by TMAPQ) did not have any significant paths leading to self-efficacy. LHA was a significant predictor of self-efficacy in Phase 1 (.326) and Phase 3 (.332). This finding parallels the result for the correlational analysis conducted for the first hypothesis.

The fifth hypothesis stated that the LH measures and self-efficacy together would predict attributional style. As can be seen from Figure 3, only LHB predicted attributional style in the second and third phases. These results also paralleled the correlational findings for the second and third hypotheses.

Hypothesis 6a and b, which stated that attributional style would predict LHA and LHB respectively, was not supported for either. Hypothesis 7 was also not supported. Attributional style was also not a predictor of self-efficacy.

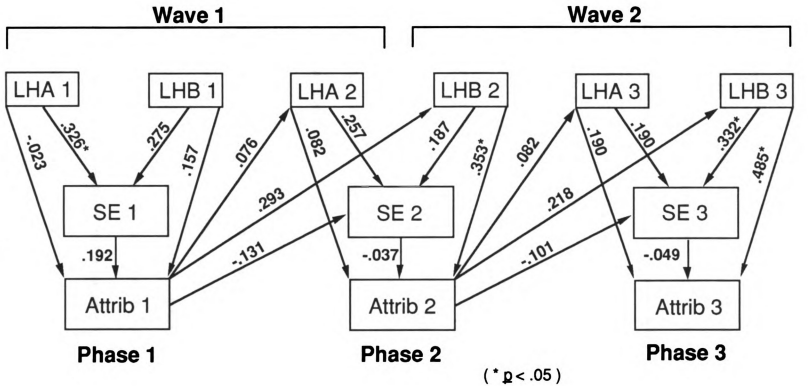

Figure 3: The Proposed Model of LH with Coefficients

Hypothesis 8 was concerned about how well the hypothesized model, as a whole, fit the observed data. In comparing the hypothesized and full models, the hypothesized model did fit the data as well as the full model containing all logical recursive pathways but neither model provided a very good fit of the data. Comparisons are contained in Table 4. The path coefficients for the full model are presented in Figure 4 (see Appendix I for the variance-covariance matrix used).

Reasons for a lack of good fit may include unreliable measures, omission of other causal variables, relationships among the variables that are curvillinear or multiplicative, or a small sample size. While the instruments were all found to be reliable measures of their respective variables, using instruments that were all tennis specific would have most likely reduced the measurement error. Regarding variable omission, the literature does not currently support more prominent causal variables of LH than the ones currently used, however, others may certainly exist. As far as an appropriate sample size, Joreskog and Sorbom (1989) suggest anything from 25 to 2500, so it is difficult to know whether a larger sample size would have improved the fit. Last, scatterplots of variables used in the models did not appear curvilinear, but with a greater sample size and thus more points graphed, curvilinearity may become apparent. One way the data may have fit the model better is if the proposed pathways had been carried out over four waves instead of two, and the measures were taken at a time closer to subsequent LH.

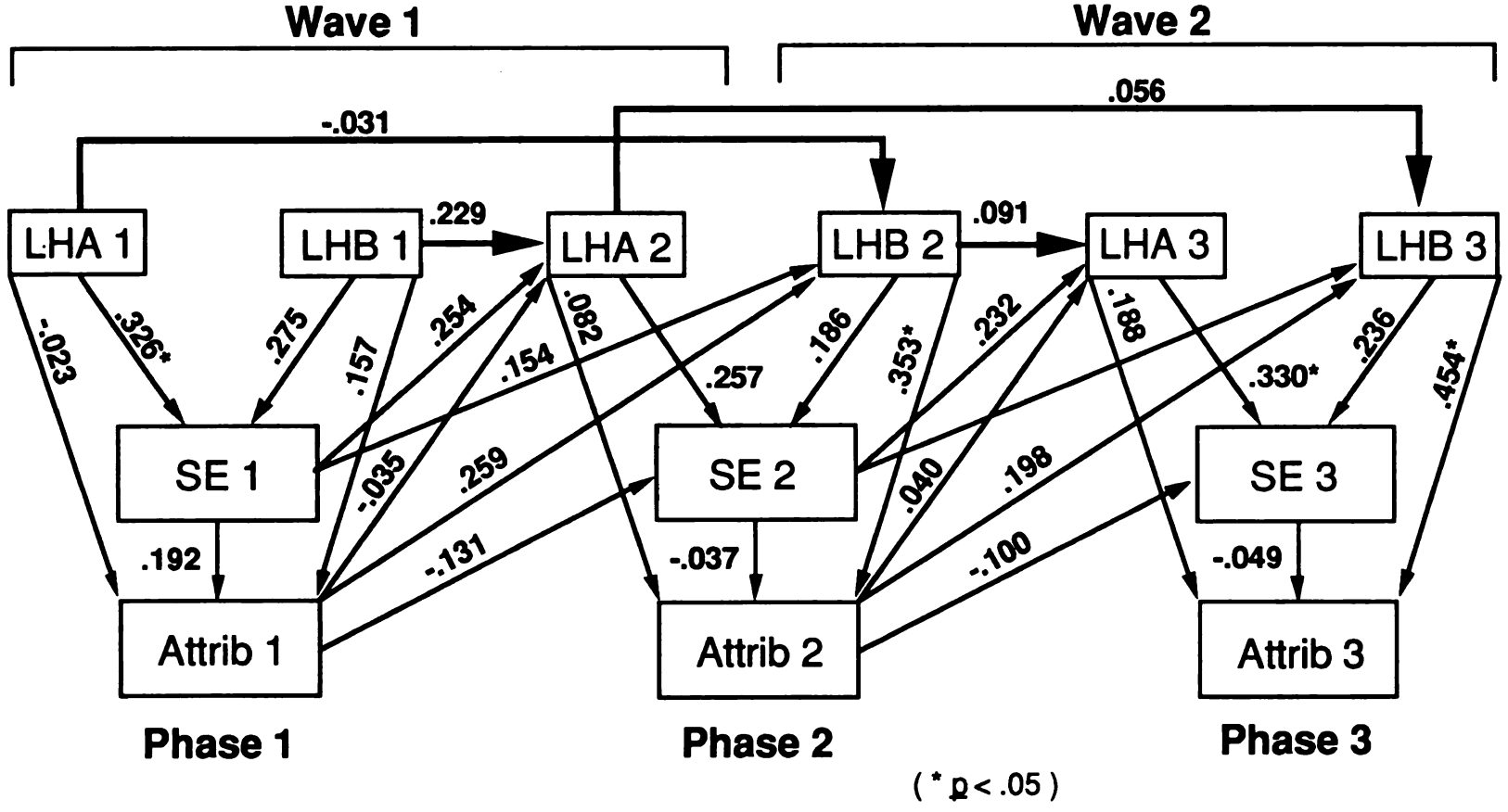

Figure 4: The Full Model of LH with Coefficients

Table 4

Comparison of Goodness of Fit Indices for Hypothesized and Full Models

Model	df	X^2	GF1	AGFI	RMSR
Hypothesized	44	226.41*	.556	.212	20.02
Full	36	210.77*	.560	.046	17.46

*$p < .001$

Note: GFI = Goodness of Fit Index; AGFI = Adjusted Goodness of Fit Index; RMSR = Root Mean Square Residual

Effects of Psychological Skills Training

Prior to testing the intervention hypotheses (9 through 11) a manipulation check was utilized to ensure that the subjects in the intervention group were, indeed, learning the coping and attribution retraining skills. To do this, an analysis of variance was used on manipulation test (Appendix H) scores. The results showed that the groups did differ [$F(1,38) = 9.45$, $p < .01$], with the intervention group ($M = 60.63$) scoring higher than the control group ($M = 41.25$). The answers were not given to the control group so this manipulation check test would not be a source of contamination.

Hypotheses 9a and b stated that the level of LHA and LHB of athletes will be lower (i.e., persistence and adaptive perceptions will be higher) after 4 weeks of PST intervention, when compared to the control group. These hypotheses were tested using a 2 X 2 (Group X Phase) repeated measures multivariate analysis of variance (MANOVA) on the LH change scores from pretest. Results indicated a main effect for intervention group, $F(2,37) = 4.48$, $p = .018$, and an interaction, $F(2,37) = 8.81$, $p = .001$. Standardized discriminant function coefficients indicated that LHA (SDFC = 1.00) contributed more than LHB (SDFC = .12) to the overall multivariate effect. As can be seen in Figure 5, the control group decreased their persistence from Phase 2 to Phase 3. This result supports the main hypothesis of the current research, that learned helpless behaviors can be reduced through the implementation of an individually designed psychological skills training program from within a group setting. These findings support previous literature espousing the importance of attribution retraining and goal orientation, visualization and self-talk training in the reduction of LH tendencies (Altmaier & Happ, 1985; Ames, 1984; Bandura & Schunk, 1981; Elliot & Dweck, 1985; Fowler & Peterson, 1981; Dweck, 1975; Meichenbaum, 1977; Miller & Norman, 1981; Prapavessis & Carron, 1988).

Hypothesis 10, which stated that serving self-efficacy will be higher after 4 weeks of PST intervention, was tested using a 2 X 2 (Group X Phase) repeated measures MANOVA on self-efficacy change scores. Results indicated no significant main effects or interaction. Serving self-efficacy was not significantly higher after 4 weeks of PST intervention compared to controls [$F(1,38) = .54$, $p > .10$]. Several explanations

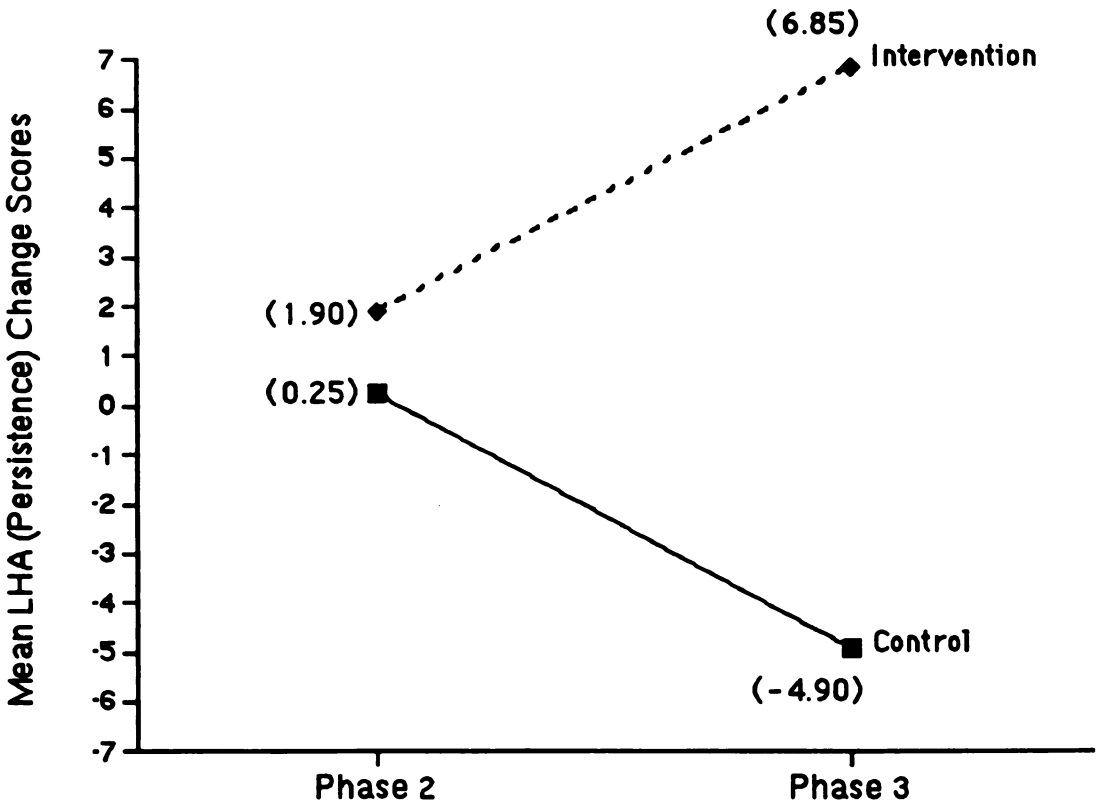

Figure 5: Mean Persistence Change Scores by Group and Time

for the lack of support for Hypothesis 10 are that either the task was so difficultthat nothing could improve efficacy expectations, or more likely, visualization and goal orientation training are ineffective in the improvement of self-efficacy in only 4 weeks. In examining the pattern of the significant means in Table 1 and the fact that the effect size between intervention and control was 0.46 at Phase 3, the second explanation is more likely.

Hypothesis 11, which stated that the attributional style of athletes will be more adaptive after 4 weeks of PST intervention, was tested by using a 2 X 2 (Group X Phase) repeated measures MANOVA on attributional change scores. Again, no main effects or interaction were found. The attributional style of athletes was not significantly more adaptive than the control group after 4 weeks of PST intervention [$F(1,38) = 3.01$, $p > .09$]. However, Figure 6 illustrates a trend in the predicted direction. The effect size between intervention and control was .60 at Phase 3. Based on previous research, there should have been a positive effect of the PST program on attributional style. One explanation for the nonsignificant finding was that the program may not have involved enough contact time with the subjects to make significant changes. Again, it is worth noting that there was a trend in the predicted direction (Figure 6) that may be statistically significant when the methodological issues of not enough phases, too little time between phases, and too few task-similar situations in which to practice, which were noted earlier, are rectified.

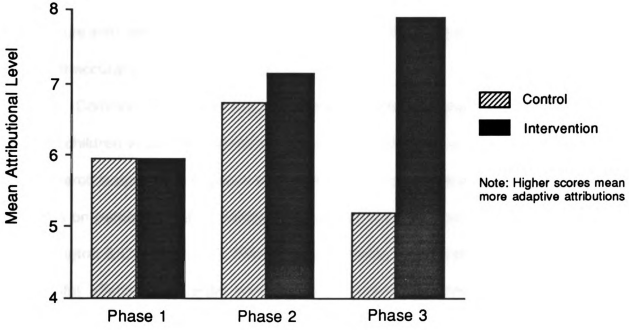

Figure 6: Adaptive Attributions by Group Across Phases

Exploratory Questions

There were several relationships tested in the current research study for which hypotheses were not formally made either because of the abundance of literature already supporting the predicted result or because the question was exploratory. The two exploratory questions pertained to the relationship between parental pressure and LHA and LHB and the relationship between target accuracy and a psychological skills training program (PST). There was no significant correlation between parental pressure and LHA = .09 or LHB =.12, nor was there any apparent effect of PST on serving target accuracy [$F(1,38) = .001, p>.10$].

Common sense would suggest that parents who put a great deal of pressure on their children to success would be stripping their children of intrinsic motivation. Research supports the negative effects of external motivators and outcome-related goals on persistence and maladaptive achievement patterns (Ames et al., 1977; Covington & Omelich, 1979; Elliot & Dweck, 1988). In light of this support for the harmful effects of parental pressure, the current research did not confirm a relationship with LH. This may be due to the moderate to low average parental pressure reported by the subjects ($M = 1.68$, $SD = .76$ on a scale of 1, very low, to 4, very high pressure). Some subjects may define 'pressure' differently than others. If pressure somehow represents how much their parents care, help and support them, such as parents often giving reminders to practice hard, a significant relationship between pressure and LH would not be found. Also, because only a few of these subjects had aspirations to play tournament tennis, their parents may not be pressuring them or are pressuring

them in a different activity. A sample with more 'serious' tennis players may provide very different results. However, there was a negative correlation between the amount of parental pressure and how important it was for the subject to succeed at tennis, supporting a relationship between parental pressure and decreased intrinsic motivation ($r = .33$, $p < .05$).

With the abundance of research supporting the positive relationship between visualization and performance (for a summary see Feltz & Landers, 1983), one would predict serve accuracy to improve with the implementation of a 4 week visualization program. However, there was no difference between treatment and control groups in the distance the ball landed from the target (estimated after each trial for every subject). The means for the control and intervention groups respectively were 2.06 ft ($SD = .222$) and 1.96 feed ($SD = .185$) from the target [$F(1,38) = .001, p > .10$].

The main reason why there was no significant improvement obtained by the group undergoing visualization training is the complexity involved with the movement and the relatively low ability level of the subjects. The tennis serve is a very unnatural sequence of complex movements requiring a combination of fine and gross motor skills. Without technical help to reduce the abundance of inefficiencies observed in most of the subjects' serves, visualization could not be effective. Even if the subjects were clearly and vividly visualizing their serve hitting the target, their bodies would not be able to duplicate the mental rehearsal with any accuracy because of the lack of a well established neural pathway.

Another relationship with an abundance of supporting literature that was not reinforced by the current research study pertained to the effect of divorce on LH. For certain ages and circumstances, divorce has been shown to be a significant predictor of deficits related to LH (Emery, 1982; Guidubaldi, Perry & Nastasi, 1987; Wallerstein & Kelly, 1980), but was not found in the current research study (LHA:r = .02, LHB:r = .01). However, with only 5% of the subjects having divorced parents, the primary reason for the failure to support previous literature is that the sample size was too small.

Discussion

Primarily because LH has been shown to lead to depression (Seligman, 1990), much research has focused on finding effective methods of reducing the deficits associated with LH. That research has clearly demonstrated that LH deficits can be reduced and even prevented in academic and laboratory settings. While the current field research did not support the proposed theoretical model of LH, the intervention was able to reduce levels (i.e., improve persistence) by focusing on the same variables that are in the model.

While the proposed causal and full model of LH did not fit the data very well, there is important information to be gained from the models. First, it is apparent that LH (in the form of lack of persistence) is a moderately strong predictor of self-efficacy. Second, LH (in the form of maladaptive achievement patterns) becomes a stronger predictor of attributional style as time progresses. Within the last two phases, the higher the maladaptive perceptions, the lower the likelihood of an

adaptive attributional style. It appears that the behavioral and cognitive components of LH predict different cognitive processes. Persistence is more predictive of self-efficacy beliefs and maladaptive perceptions of failure are more predictive of attributional style.

In terms of a reciprocal relationship with LH, self-efficacy and attributional style were not consistent predictors of LH. A primary reason for the absence of attributions being a consistent predictor of LH was that subjects who did not have an attributional style, and hence did not consistently use the same types of attributions after performance, confounded the current investigation which as trying to determine if stable relationships existed. Even though subjects demonstrated that they understood what adaptive attributions were by responding consistently on the attributional style questionnaire, when their attribution to the question, "Why were you not able to knock over three targets in a row?" was classified as either adaptive or maladaptive, there was no significant correlation between the first and second phase attributions, the second and the third phase attributions, or the first and the third phase attributions respectively.

A possible explanation for the lack of significant paths from self-efficacy to LH is the distance between when self-efficacy was measured and wehn subsequent LH scores were contructed. Bandura (1986) indicates that temporal disparities between self-efficacy judgments and subsequent behavior or performance can affect the strength of their relationship. "The relationship between self-referent thought and action is most accurately revealed when they are measured in close temporal proximity"

(p. 396). In the full model, the self-efficacy assessments in the SE1 to LH2 and SE2 to LH3 paths were taken 2 weeks prior to the LH measure. The intervening experiences during these periods were probably more potent influences on LH than were earlier self-percepts of efficacy.

Lastly, in terms of the model, the two components of LH-persistence and perceptions of failure-appear unrelated and unpredictive of each other over time. Perhaps the TMAPQ was not as valid a measure of LH as other measures. If LH is characterized by the perception that one has no control over the occurrence of a negative outcomes as Maier et al. (1969) suggest, the TMAPQ may not be a strong enough measure of that concept. The TMAPQ also assesses other perceptions that may offset one's ratings regarding control. For instance perceptions regarding dedication, enjoyment, and motivation are assessed. Future reearch should carefully assess the psychometric properties of the TMAPQ and its tennis-oriented equivalent.

The intervention program was considered successful in that the level of LH (persistence) of athletes was significantly lower after 4 weeks of PST compared to the control group. In addition, there was a trend toward making more adaptive attributions after PST compared to the control group. Because the PST program involved a number of skills, it is difficult to determine if any one skill was more important than another in lowering LH. While attributional style was not shown to be causally related tosubsequent LH, subjects appeared to be utilizing information taught in the attribution retraining sessions more so than any other skill when responding to the failure situation.

Given the current support for the use of a psychological skills training program in reducing LH, consultants and coaches should continue to apply and assess the effectiveness of such skills with their adolescent athletes. It is important to remember that first, these are skills that must be learned and practiced regularly, and second, a psychological skills training program like the one used in the current research can have beneficial results for both LH and mastery oriented athletes because the coping and cognitive restructuring skills apply to physical activity as well as life in general.

Chapter 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The current research tested a causal model of LH, involving the relationships among self-efficacy, attributions and LH. Also, a program of skills designed for youth sport participants to reduce the deficits associated with LH was developed and assessed.

Forty adolescent tennis players of varying ability levels were randomly divided into two equal groups. One group was given an intervention program designed to reduce LH tendencies and the other was given a physical training program designed to have strength and endurance value only. Subjects were pretested and then tested twice more at 2 week intervals.

The first test required subjects to try to knock over three orange pylons consecutively with their serve. Because there was no time limit and the subjects could stop whenever they desired, a persistence in the face of failure score was obtained. The other tests were in paper and pencil format and assessed serving self-efficacy, use of adaptive attributions and presence of a maladaptive achievement pattern. LH was represented by the serve persistence (LHA) and maladaptive achievement pattern scores (LHB).

Results from the path analysis indicated that, as a whole, neither the proposed nor the full model fit the data well. There is substantial theoretical support for the proposed model and certain relationships were indeed supported. LHA predicted

self-efficacy in the first and third pahses, and LHB predicted attributional style on the mid- and post-tests. However, support for the proposed and full models was not found.

Results of the 2 X 2 MANOVA showed that the task persistence of the intervention group were significantly improved compared to the control group as a result of the 4 week PST intervention program. This program consisted of attribution retraining along with a psychological skills training program composed of self-talk training, visualization training and goal orientation training. This adds support for the value of PST programs in the enhancement of athletic performance.

Conclusions

The following list represents the major conclusions from the current research:

1. The proposed causal model of LH received weak support because it did not fit the data well. LHA and LHB were shown to be a good predictor of subsequent self-efficacy and attributional style respectively, but attributional style did not predict LHA or LHB.
2. Subjects' self-efficacy regarding tennis serve accuracy was positively related to persistence during the first and third phases of the failure oriented tennis serve target task.
3. A 4 week PST intervention program of attribution retraining, goal orientation training and visualization training significantly reduced the level of LH in terms of persistence in the athletes.

Recommendations for Future Directions

While in the current research all the proposed relationships did not hold for the two wave causal model, the information gained will allow future modifications to be made. To improve on the current research study, future researchers might consider the following points: (a) lengthening the intervention program to 6 or 8 weeks which would allow the subjects more time to practice the coping skills and other information taught, (b) including more waves in the path model to enable consistency measurements of relationships within waves, (c) using more elite subjects who have the requisite skill and motivational levels to justify the testing of self-efficacy as a predictor of behavior, (d) designing longer time periods in between assessments, perhaps 3 or 4 weeks, to enable subjects to learn the new skills being taught, (e) providing more individual attention to make sure the subjects not only know what the skill is but how to use it after failure situations, and (f) measuring self-efficacy just prior to the persistence test instead of after which would allow self-efficacy to be tested as a predictor of persistence and LH within each phase.

The current research study attempted to identify the behavioral component of the LH variable before assessing the cognitive variables that were proposed to affect future persistence behavior. This was done primarily to avoid the problem of assessing cognitions about a behavior that the subjects do not fully understand. In doing so, the temporal path within Wave 1 was required to run from the LH variable to self-efficacy to attributional style to subsequent LH. Future research should attempt to familiarize subjects with the task and then, within each wave, assess self-efficacy and attributional style prior to assessing the persistence component of

LH. In this way, it is possible that paths from these cognitions to LH could be supported, and hence shed light on what predicts LH instead of what LH predicts.

A large body of support exists for self-efficacy as a behavioral mediator (Bandura, 1986). While it appears that self-efficacy is not supported as a mediator of LH in tennis serving in the proposed model, when self-efficacy was regressed on tennis serve persistence, a relationship was found on the first and third phases. It is important to remember that self-efficacy is a major determinant of behavior only when proper incentives and necessary skills are present. The current sample had only moderate skills but recorded above average desire to perform well. It is necessary for future research assessing LH - self-efficacy relationships to keep in mind the importance of athletic skill and subject interest and desire. The presence of advanced skills and a high level of desire should serve to strengthen proposed self-efficacy relationships.

Regarding future sport-related LH applied research, a central issue at this time is properly identifying at-risk athletes. The question of whether LH exists at all types and levels of competitive sport has long been debated by theorists and practitioners. Research by Dweck (1979, 1988) strongly suggests that LH deficits do exist at all levels. Results of the current research suggest this as well. Dweck argued that regardless of skill level, any athlete runs the risk of acquiring LH deficits if he or she does not possess effective coping skills. Elite athletes who succeed a great deal early in life have never needed coping skills because they rarely failed. When they eventually work their way to higher competitive levels, they often lack the coping skills required for persistence in the face of failure. Future

sport-related LH research could examine LH systematically at different levels of skill and developmental ages.

Prapavessis and Carron (1988) found that competitive tennis players were very prone to LH deficit formation. This may be the case because tennis is very public, individually combative in nature, failure oriented, highly complex (tendency is to focus on ability), and requires initiation into the sport at a very early age. All of these factors contribute to the formation of cognitive and motivational LH deficits. Sports that involve similar competitive requirements as tennis (i.e. other racket sports, golf, gymnastics, wrestling, etc.) are also strong candidates for LH reduction research and should be included in future investigations.

Care must be taken when developing a psychological skills training program to teach LH deficit reduction and prevention techniques. Important issues include considering subject age, skill level, aspirations, amount of supervised versus at-home practice, and individual needs of the athletes. Also, when deciding which LH deficit reduction skills to teach, the practitioner should rely heavily on the effectiveness of previous related research. Previous research has strongly supported the use of attribution and self-talk retraining for the reduction of cognitive deficits, and visualization and task-related goal orientation training for the reduction of motivational deficits.

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APPENDICES

APPENDIX A

Test Instruments

First and Last Initial: __/__

(1) Birthday: _____/_____/_____
Month Day Year

(2) Male or Female (Please circle one)

(3) What is your race? (Please circle one) Caucasian (white) / African American / Asian
Native American / Hispanic / Other:_____

(4) At what age did you start playing tennis?___ (5) What is your current state ranking?___

(6) How well do you think you play tennis? (circle one)

X	X	X	X
Poorly (One of the Worst in my Age Group)	**Below Average** (Better than Some in my Age Group)	**Above Average** (Better than Most in my Age Group)	**Very Well** (One of the Best in my Age Group)

(7) How important is it for you to play tennis better than anyone in your age group?

X	X	X	X
Very Important	Somewhat Important	Not Very Important	Not Important At All

(8) How interested are you in learning new skills that will improve your tennis?

X	X	X	X
Very Interested	Somewhat Interested	Not Very Interested	Not Interested At All

(9) Do you know what attribution retraining is? Yes No (circle one)

(10) Do you know what learned helplessness is? Yes No (circle one)

(11) Are your parents divorced? Yes No (12) Separated? Yes No

(13) Do you live with both of your parents? Yes No (circle one)

(14) How many brothers and sisters do you have? _____

(15) How much pressure do you feel to be a successful tennis player:

X	X	X	X
None	Some	Quite a Bit	A Lot

(16) Who is the person who puts the MOST pressure on you to perform well?_____

Initials:__/__
Birthday:__/__/__

Directions

There are no right or wrong answers to the following questions. Read the description of the situation and imagine it has happened to you. When you've decided which response you would be more likely to give, circle it ("a" or "b"). Please don't circle the response you SHOULD give, but instead circle the one you would be more likely to give, even if neither seems to fit perfectly.

1. You get an "A" on a test.
a. I am smart.
b. I am good in the subject that the test was in.

2. You play a game with some friends and win.
a. The people who I played with did not play the game well.
b. I play the game well.

3. You spend a night at a friend's house and you have a good time.
a. My friend was in a friendly mood that night.
b. Everyone in my friend's family was in a friendly mood that night.

4. You go on a vacation with a group of people and you have fun.
a. I was in a good mood.
b. The people I was with were in good moods.

5. All of your friends catch a cold except you.
a. I have been healthy lately.
b. I am a healthy person.

6. Your pet gets run over by a car.
a. I don't take good care of my pets.
b. Drivers are not cautious enough.

7. Some kids that you know say that they do not like you.
a. Once in a while people are mean to me.
b. Once in a while I am mean to other people.

8. You get very good grades.
a. School work is simple.
b. I am a hard worker.

9. You meet a friend and your friend tells you that you look nice.
a. My friend felt like praising the way people looked that day.
b. Usually my friend praises the way people look.

10. A good friend tells you that he hates you.
a. My friend was in a bad mood that day.
b. I wasn't nice to my friend that day.

11. You tell a joke and no one laughs.
a. I do not tell jokes well.
b. The joke is so well known that it's no longer funny.

12. Your teacher gives a lesson you don't understand.
a. I didn't pay attention to anything that day.
b. I didn't pay attention when my teacher was talking.

13. You fail a test.
a. My teacher makes hard tests.
b. The past few weeks my teacher made hard tests.

14. You gain a lot of weight and start to look fat.
a. The food that I have to eat is fattening.
b. I like fattening foods.

15. A person steals money from you.
a. That person is dishonest.
b. People are dishonest.

16. Your parents praise something that you make.
a. I am good at making some things.
b. My parents like some things I make.

17. You play a game and win money.
a. I am a lucky person.
b. I am lucky when I play games.

18. You almost drown when swimming in a river.
a. I am not a very cautious person.
b. Some days I am not a cautious person.

19. You are invited to a lot of parties.
a. People have been friendly toward me lately.
b. I have been friendly toward a lot of people lately.

20. A grown-up yells at you.
a. That person yelled at the first person he saw.
b. That person yelled at a lot of people that day.

21. You do a project with a group of kids and it turns out badly.
a. I don't work well with the people in the group.
b. I don't work well with a group.

22. You make a new friend.
a. I am a nice person.
b. The people whom I meet are nice.

23. You have been getting along well with your family.
a. I am easy to get along with when I with my family.
b. Once in a while, I am easy to get along with when I am with my family.

24. You try to sell candy but no one will buy any.
a. Lately, a lot of children are selling things, so people don't want to buy anything else now.
b. People don't like to buy things from children.

25. You play a game and win.
a. Sometimes I try as hard as I can at games.
b. Sometimes I try as hard as I can.

26. You get a bad grade in school.
a. I am stupid.
b. Teachers are unfair graders.

27. You walk into a door and get a bloody nose.
a. I wasn't looking where I was going.
b. I have been careless lately.

28. You miss the ball and your team loses the game.
a. I didn't try hard while playing ball that day.
b. I usually do not try hard when playing ball.

29. You twist your ankle in gym class.
a. The past few weeks the sports we played in gym class have been dangerous.
b. The past few weeks I have been clumsy in gym class.

30. Your parents take you to the beach and you have a good time.
a. Everything at the beach was nice that day.
b. The weather at the beach was nice that day.

31. You take a bus which arrives so late that you miss a movie.
a. The past few days there have been problems with the bus being on time.
b. The buses are almost never on time.

32. Your mother makes you your favorite dinner.
a. There are a few things my mother will do to please me.
b. My mother likes to please me.

33. A team that you are on loses a game.
a. The team members don't play well together.
b. That day the team members didn't play well together.

34. You finish your homework quickly.
a. Lately I have been doing everything quickly.
b. Lately I have been doing school work quickly.

35. Your teacher asks you a question and you give the wrong answer.
a. I get nervous when I have to answer questions.
b. That day I got nervous when answering questions.

36. You get on the wrong bus and get lost.
a. That day I wasn't paying attention to what was going on.
b. I usually don't pay attention to what's going on.

37. You have a good time at an amusement park.
a. I usually enjoy myself at amusement parks.
b. I usually enjoy myself.

38. An older kid slaps you in the face.
a. I teased his younger brother.
b. His younger brother told him I teased him.

39 You get all the things you want on your birthday.
a. People always guess what things to buy me on my birthday.
b. This birthday people guessed right as to what things I wanted.

40. You take a drive in the country and you have a wonderful time.
a. The country is a beautiful place to be.
b. The time of year that we went was beautiful.

41. Your neighbors ask you over for dinner.
a. Sometimes people are in kind moods.
b. People are kind.

42. You have a substitute teacher and she likes you.
a. I was well behaved during class that day.
b. I am almost always well behaved during class.

43. You make your friends happy.
a. I am a fun person to be with.
b. Sometimes I am a fun person to be with.

44. You get a free ice-cream cone.
a. I was friendly to the ice-cream man that day.
b. The ice-cream man was feeling friendly that day.

45. At a magic show, the magician asks you to help.
a. It was just luck that I got picked.
b. I looked really interested in what was going on.

46. You try to convince a friend to go the movies with you, but he won't go.
a. That day he did not feel like doing anything.
b. That day he did not feel like going to the movies.

47. Your parents get a divorce.
a. It is hard for married people to get along.
b. It is hard for my parents to get along well when they are married.

48. You have been trying to get into a club and you don't get in.
a. I don't get along well with other people.
b. I can't get along well with the people in the club.

CQ

Rate how confident you are about **SERVING** and hitting a target in the service box on the other side of the net (an orange cone) for each of the following goals:

	Your Confidence Level										
	Very Low Confidence				Moderate Confidence						Very High Confidence
1 target hit in 10 tries	0	1	2	3	4	5	6	7	8	9	10
2 targets hit in 10 tries	0	1	2	3	4	5	6	7	8	9	10
3 targets hit in 10 tries	0	1	2	3	4	5	6	7	8	9	10
4 targets hit in 10 tries	0	1	2	3	4	5	6	7	8	9	10
5 targets hit in 10 tries	0	1	2	3	4	5	6	7	8	9	10
6 targets hit in 10 tries	0	1	2	3	4	5	6	7	8	9	10
7 targets hit in 10 tries	0	1	2	3	4	5	6	7	8	9	10
8 targets hit in 10 tries	0	1	2	3	4	5	6	7	8	9	10
9 targets hit in 10 tries	0	1	2	3	4	5	6	7	8	9	10
10 targets hit in 10 tries	0	1	2	3	4	5	6	7	8	9	10

Questionnaire #4

TMAPQ

Directions: Read the question carefully and then circle the one number that is closest to the way you think you are.

1. When you are losing a match, do you focus more on the reasons why you're losing (causes) or on the possible ways you might still win (remedies)?

Only on the Remedies 1 2 3 4 5 6 7 Only on the Causes

2. When you are losing a match, do you find that your strategies to change the situation deteriorate (break down) or become more sophisticated (complex)?

Very Sophisticated 1 2 3 4 5 6 7 Very Deteriorated

3. Before playing, do you expect to win or lose?

I Always Expect to Win 1 2 3 4 5 6 7 I Always Expect to Lose

4. Rate how much better you think you can become as a tennis player.

Much Better 1 2 3 4 5 6 7 No Better

5. How much control do you think you have over your outcome of tennis matches?

Complete Control 1 2 3 4 5 6 7 No Control

6. When you are LOSING a match you're NOT expected to win, do you try harder or have a tendency to give up?

I Try Much Harder 1 2 3 4 5 6 7 I Give Up

7. When you are LOSING a match you ARE expected to win, do you feel you try harder or have a tendency to give up?

I Try Much Harder 1 2 3 4 5 6 7 I Give Up

8. How dedicated are you to becoming a better tennis player?

I Am Extremely Dedicated 1 2 3 4 5 6 7 I Am Not Very Dedicated At All

9. How much do you enjoy competing in tennis matches?

I Love Competing 1 2 3 4 5 6 7 I Hate Competing

10. Rate how good you feel about your tennis match performances?

I Always Feel Good About My Tennis Performances 1 2 3 4 5 6 7 I Never Feel Good About My Tennis Performances

11. Are you happy with your tennis achievements?

Extremely Happy 1 2 3 4 5 6 7 Extremely Unhappy

12. How motivated are you to succeed in tennis?

Very Motivated 1 2 3 4 5 6 7 Very Unmotivated

13. Do you get depressed about how tennis is going for you?

I Rarely Get Depressed 1 2 3 4 5 6 7 I Often Get Depressed

14. How important do you think the results of PAST matches are when predicting FUTURE match success?

Not Important At All 1 2 3 4 5 6 7 Extremely Important

APPENDIX B

Serve Persistence Test Protocol

Full Scale Data Record Sheet and Protocol

1. Stretch: "Stretch your shoulder while I remind you of what we're going to do."
2. Serving Ability: "This test assesses your ability to hit an accurate and hard first serve."
3. Knock Over 3 Different Targets: "Your goal is to knock over 3 different targets in a row with your serve."
4. 1 Out of 25: "Only about 1 out of 25 people your age can do this. Because this is a test, I can't help you."
5. Not Serving Practice: "This is not serving practice. As soon as you either knock over 3 in a row OR become pretty sure you won't be able to do it, you MUST TELL ME and we'll stop."
6. 45 Minutes: "You have about 45 minutes to BOTH hit your serves AND complete the questionnaires. The questionnaires will take about 20 minutes to finish."
7. Questions/Practice: "Do you have any questions? OK, lets start by taking 3 practice serves into the AD court." [Record: (I)n, (O)ut or (H)it ABC; (1) if < foot; (2) if 1-3 feet; (3) if > 3 feet away]

ID#	__/__	__/__	__/__	__/__	__/__	__/__	__/__
Trials	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
P1							
P2							
P3							
Attrib for Fail							
1							
2							
3							
4							
5							
6							
7							
8							
9							
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29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
Self-talk							

8. Finish This Sentence: "I was not able to knock over 3 targets in a row because _____."
9. Questionnaires: "Please complete these questionnaires and return them to the front desk before you leave."
10. Don't Talk: "Please don't talk to anyone about this serving test or the questionnaires."
11. Next Meeting: "Remember to meet me half an hour before your clinic this weekend. THANKS.

APPENDIX C

Intervention Group Log Book

ATS

Advanced Training System

Research Training Program
Packet 1

Designed for: Tennis Players, 1993

REMEMBER: **Bring this to ALL OFF-COURT research related meetings**.

Daily Monitoring Chart

Initials:__/__
Birthday:__/__/__
Week of: _____

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
A> Skills to Practice:							
Visualization Practice (Y or N) (See visualization sheet)							
Used Proper Attributions (Y or N) (Blame lack of practice or lack of effort)							
Made Self-Talk Positive (Y or N) (See "cue word" list for positive words)							
Thought About HOW to Win Instead of Just Winning (Y or N) (Stay in the present)							
B> Rate:							
Your Positive Self-Talk (A-F)							
Your Ability to Stay in the Present (A-F)							
Your Use of Proper Attributions (A-F)							
How Well You Can Visualize (A-F)							
How Motivated You Are to Keep Trying When You Are Struggling at Tennis (A-F)							

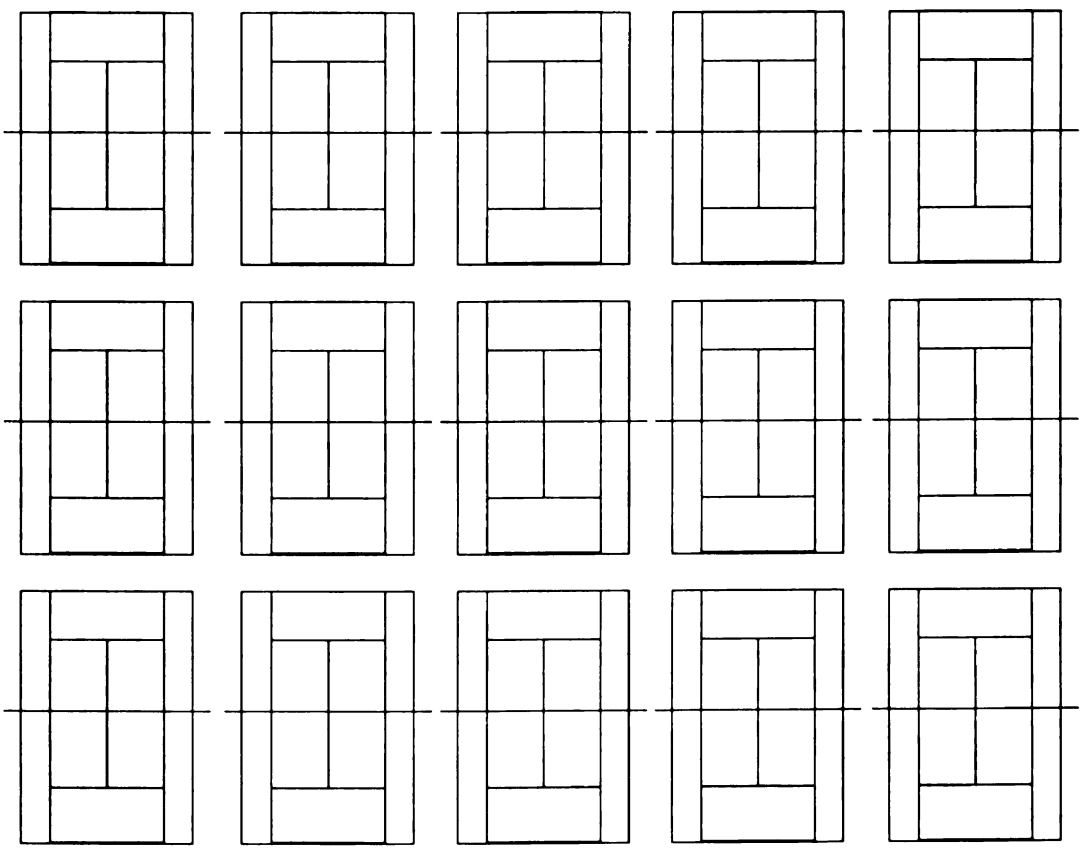
Remember:

1. **Please Be Honest** with your recordings. My research and your progress depends on it.
2. **Please Complete Each Column Daily**: Even if you weren't able to practice all the skills. Obviously, I'd prefer if you could remember to practice each skill daily.
3. **Please Do Not Discuss** the above skills with anyone until the research has been completed. There are others who are learning different skills and you must remain separated from them.

Visualization Practice Sheet

Visualize Yourself Practicing the Following:

	Date:						
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
10 Deuce side serves: line (L), body (B), wide (W)							
10 Ad side serves: line, body wide (see below)							
10 Deuce side second serves							
10 Ad side second serves							
Serve wide; return short crosscourt; approach down the line; pass down the line; volley winner crosscourt (x3); Rate A - F							
Serve wide; return down the line; drive crosscourt; return down the line; drive winner crosscourt (x3) Rate A - F							
Serve middle line; return at you; volley deep down the line; pass crosscourt; volley winner down the line (x3); Rate A - F							
Serve body; short underspin return crosscourt; half volley down the line; high deep lob; overhead winner crosscourt (x3); Rate A - F							



Guided Imagery (or visualization)

What is imagery?

- a picture in our mind, the picture could be a movie and our mind is like a screen;
- you have control over what you want to put on the screen;
- something that should be done along with physical practicing (you can't perform well without actually going onto the court and practicing, but you also need to image in order to play well;
- imagery will help you to do the skills better;

Why do we do it?

- to learn skills or shot sequences;
- to practice skills or sequences;
- to control nervousness (the more times we see it, the more confident we are);
- to help us remember skills or sequences while we are injured (practicing strokes with imagery makes it easier to perform when the injury has healed);

How do we do it?

Sequence:

1) Relaxation:

- close your eyes and get comfortable in a quiet place;
- tense and relax muscles starting with your forehead and ending with your toes;
- breathe slowly and deeply in between contractions;
- as you relax the muscles, say "relax;"
- exhale while you say "relax;"

2) Guided Imagery:

Have a friend read the following passage (or a detailed series of events you make up): "Try to imagine what I look like sitting here, the way that I'm sitting, the color of my clothes. Imagine you stand up, walk out of the room and outside. Try to see the colors and details of things you'd pass on your way out. As you're waiting to cross the road, a red car loses control and comes right toward you. You jump to get out of the way. As you're in the air, the car passes right under you. after you land, you look behind you to see the car smash straight into a silver metal telephone pole. The driver frantically gets out and takes cover behind a big oak tree just before the car explodes."

Even though you probably haven't seen this happen, most people are able to imagine this happening as if they were standing right there. Try to answer the following questions:

1. Did you see the color of the ca? What kind of car was it? Could you see who was driving?
2. Did you feel any emotions (adrenaline) as the car suddenly approached? Did you feel how high you jumped when the car passed under you?
3. Could you feel yourself land? Did you land on your feet?
4. Was it sunny or cloudy, warm or cold, windy or calm?
5. Did you see the color of the telephone pole? Did it fall over after the crash?
6. As the driver fled to safety, could you see if it was a man or woman and what was he/she wearing?

You may have found it difficult, but the more details you can make yourself see in a story like this, the easier it will be to see and control events when you make them up yourself.

Remember:

- you must practice imagery off the court AND while you practice on the court;
- the more relaxed you are, the clearer and more detailed the images will be;
- the better you can see yourself making a difficult shot, the better you'll be able to really do it!
- for practice, try to see things in as much detail as you can in your mind when you are lying in bed.

Goal Training

Proper goal setting increases motivation and self-confidence, improves the quality of practices and clarifies expectations. The key word here is PROPER. Goals must be made so they are attainable (you have complete control), realistic and challenging. The word 'proximal' means short-term, and 'improvement oriented' means that they are measurable. Also, update these goals regularly and consistently to ensure none are forgotten or become obsolete. Use a piece of paper to record your weekly or monthly goals. When you complete a goal, mark the date you did it. Remember, if you had to drive to California, you'd make a lot fewer mistakes if you had a detailed road map. These goals make up your road map, so make the goals detailed!

How to Start

1) Write down as many things as you'd like to be able to accomplish related to your sport.
2) Organize them chronologically from the easiest goal to the goal requiring the most time.
3) Make dividing lines to separate the short-term goals (1 day to 1 month) from the intermediate goals (1 month to 1 year) and long-term goals (1 year to 10 years).
4) Further categorize your goals into "Practice" and "Competition" groups and then into "Technique," "Fitness," and "Mental" goals.
5) Add more precise goals in between your other goals to try to make a steady progression or "staircase" from your easiest goal to your most demanding goal in each group.
6) Review short-term goals daily, intermediate goals monthly and long-term goals every 6 months to ensure they are still realistic and challenging. Delete, add or revise goals as the need arises.
7) Keep old Goal Sheets to remind you of what you've accomplished (self-confidence).

Causal Attribution Grid

Possible Choices When Trying to Answer "WHY" Something Happened:

LUCK (or uncontrollable events) (never use)	TASK DIFFICULTY (or skill of opponent)	
ABILITY (or what you were born with)	***EFFORT*** (or past preparation)	After Success (or doing well)
	After Failure (or errors)	

Attribution Practice Sheet:

After SUCCESS (or winners), I said:		
1. I always do well when my parents watch me play.	GOOD	BAD
2. My coaches have taught me well.	GOOD	BAD
3. I've practices hard and earned the right to play well.	GOOD	BAD
4. I'm a talented player.	GOOD	BAD
5. I was pretty lucky!	GOOD	BAD
6. My opponent is not very good.	GOOD	BAD
7. My opponent is the unluckiest player I've ever seen.	GOOD	BAD
8. My hard work is beginning to pay off.	GOOD	BAD
9. I guess I just play better when it's not windy.	GOOD	BAD
10. I'll just keep working hard and those good shots will come.	GOOD	BAD
After FAILURE (or errors), I said:		
1. My friends told me I couldn't do it and they were right.	GOOD	BAD
2. I always do badly when my match is out of town.	GOOD	BAD
3. The competition was just too good today.	GOOD	BAD
4. I didn't use my ritual between points.	GOOD	BAD
5. I allowed myself to think into the future and past between points.	GOOD	BAD
6. "_____."	GOOD	BAD
7. Keep working.	GOOD	BAD
8. Stay focused.	GOOD	BAD
9. I suck!	GOOD	BAD
10. How could I miss that? I shouldn't miss that!	GOOD	BAD

Proper Attributions Can Greatly Improve Your Performance

After Success
Your explanations should be PERMANENT and NOT SITUATION SPECIFIC:

Examples:
a) I am a BETTER PLAYER than my opponent;
b) It doesn't matter where I play, I'LL DO WELL;
c) The wind or type of court DOESN'T BOTHER ME;
d) I DO WELL against serve and volleyers;
e) I'VE LEARNED to stay in the present during matches;
Why? The above statements increase your confidence and improve the chances of you playing well in the future, no matter what the circumstances.

After Failure
Your explanations should be TEMPORARY and SITUATION SPECIFIC:

Examples:
a) I didn't prepare well for THAT MATCH;
b) My opponent played better than me TODAY;
c) I have not practiced enough YET;
d) I have not learned how to beat serve and volleyers YET;
e) I'm STILL TRYING to learn to control my negative thoughts in matches;
Why? The above statements maintain your confidence (and don't shatter it) and improve the chances that you'll be motivated and optimistic when you play again.

During Competition
Don't attempt to explain why you are winning or losing. Thoughts that stray to the future and past only destroy your current performance. Stay in the PRESENT and focus on physical and mental EFFORT by saying things like:
a) Stay in the present;
b) Stay positive (STOP negatives);
c) I'm a good athlete, keep working hard;
d) I've prepared well, I can do it;
e) Stay calm so you can think clearly;

Attribution Retraining

Attributions are anything one might use to "attribute" or "blame" the results of an event. There are certain attributions that, if used consistently, can significantly alter your effort as well as your performance. Attributions can be thought of as three types, causality, stability and generality. Causality refers to who or what controls the outcome; stability refers to how consistently the person or thing controls the outcome; and generality refers to the number of different situations the person or thing can control the outcome. The best attributions to use are one that are either internal (effort) or external (difficult opponent or situation), unstable (things don't always go wrong), and specific (bad things occur sometimes, but not in every situation).

Attributions like, "I lost because I'm not very talented" are the worst to use because nothing can be done about your lack of talent (if you really do lack talent). Talent is something that is stable (doesn't change) and internal (inside you). Attributions involving luck should also not be used to explain a failure, "I lost because I was unlucky." Luck is another thing that you can't control and therefore should never be used.

The best attributions to use are ones that you can CONTROL, like ones involving effort, "I lost because I didn't practice very hard last month", or "I lost because I didn't try as hard as I could have." Since you can control your effort during a match and your preparation before a match, you have a good chance of improving if you practice harder and prepare smarter! An attribution that is OK

(but not as good as effort ones) is a realistic one that involves the opponent or the situation, "I lost because my opponent was better than I was today."

Remedies for problems should consist primarily of technical information like, "I need to bend my knees," or "I should try to keep my feet moving between shots." However, this kind of self-talk should be done primarily in practice only. The athlete must be able to help him/herself if technical problems arise, but this should rarely need to be done in matches. Attributions should be used mostly after the match to redirect effort and preparation for the next competition.

Self-talk Training

This process will involve recognizing negative or harmful thoughts, stopping them and replacing them with constructive strategies. Being able to recognize the problem will result from effective task analysis and replacing the thought will result from successful self-instruction. In the off-court seminar, you will be asked to remember match situations that you think might stimulate negative or harmful thoughts. A list of adaptive statements will be produced including such statements as, "you've worked hard, you can do it; slow down and concentrate; keep working hard and you'll get the breaks; and, focus on the present."

You will then be helped in the development of trigger words which can quickly return attentional focus as well as adaptive behaviors. Some examples of trigger words are: focus, concentrate, feet, react, quick, positive, flow and control. Remedies for problems will be emphasized instead of causes of

problems. When on the court, remedial task analysis and self-instruction will be emphasized during point-play. Coaches will constantly remind you to analyze the situation and to use trigger words when distractions occur. Any use of maladaptive attributions will be strongly discouraged.

Stay In the PRESENT

PAST	PRESENT	FUTURE
ANGER	ZONE	CHOKE
FRUSTRATION	IMPROVEMENT	NERVOUSNESS

How to Do It:

1. Stay "STOP" to yourself every time you realize your thoughts are not in the present;
2. Use your "cue words" to replace the past, future or self-destructive thought;
3. Stay calm and focused (the more angry and over-aroused you get, the more your thought turn internal (ideal focus is external-narrow) and the harder it is to have control over what you think.

Thought Stopping Sequence

Everyone thinks negative thoughts at times. Only when people learn to recognize negative thoughts, stop them, and replace them with positives will they be able to perform consistently well. If you tell yourself enough times that you are no good, eventually you will be! This is called a self-fulfilling prophecy. Similarly, if you tell yourself you are a good player, you will eventually be this as well.

Use the following sequence to stop negative or self-destructive thoughts:

RECOGNIZE the negative thought	Say "**STOP**"	**REPLACE** with a positive or cue word	Think "**NEXT POINT**"

The following is a list of negatives said after mistakes (so you can recognize what you shouldn't be saying), a list of positives after mistakes (the most important list), and a list of possible cue words to use to replace the negative thought. Feel free to add positive cue words that you like to use during matches.

Negatives After a Mistake			
I suck!	No way!	Choker	I hate tennis
Any 4 letter word	Loser!	Come Ooooon!	That was week
I quit	I'm so bad	You're so bad	You idiot!
You stink	I'm the worst	I'm pitiful	How could I miss?
Why me?	Oh, nice shot!	What was that?	Just don't miss!
That was sooo easy?	Merry Christmas!	Any sarcasm	Ahhhhhh!

Positives After a Mistake		
Next point	Take your time	Keep fighting
Any cue word	Calm down	High percentage
One at a time	Stay tough	Good effort

Cue Words		
Relax	React	Present
Focus	Quick	Fight
Strings	Positive	Breathe

APPENDIX D

Control Group Log Book

ATS

Advanced Training System

Research Training Program
Packet II(a)

Designed for: Tennis Players, 1993

REMEMBER: Bring this to ALL OFF-COURT research related meetings

Daily Monitoring Chart

Initials:___/___
Birthday:__/__/__

Week Of:_____

	Sat	Sun	Mon	Tue	Wed	Thu	Fri
A> Skills to Practice:							
Squeeze Tennis Ball x 100 (Y or N)							
Jump Rope x 250 (Y or N)							
Pushups x 25 (Y or N)							
Situps x 25 (Y or N)							
Proper Stretching Before Playing (Y or N)							
B> Rate: (A - B - C - D - F)							
How strong your hand feels (A-F)							
How well you jump rope (A-F)							
How easy pushups are to do (A-F)							
How flexible you are (A-F)							

Jump Rope Training

The major muscles used for tennis include the stomach and back (all strokes, but especially the serve and overhead), the thighs and butt (groundstrokes and volleys primarily), forearm (all strokes), and calves (all strokes). To strengthen all of them at the same time while preventing overuse injuries, jump rope training can be utilized.

Overuse injuries can occur by doing too much of the same type of activity. When you're on a tennis court, you run. If your only source of off-court training is running, you risk injuring yourself. Jump rope training offers an alternative to running that is less of a shock to the body. The following should be understood before embarking on an extensive jump rope training program:

1) Ten minutes of jumping rope equals 10 minutes of running. If you jump faster raise knees high, it simulates a faster run.

2) Wear tennis or cross-training shoes which give lateral support and have no knobby soles to snag the rope.

3) Avoid jumping on concrete surfaces for more than a couple minutes (like a hard tennis court). Wooden floors, rubber tiles and polyurethane floors are best;

4) Use a rope that fits. Standing with one foot on the middle of the rope, the handles of the rope should just reach your armpits;

5) Practice at moderate speed, turning the rope approximately twice every second from your wrists and forearms. If your arms are making large circles, you're incorrectly using your shoulders;

6) Start by trying to jump for 2 continuous minutes. Each day add 10 seconds until you get to 5 continuous minutes. Once you reach this point, start counting how many times you jump during the five minutes and try to increase the number by at least 10 each day. Try adding several sets as you get in better shape. Also, try variations to jumping with two feet together, such as wide-then- narrow-feet, side-to-side (skiing), right-foot-over-then-right-foot- under, twisting, forward-back-together, forward-back-alternating, jogging-in-place, high-knee-running-in-place, double-rotations, and cross-rotations. Keep track of your jumping in your logbook.

Proper Stretching

The following basic rules for stretching should be followed:

1) Always warm up before stretching (by going for a short jog or jumping rope);

2) Never bounce when stretching;

3) Hold the stretch until you are about to feel pain and then stop;

4) Be consistent about stretching before and after workouts; and

5) Remember not to use any stretches that have been "contraindicated" (outlawed).

Remember to stretch the following muscles: calves, thighs, hamstrings, groin shoulder (3 ways) and back/side.

Importance of Forearm Strength

If you've ever seen professional tennis players up close, you probably noticed the size of their forearms. Most work very hard to build up their hand and forearm muscles so they can serve harder or with more spin, as well as control the racket during other strokes.

The tennis ball you've been given has a cut in it. Use it to strengthen your arm in the following ways:

1) Squeeze the ball with your **thumb and fingers** so the cut in the ball opens and closes. This strengthens the important muscles between your thumb and first finger so you can squeeze the racket tightly at ball contact. A firm racket head means more control and accuracy.

2) Squeeze the ball with your **palm and fingers** so the cut in the ball opens and closes. This strengthens the important muscles in your forearm so you can "pronate" your arm faster on serves and overheads. It also helps you control the racket when hitting groundstrokes and volleys.

Importance of Pushups and Situps

Importance

1) Triceps strength is important on serves and overheads. It also allows you to get extra racket speed when you can't use your body (like a deep overhead).

2) Pectorals strength is important for serves, forehands and volleys. Your arm relies on some kind of strength from this area when hitting each of these strokes.

3) Abdominal (stomach) strength is a vital part of a good serve. When trying to hit a hard serve, the power starts with the legs, builds up to the hips and stomach and eventually reaches the shoulders and arm. This is called the "kinetic chain." The earlier parts of the serve (legs and stomach) must be strong so the later parts (shoulder and arm) can get the racket moving fast.

How and When

1) For pushups, try to keep your hands about shoulder width apart and your back straight. Some people like to do them everyday, but I'd like you to start every other day until you build more strength.

2) For situps, you can either do crunches by keeping the back on the floor and simply lifting the shoulders and head of the ground, or you can do bent knee situps with your arms crossed in front of your chest. Some people like to do several sets of 25-50 each day, but I'd like you to start by doing 25 every other day until you build more strength.

APPENDIX E

Information Given to Parents

Dear Parents,

My name is Bob Neff and I've recently started teaching at the Westfield Tennis Club. The purpose of this letter is to request the participation of your child in the preparation and design of a mental toughness program for the Westfiled Tennis Club. This research has been sponsored by the United States Tennis Association, the Youth Sports Institute and the Sport Research Institute, and has been endorsed by Michigan State University and the other Westfield pros, Spencer and Cam. Participation is free.

What's It About?

This research is designed to test the effectiveness of a psychological skills training program on tennis performance and adaptive thinking. each subject will attempt a challenging tennis-related activity (hitting targets with their serve). Cognitive functioning will be assessed through questionnaires and then they'll be taught several skills to help them think and perform better.

What Will My Child Be required To Do?

The serving test and questionnaires will be given 3 times at two week intervals (pretest, midtest and posttest), each assessment taking a total of 30 minutes. Everyone will be given a logbook and asked to spend a few minutes a day practicing the skills taught. The skills will be taught during a 30 minute session prior to each weekend clinic. So in short, each participant will be asked to:
1) Sign up for and attend three 30 minute testing sessions over a 6 week period;
2) Attend five 30 minute pre-clinic sessions to learn the skills to practice for the next week;
3) Complete the logbook each week by recording what skills were practiced.

What Are the Potential Benefits?

1) Your child will benefit from the free court-time and serving repetition, as well as from learning physical and mental skills valuable for success in tennis and at life. 2) The results of this research will shed light on the development of an effective mental skills training program. 3) The Westfield Tennis Club will receive valuable information about how to instigate a full-time mental toughness training program for juniors and adults.

So, Please Help By Doing the Following:

1) Read and sign the attached consent form;
2) Sign up for the testing times by ranking the 5 best times for your child to be assessed. I'll do my best to schedule you at your preferred time, but will let your son or daughter know for sure the following weekend;
3) Return your 5 preferred meeting times and the signed consent form by next weekend.

Questions?
If you have any further questions about my research, please don't hesitate to call me at home (362-2992) or at Westfield (396-7060). Thank you!

Informed Consent Form A
Michigan State University
Department of Physical Education and Exercise Science

Investigator: Bob Neff

I, _____, hereby agree to participate as a volunteer in a scientific study conducted by Bob Neff, an authorized researcher in the Department of Physical Education and Exercise Science at Michigan State University and Westfield Tennis Club.

The purpose of this experiment is to assess the effectiveness of a mental skills training program on junior tennis players. I will be given several questionnaires that measure my mental toughness, asked to hit several serves and then taken through a 5 week mental skills training program. This program will be built into the on-court training program in which I participate already and will require an extra 30 minutes per session. Prior to each on-court session, there will be a half hour educational workshop followed by the usual on-court training. However, during the on-court training, the coaches, who will have already attended several mental skills training workshops, will reinforce the use of each mental skill. I will receive a personalized 5 week mental skills training program. It will require daily practice on and off the court as well as keeping a daily log. The set of questionnaires will be given again after 2 weeks and 5 weeks. The questionnaires will take approximately 15 minutes to complete and will assess my understanding of mental skills. A sign-up sheet will be sent home so these three assessment periods can be scheduled at the most convenient times for my parents and me.

The study, and my part in the study have been defined and fully explained to me and I understand this explanation. I have been given an opportunity to ask questions I may have had and all such questions and inquiries have been answered to my satisfaction. I understand that my participation in this study does not guarantee any beneficial results to me. I understand that if I am injured as a result of my participation in this research project, emergency medical care will be provided by the tennis facility in the normal fashion. I further understand that if the injury is not caused by the negligence of the researcher or facility staff, I am personally responsible for the expenses incurred as a result of this injury. I understand that any data or answers to questions will remain confidential with regard to identity. Within these restrictions, results of the study will be made available to me at my request. I further understand that I am free to withdraw my consent and discontinue my participation at any time. I will be reminded throughout the program of this right to discontinue participation whenever I choose.

_____	_____	_____
Today's Date	Date of Birth	Subject's Signature

_____
Signature of Parent or Guardian

I, the undersigned, have fully explained and defined the study to the above subject.

_____	_____
Date	Investigator's Signature

Informed Consent Form B
Michigan State University
Department of Physical Education and Exercise Science

Investigator: Bob Neff

I, _____, hereby agree to participate as a volunteer in a scientific study conducted by Bob Neff, an authorized researcher in the Department of Physical Education and Exercise Science at Michigan State University and Westfield Tennis Club.

The purpose of this experiment is to assess the effectiveness of several training programs on junior tennis players. I will be randomly assigned to one training program, given several questionnaires that measure aspects related to tennis performance, and then taken through the 5 week training program. This program will be built into the on-court training program in which I participate already. Prior to each on-court session, there will be a half hour educational workshop followed by the usual on-court training. However, during the on-court training, the coaches will reinforce the use of skills learned off-court. I will receive a personalized 5 week training program. It will require daily practice on and off the court as well as keeping a daily log. The set of questionnaires will be given again after 2 weeks and 5 weeks. The questionnaires will take approximately 15 minutes to complete and will assess my understanding of tennis-related skills. A sign-up sheet will be sent home so these three assessment hours can be scheduled at the most convenient times for my parents and me.

The study, and my part in the study have been defined and fully explained to me and I understand this explanation. I have been given an opportunity to ask questions I may have had and all such questions and inquiries have been answered to my satisfaction. I understand that my participation in this study does not guarantee any beneficial results to me. I understand that if I am injured as a result of my participation in this research project, emergency medical care will be provided by the tennis facility in the normal fashion. I further understand that if the injury is not caused by the negligence of the researcher of facility staff, I am personally responsible for the expenses incurred as a result of this injury. I understand that any data or answers to questions will remain confidential with regard to identity. Within these restrictions, results of the study will be made available to me at my request. I further understand that I am free to withdraw my consent and discontinue my participation at any time. I will be reminded throughout the program of this right to discontinue participation whenever I choose.

_____	_____	_____
Date	Date of Birth	Subject's Signature

_____
Signature of Parent or Guardian

I, the undersigned, have fully explained and defined the study to the above subject.

_____	_____
Date	Investigator's Signature

APPENDIX F

Questionnaire for Coaches

Coach Information

(1) Name:_____ (2) Male or Female

(3) Age:_____

(4) How many years have you coached tennis?_____ Played tennis?_____

(5) Have you ever read a book or article or seen a program about psychological skills training? Yes or No

If yes, which one(s)?

(6) Do you ever practice psychological skills when you play tennis? Yes or No

If yes, list the psychological skills you practice:

(7) Do you ever teach psychological skills to any of your players? Y or N

If yes, list the psychological skills you teach:

(8) List any other psychological skills that you are aware of athletes using:

APPENDIX G

Experimental Preparation and Protocol

Dates	Description of Activity			Weeks Before Start of Data Collection	Week #
3/21	Give info sheet, consent form and pre-test schedule preference sheet for parents and players to sign.			4	1
3/28	Collect signed consent forms and test schedule preference sheets.			3	2
3/28-29	Make test schedule and call each subject to remind them of where and when to meet for testing.			2	3
3/29-4/2	Pre-test (during the week); LH scores calculated; Random group assignments made.			1	4
		PST Group	Placebo Group		
4/4	Experiment starts	Attribution/self-talk and goal setting	Proper Stretching and Jump Rope Training	First Sunday	5
4/11		Attribution/self-talk and visualization training	Proper stretching and strength training	Second Sunday	6
4/12-16	Mid-test (during the week)			Third Week	7
4/18		Attribution/self-talk, goal training and visualization	Proper Stretching and Jump Rope Training	Fourth Sunday	8
4/25		Attribution/self-talk, goal training and visualization	Proper stretching and strength training	Fifth Sunday	9
4/26-30	Post-test (during the week)			Sixth Week	10

APPENDIX H

Manipulation Check Tests

Initials:__/__
Birthday:__/__/__

Group 2 Test

1) I have completed the daily monitoring charts for the past 2 weeks: Y or N
2) I have jumped rope as described in the research packet: Y or N
3) I have been using the cut tennis ball to strengthen my forearm: Y or N
4) I have doing pushups and situps as described in the packet: Y or N

5) After FAILURE, acceptable explanations for the outcome should be:
    a) permanent and not specific to any situation;
    b) permanent and specific to that situation only;
    c) temporary and not specific to any situation;
    d) temporary and specific to that situation only;
6) After SUCCESS, acceptable explanations for the outcome should be:
    a) permanent and not specific to any situation;
    b) permanent and specific to that situation only;
    c) temporary and not specific to any situation;
    d) temporary and specific to that situation only;
7) Examples of acceptable explanations after FAILURE are:
    a) I did not prepare well for this match;
    b) My opponent played better than me today;
    c) I usually do not play well under these circumstances;
    d) a) and b) only;
    e) a), b) and c);
8) Examples of unacceptable explanations after FAILURE are:
    a) I am not a lucky person;
    b) I am not as skilled as my opponent;
    c) I usually do not play well under these circumstances;
    d) a) and b) only;
    e) a), b) and c);
9) Examples of acceptable explanations after SUCCESS are:
    a) I am good;
    b) My opponent is bad;
    c) I was lucky;
    d) My opponent is unlucky;
    e) I played well today;
10) Examples of unacceptable explanations after SUCCESS are:
    a) I am good;
    b) I was lucky;
    c) I played well today;
    d) b) and c) only;
    e) all of the above;
11) If I think into the future during practice and competition, I risk getting:
    a) nervous and choking;
    b) angry and frustrated;
12) If I think into the past during practice and competition, I risk getting:
    a) nervous and choking;
    b) angry and frustrated

APPENDIX I

Variance-Covariance Matrix for Proposed Model

	SE1	ATTRIB1	LH2	SE2	ATTRIB2	LH3	SE3	ATTRIB3	LH1
SE1	2.891								
ATTRIB1	1.846	20.779							
LH2	8.901	15.115	203.128						
SE2	1.602	-0.397	6.534	2.372					
ATTRIB2	1.901	11.984	18.474	0.302	20.420				
LH3	9.996	6.814	169.487	10.359	14.686	284.613			
SE3	1.211	0.820	8.364	1.423	-0.166	10.860	2.472		
ATTRIB3	4.786	9.199	32.821	4.037	18.301	47.567	1.320	35.485	
LH1	12.305	13.045	180.487	8.136	23.532	151.618	9.341	39.690	236.254