CONTEXTUAL AND PERSONAL PREDICTORS OF COPING WITH ANGER IN JUNIOR TENNIS PLAYERS

By

MELINDA R. BOLGAR

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Emotions are an important part of the sport experience. While the study of anxiety in sport has a long and rich history the anger emotion has not been extensively studied. The purpose of this study was to systematically examine the anger construct with competitive junior tennis players. More specifically, this study assessed the prevalence of trait anger in competitive junior tennis players, their coping styles, the number of reported anger outbursts within a specified time period, their cognitive appraisal of a recent anger-arousing event and the relationships among these variables. Furthermore, the study looked to investigate if high trait anger players coped differently with their anger-arousing event than low trait anger athletes, and whether gender differences emerged.

The sample consisted of 103 junior players (51 females and 52 males) with a mean age of 15.3 years and an average Sectional ranking of 94. On average the tennis players had competed for 5 years and played 13 tournaments per year. The majority of the sample was Caucasian (71%). All participants were administered the Adolescent Anger Rating
Scale (AARS), the coping function questionnaire (CFQ), the causal dimension scale (CDS), and a demographic questionnaire.

Results showed that trait anger was not correlated with threat appraisals. Additionally, individuals who scored higher on the anger control anger subscale of the AARS reported using significantly more problem-focused coping, $F(1, 74) = 34.21, p < .01$ ($\eta^2 = .34$) and emotion-focused coping strategies, $F(1, 74) = 9.26, p < .00$ ($\eta^2 = .12$). Additionally, individuals who scored higher on the reactive anger subscale of the AARS reported significantly more anger outbursts ($M = 5.73, SD = 3.04$) than players who scored lower ($M = 2.43, SD = 2.47$), $F(1, 71) = 18.65, p < .00$ ($\eta^2 = .22$). No significant difference in the number of anger outbursts was observed for participants who scored low in anger control on the AARS as compared to those who scored higher on that subscale, $F(1, 79) = 1.95, p < .17$ ($\eta^2 = .02$). Finally, gender differences were observed with regard to the anger control subscale on the AARS as females scored significantly higher than males, $F(1, 74) = 6.13, p < .05$ ($\eta^2 = .08$).

From these findings it can be concluded that levels of trait anger and coping are systematically related with junior tennis players. It would appear that adolescent athletes who are higher on this individual difference variable cope with potentially anger provoking situations in a different manner than those who score lower. Theoretical and applied implications are discussed.
CHAPTER 1
INTRODUCTION

Emotions are a major part of all aspects of the athletic experience. Athletes often face enormous competitive pressures that may culminate in excitement, anger, or disappointment. In spite of these observations, emotions have not been studied extensively in the sport context. With the exception of anxiety (See, e.g., Burton, 1988 and Smith, Smoll, & Wiechman, 1998 for a review of the anxiety literature), other emotions, such as anger, excitement, or joy, have not been extensively studied (Vallerand, 1983). However, one emotion of particular importance to those in sport is anger. For example, in competitive tennis, anger is often manifested through norm-breaking behavior, such as racquet throwing and loud verbal statements either directed towards oneself or others. Within the youth sport context, young athletes often imitate the negative behavior of their professional idols while the simultaneous demands of tennis competition and school often result in extreme emotional outbursts in and out of tennis (Striegel, 1996). The present study will attempt to systematically study the prevalence and correlates of anger in competitive junior tennis.

There are several reasons to continue the study of emotions, specifically anger, in sport. Hanin (1997) stated that "emotion is now recognized to be critically important to understanding many of the core phenomena in virtually every major sub discipline of psychology including clinical, developmental, educational, social and sport psychology" (p. 29). Also "in elite sports emotions can either enhance or impair individual performance, especially under conditions of competitive stress" (p. 30). Due to the
importance of emotions within the sport context (e.g., dropout, burnout symptoms), there is a need to develop a better understanding about how emotions influence adolescent sport competitors and specifically how individuals cope with various emotions (Lazarus, 2000).

Second, there are few studies that have addressed the prevalence and correlates of anger with youth sport participants. In fact, a perusal of the literature revealed that researchers have focused almost exclusively on anxiety to the detriment of other more discrete emotional states. Indeed a recent review of the stress, emotion, and coping constructs in youth sport settings does not even mention the anger emotion (Crocker, Hoar, McDonough, Kowalski, Niefer, 2003).

Third, the long-term consequences of anger reactions have been well documented. Anger has been shown to increase vulnerability to illnesses, compromise the immune system, increase lipid levels, exacerbate pain, and increase the risk of death from cardiovascular disease and from all sources of death (Suinn, 2001). Anger has been found to negatively affect cellular immunity by reducing the number of macrophages and neutrophils and influence pain perceptions (Kiecolt-Glaser, Cacioppo, Malarkey, & Glaser, 1993; Suinn, 2001). Furthermore, it has been suggested that anger is associated with psychological characteristics, such as low social support and high interpersonal conflicts, which affect vulnerability to stress (Smith & Pope, 1990). Lastly it has been proposed that anger as well as health are an expression of underlying biological factors, such as a hyper responsive nervous system or serotonin levels, which can account for poor health risk behaviors (Suinn, 2001).
Finally, a better understanding of the anger construct might allow for intervention efforts with coaches and athletes about how to better understand and manage this emotional state with athletes. For all of these reasons I feel it is important to continue to study the relationship between cognitive appraisals of specific sport situations, anger reactions, and coping.

The model of anger arousal proposed by Novaco (1978, 1979) provides a cognitive-behavioral approach to the explanation and occurrence of anger and will be used as the theoretical framework for this study. The model of anger arousal proposed by Novaco (1978, 1979) predicts that there are four components of anger: the external event, cognitive processes, physiological arousal, and behavioral reactions. Furthermore, state and trait manifestations of anger are posited (Spielberger, 1988). Trait anger refers to the general predisposition of a person to become angry while state anger refers to specific situations in which one gets angry. Individuals who have high levels of trait anger are predisposed to experience more frequent anger reactions, in a greater number of situations, with higher levels of intensity than individuals with lower levels (Spielberger, 1988). Further elaboration on Novaco’s (1978, 1979) model of anger arousal and the work of Spielberger (1988) will be presented in the next chapter.

**Statement of the Problem**

Anger in sport is sometimes quite difficult to control as stated by professional tennis players in Striegel’s study (1993, 1994). Furthermore, it would seem that anger would have a more negative impact on athletes’ performance than positive yet anger outbursts by professional tennis players appear to be quite common. Within the junior tennis ranks the attrition rate is quite high which have lead some to speculate that lack of enjoyment or other negative emotions might be a root cause of this problem (Gould,
Udry, & Tuffey, 1996). Hence, anger may pose a problem to junior tennis players in that it decreases their enjoyment of the game and might predispose them to burnout and/or quitting the sport. While anger is a common emotion experienced during athletics, there has been surprisingly little research conducted on this topic in sports. While a few studies have researched anger in sports (Medberry, 2000; Striegel, 1993, 1994, 1996) most of these studies were qualitative in nature.

**Purposes of the Study**

The general objectives of this study were the following:

To systematically explore the anger construct with competitive junior tennis players. The first major purpose of this study was to assess relationships between the participants’ levels of trait anger, their cognitive appraisals of a recent anger arousing events, the number of self-reported anger outbursts experienced in the last two weeks, and the use of selected coping strategies. For this purpose, it was hypothesized that positive associations between reactive trait anger scores, perceptions of threat, and the number of reported anger arousing events experienced within the specified time period would be observed. Furthermore, it was hypothesized that a positive relationship would be found between trait anger control scores and problem-focused and emotion-focused coping strategies, and perceptions of threat, while a negative relationship would be seen with the number of reported anger outbursts. This was based on findings in previous research studies in the anxiety literature (e.g., Crocker & Graham, 1995; Giacobbi & Weinberg, 2000) and additional theorizing by the principal investigator regarding the cognitive nature of anger emotions within sport settings.

The second purpose of this study was to assess how junior tennis players coped with anger in sport-specific circumstances. More specifically, I assessed differences
between high and low trait anger athletes with regard to how they coped with tennis
specific anger/arousing situations. It was hypothesized that high trait anger tennis players
would experience more frequent tennis specific anger outbursts and use more emotion-focused coping responses as compared to junior tennis players who scored lower on the
trait anger instrument. This hypothesis was based on the findings of Spielberger (1988) in
the anger literature.

Finally, the third purpose of this study was to assess gender differences with regard
to trait anger and coping. Based upon previous literature it was hypothesized that there
would be no gender differences in the level of trait anger. Also, it was hypothesized that
no gender difference would exist in trait anger. Although males are more likely to express
their anger outwardly than females (Thomas, 1993) it is unclear if this difference is
specifically gender based or if it is a socialized difference. Moreover it was hypothesized
that girls would use more emotion-focused coping responses than boys (Frydenberg &

**Significance of the Study**

Competition can be challenging and stressful for even the most experienced athletes. Athletes must learn to cope with a variety of intense emotions. Striegel (1993,
1994) found that even world-class tennis players had experienced many situations in
which they were unable to effectively cope with their anger and these problems resulted
in a diminished performance. Therefore, it would seem important for applied sport
psychologists to develop an understanding of the anger construct in sport and offer ways
in which competitive athletes can more effectively cope with their anger.

Part of the rationale for this study is based on the observation that there is a relative
dearth of research on the role of anger in the context of sport. Two exceptions to this
trend were studies conducted by Striegel (1993, 1994) on the role of anger in the career of professional tennis players. He interviewed nine male professional tennis players. Six major categories emerged from the interviews: a) anger and the developmental years, b) the expression of anger, c) causes of anger, d) effects of anger on performance, d) coping with anger, e) and using anger to one's benefit. The participants mentioned that parents and coaches had a great impact on a young player's tennis, including teaching young people about tennis and what behavior is and is not acceptable on court (Striegel, 1993). The participants also reported that at times emotions were so powerful that becoming angry was unavoidable. The players often expressed their anger verbally and were clear on what type of behavioral expression was within the rules (Striegel, 1993). The causes of anger mentioned by the participants could be divided into uncontrollable and controllable events. Uncontrollable causes included poor conditions, a breakdown in equipment, and poor or inconsistent decisions by officials. On the other hand, the players discussed not having enough time for warm-up, not playing well, and inflated egos as controllable sources of anger. Furthermore, the athletes differentiated between on-court sources of anger, such as fatigue, frustration, and action by the opponent, and off-court causes of anger, which included negative remarks from someone close to the player and perfectionist beliefs.

Moreover Striegel (1994) found that the effects of anger on performance appeared to be more negative than positive as stated by the players. Most often a loss of concentration and an inability to think clearly were discussed as being detrimental to performance. On the contrary, an increase in energy during matches and increased motivation when the opponent was the source of anger were stated as positive influences.
of anger. When asked how players coped with their anger the following strategies were mentioned: increasing awareness of one's personality, maintaining control in practice, and adopting a "realistic" attitude about tennis. Striegel (1994) lastly discussed the category of using anger to one's benefit. The players mentioned that they benefited from the opponent's anger, learning form anger, and used anger as a business tool, such as being humorous about it.

Medbery (2000) also investigated anger development in soccer by applying a contextual model of emotional development (Dupont, 1994). Briefly, the contextual model of emotional development predicts that emotional development is dependent on cognitive development and is closely tied to Piaget’s stages of cognitive development. The latter is a necessary component of emotional development, but in itself not sufficient. Emotional development is characterized by a wide range of emotions and a self-reflective awareness of how that emotion can be directed. Overall, emotions consist of appraisal/feelings, physiological arousal and a response. Different underlying core themes are constructed as people develop which lets people experience different emotions. In Medbery’s study twenty-four soccer players, from three age groups, (e.g., 8 ten year olds, 8 fourteen year olds, and 8 twenty-year-olds, 4 males and 4 females) were interviewed. Each participant was asked about three components of anger: these were how athletes appraised their feelings when getting angry, how/what they felt when being angry, and the behavior that resulted from their anger. Developmental differences regarding age were found for all three components of anger. There was an increase in responses and more elaboration on them regarding appraisal, the energy experience and behavior from the youngest (10-year-olds) to the oldest (20-year-olds) age group. While
there mostly was a noticeable difference between the 10-year-olds and the other two groups, the 14 and 20-year-olds did not significantly differ from each other regarding the assessed three components of anger. Regarding anger appraisal, most of the 10-year-olds anger was related to things being right and wrong, while the 14 and 20-year-olds mentioned categories of "right and wrong", "unfairness", and "should violations". Concerning anger feeling there was no developmental difference among the age groups in the experience of some cognitive turmoil, as well as some type of somatic sensation. However, the two older age groups mentioned that they were not able to concentrate when angry and that they experienced changes in their energy level with anger. For the behavior when angry more of the 14 and 20-year-olds reported themes of controlling their anger than the youngest group. The two older groups also discussed to do something to boost the team and they also took more immediate actions such as yelling at their teammates and coaches when angry than the younger age group. Other themes mentioned for angry behavior were "using anger to advantage, internalizing anger, and doing nothing." Older participants seemed to have a consistent pattern of behavior when angry, but no more responses than the younger participants (Medbery, 2000). However, looking at those differences it is questionable if many of them are really significant, especially between the 14-year-olds and the 20-year-olds. Medberry defined a significant result to be a difference of two or more participants who mentioned previously unmentioned themes. However, because Medbery’s study was a dissertation and due to the qualitative nature of this study, it is difficult to actually discern the specific developmental differences observed by Medbery.
Gender patterns were also examined in Medbery's study (2000) and it was found that the anger appraisal and the anger behavior did not show any gender differences. However, for anger evoking events there was a difference in the 14-year-old age group in which females mentioned anger causing events related to coaches and parents, but did not mention referees or opponents, while for boys it was the other way around. This difference in the 14 year-old group might be due to how boys and girls are socialized and their comfort of with whom it is safe to be angry at that age. Another gender difference was observed for anger feeling. Here again, this was only seen in the 14-year-old age group. Females only mentioned changes in somatic sensation, while males discussed feelings of cognitive turmoil when angry. This might be due to the fact that in our society females are expected to be more in touch with their feelings and emotions than males (Medbery, 2000). Thus, females might not focus on the cognitive aspects when angry, but on what they feel.

Although some studies have been conducted on anger in sport (Medbery, 2000; Striegel 1993,1994), the literature is not as exhaustive in comparison to other emotions such as anxiety and depression. Therefore, a need exists to better understand anger in sport and particularly in youth sport. The results and conclusions from this study will be important and useful to junior tennis players, their parents and coaches as recommendations can be offered about ways to recognize who is prone to anger outburst, situations that may elicit anger, and strategies to cope with anger most effectively. Furthermore, if players can be taught to reduce their anger, and increase fun and enjoyment of the game, it is hoped that the relatively high attrition rate among this age group of tennis players can be decreased (Gould, Udry & Tuffey, 1996). Thus this study
will also yield important information to the United States Tennis Association (USTA) whose mission it is to promote and develop tennis in the United States of America.
CHAPTER 2
REVIEW OF THE LITERATURE

Conceptual and Theoretical Issues on Anger in Sport

As discussed by Ekkekakis and Petruzello (2000), it is imperative that researchers explicitly define affective constructs in physical activity contexts. While it is impossible to exactly define these constructs, a consensus seems to have emerged among cognitively oriented psychologists “that the term emotion should be reserved for those affective states that are elicited following an appraisal process during which a specific object is recognized as having the potential to either promote or endanger the survival or the well-being of the individual” (Ekkakkis et al, 2000; p. 76). In this light, emotions are preceded by an appraisal process where the individual weights the meaning and significance of an event with regard to his or her well-being, goals, or beliefs. The experience of emotion is usually of short duration and high intensity.

On the other hand, moods are thought to lack a specific target (Frijda, 1993, 1994). Furthermore, moods are also considered to be less intense and longer lasting in contrast to emotions (Parkinson et al, 1996). According to Lazarus (1991a) “moods refer to the larger, pervasive, existential issues of one’s life, whereas acute emotions refer to an immediate piece of business, a specific and relatively narrow goal in an adaptational encounter with the environment” (p. 77). For instance, moods are not responses to a specific event, such as the emotion of anger for example, but rather elicit responses of how we see/feel as a whole in general at that particular time period (Frijda 1993, 1994).
Affect is regarded as more generalized and primitive in nature compared to moods and emotions (Gauvin & Spencer, 1998). Affect more specifically refers to the experiential component of all valenced responses, including emotions and moods (Frijda, 1993). For example, a newborn can feel general distress, but cannot yet feel the emotions of anger or sadness, which develop with the ability to appraise events (Ellsworth, 1991). Hence of the three terms, affect is the most general one.

One conceptual distinction that has important implications for the present study concerns broad groupings of affective categories: categorical versus dimensional (Ekkekakis & Petruzello, 2000). A categorical perspective views affective states to be organized into distinct categories comprising states such as anger, fear, sadness, disgust, happiness, love, pride, etc. (Ekman, 1992). In contrast, a dimensional perspective views affective states to be systematically inter-related (Larsen & Diener, 1992) and is often used to study the general nature and the dynamics of affective responses to environmental stimuli (Russell & Feldman-Barrett, 1999). The advantage of a categorical conceptualization is the specificity and the potential for finer distinction of psychological meanings. Hence this perspective allows for studying distinct emotions, such as anger, and allows for more precise measurement of coping responses. This study will employ a categorical perspective and examine anger as a discrete emotion as well as the antecedents of anger reactions in the context of youth sport. The focus will now turn to theoretical viewpoints on emotions in sport with an emphasis on anger.

**Theories of Anger**

Several theories exist which attempt to explain the occurrence of anger. They include early theories on anger, such as sociocultural theory (Patterson, 1985: Sullivan (1953), humanistic theory (Greenberg & Safran, 1989) and behavioral theory (Dollard,
Doob, Miller, Mowrer, & Sears, 1939). Contemporary theories on anger include social learning theory (Bandura, 1986) and cognitive-behavioral approaches (Novaco, 1979). Each theoretical approach will be discussed here. However, this section will begin with a review about the relationship between anger and sport performance.

**Anger and Performance**

The issue of emotional arousal control is very important in sport. This is best illustrated by the ideal performance curve proposed by Yerkes and Dodson (1908). The classic "Yerkes-Dodson Law" hypothesizes that an easily acquired habit, that is, one which does not demand great difficulty or complex associations, may be readily formed under strong stimulation or arousal (Collins, 1990). This hypothesis has been the standard on which much research on athletic performance has been based especially with regard to anxiety and arousal. Unfortunately, this perspective does not differentiate between anger, anxiety, or general arousal which makes it difficult to discern what specific emotions an individual is experiencing when they are highly aroused because arousal is also associated with all other emotions and is necessary for an emotion to occur. Thus, arousal is also seen with anger and hence the Yerkes-Dodson law can also be applied to the anger-arousal-performance relationship.

The Yerkes-Dodson law is often pictured as an inverted "U." In terms of sport application, the inverted "U" indicates that as the performance of a complex skill increases, the amount of arousal needed for the best possible performance increases to an optimal point. However, if a person becomes over aroused, or in other words arousal increases beyond that optimal point, then performance of that skill will begin to decrease. Thus, "the ideal state of emotional arousal for an athlete would be at the apex of the inverted U" (Collins, 1995; p 3). Relating the inverted U to anger means that as anger is
experienced, performance can increase. However, if too much anger is experienced performance will diminish.

The theory of the inverted "U" has been well documented between motor performance and arousal for tasks such as reaction time (Lansing, Schwartz; & Lindsley, 1956), auditory tracking (Stennet, 1957), and hand steadiness (Martens & Landers, 1970). Also, it has been reported that higher levels of arousal are needed in sports that require gross motor activity, such as weightlifting while less arousal is needed for sports that involve fine adjustments in motor activity, as for instance putting in golf (Cox, 1985).

Tennis is considered to be a precision sport. Thus, it is thought that advanced tennis players would require a moderate level of emotional arousal to perform at an optimal level. "Too little arousal would keep the tennis players from being sufficiently active and alert enough to react quickly to changes in speed, rotation, and direction of an oncoming tennis ball, whereas over-arousal could cause over-reactions and maladjustments in motor movement" (Collins, 1990, p 4).

Little research exists on the effects of anger on performance. However, Striegel's (1994) study with nine professional tennis players also examined this aspect of their careers via interview methods. The professionals also thought that behavior on court is now more of an issue of whether the behavior is effective or not in terms of performance and not necessarily if it is socially acceptable. However, it is generally agreed that the effects of anger on performance were more negative than positive. This might point to the fact that athletes who become quite angry are thought to be over aroused leading to a decrease in performance. The negative effects of anger on performance were thought to occur because of a loss of concentration and an inability to think. However, sometimes
the players experienced positive effects of anger, which included an increase in energy for example when bored in a match, and an increase in motivation when the opponent was the cause of anger. According to the players in Striegel’s study, anger can have both positive and negative effects on performance, depending on the situation and the player's ability to manage their emotional response (Striegel, 1994).

Medbery (2000) also examined the effects of anger on performance. However, his sample was youth soccer players and again interview methods were used. In his research three categories emerged regarding the impact of anger on performance: these were performance "depends" on the type of anger, anger "hurts" performance, and anger "helps" performance. With regard to “the performance depends on the type of anger”, performance depended on the intensity of anger and the direction of anger. The intensity of anger appeared to suggest that an optimal level of anger helps performance, however if too much anger was experienced, performance suffered (Medbery, 2000). The direction of anger can be either self-directed or other directed, however there was no clear pattern in this study on how the direction of anger affected performance. The mixed impact of anger on performance referred to the fact that anger could be good for one part of their game, like aggressiveness, but hurt another part, such as their focus.

With regard to gender and age comparisons, no age related differences emerged between the three age groups (10, 14, 20-year-olds) but males mentioned that anger hurt performance more so than females. Males also believed that the anger-performance relationship depended on the intensity of anger. On the other hand, females thought that the anger-performance relationship depended on the direction of anger.
The anger-performance relationship needs to be further examined using quantitative methods due to the limited research in this area. Overall, very limited research exists on how youth athletes cope with anger. Studying competitive junior tennis players and applying cognitive-behavioral theories to the study of anger in sport represents a great opportunity for this area of inquiry.

**Sociocultural Theory**

The sociocultural theory focuses on the consequences of interactions between people within social settings. Anger is believed by some researchers to be an interpersonal phenomenon. Sullivan (1953) proposed that when another person fails to meet one's expectations, anxiety results. Anxiety is replaced by anger as the angry person feels a sense of empowerment. This is especially the case in childhood, as suggested by Sullivan. In adulthood, individuals also direct anger at others who have placed important expectations upon them.

The possible applications of a sociocultural theory to anger in sport are apparent. Parents who place high expectations on young athletes may facilitate the occurrence of anger. Furthermore, research suggests that if a person lives in an angry environment, that person is more likely to display anger (Patterson, 1985). For instance, a junior tennis player may display angry behavior sooner when playing in front of an unsportsmanlike, hostile audience than when playing in front of a "nice" crowd. The sociocultural theory has potential applications to sport by focusing on interpersonal behavior. Hence for instance, an athlete’s anger might be influenced by the high expectations of his/her parents. Thus social and environmental factors can be used to explain the occurrence of anger in sport.
**Humanistic Theory**

Humanists believe that emotions are tools, which function to provide a person with information (Greenberg & Safran, 1989). The Humanistic model emphasizes positive growth and holistic development of personal potential as the primary concern of psychology (Hill, 2001). This emphasis on superior functioning can be viewed as a similarity to many athletes’ aspirations to be the best. The central concept of the humanistic theory is self-actualization, which refers to seeking and acquiring competencies that raise the self to the highest levels of personal attainment and accomplishment. Self-actualization is regarded as an innate force that drives human development and as the primary motivator of human behavior. However, other motivating forces of behavior come from the hierarchy of human needs (Maslow, 1954), which states that needs lowest in the hierarchy, such as physical needs, must be satisfied first by individuals before they can attend to higher needs in the hierarchy, such self-actualization needs. Furthermore, humanists view success as self-determined and not necessarily as winning or losing. “A player is viewed as successful if his/her self-determined aspirations are met during the play, regardless of the final score (p. 121)” (Hill, 2001). Hence, when a person is alerted by the emotion of anger to an injustice or unfair act that has occurred against him/her it is seen as a barrier to self-actualization, which can result in anger. On the other hand, by not viewing success as necessarily winning, but as a self-determined goal, anger might be reduced if players use this mindset and thus this approach seems also to be useful in the treatment of anger problems.

**Behavioral Theory**

Behavioral theories of anger emanate from Skinner’s broader proposed process of operant conditioning (Hill, 2001). From this theory the frustration-aggression hypothesis
evolved in the early literature. This approach considered anger to be a response to the blocking of a goal (Thomas, 1990). Researchers (Dollard, Doob, Miller, Mowrer, & Sears, 1939) believed that anger resulted from the frustration of not receiving what one wanted. The frustration-aggression hypothesis stated that frustration is always the cause of aggression and that aggression was always preceded by frustration (Dollard et al. 1939).

Social Learning Theory

This theory proposes that behaviors can be learned through either direct experience or behavioral observation of others (Bandura, 1973, 1986). Reward and punishment serve as mechanism for learning from direct experience. For instance if a player performs well in a critical situation when angry, the angry behavior is positively reinforced or rewarded, and thus will likely occur again (Striegel, 1996). However, direct experience can also be rewarded or punished by significant others such as parents and coaches. Behavioral observation can also strongly affect young athletes (Bandura, 1986). Junior tennis players often copy their favorite players on court by wearing the same clothes or acting in a similar manner. However, bad habits modeled by star athletes are just as easily picked up by juniors as good habits. Most importantly, parents and coaches have the greatest impact on young athletes, as they are the ones the players spend the most time with. Overall, social learning theory (Bandura, 1973) has potential for application to studies with junior tennis players.

Cognitive-behavioral Theory on Anger

Cognitive-behavioral theory, as applied to anger, has been primarily associated with Novaco's (1979) cognitive model of anger arousal (Striegel, 1996). According to this theory there is no direct relationship between an event and anger. Rather Robinson
(1984) stated that, "arousal is a cognitively mediated process. Expectations and appraisals are designated as the principal classes of cognitions that determine the occurrence of anger" (p 211). The event and the physiological response cannot be changed. However, the individual’s cognitive appraisal of the situation and the ensuing behavior can be changed. Hence, individuals can have a variety of different reactions to the same situations. For example players can react with anger to a double fault on one occasion or with ignorance another time depending on their cognitive appraisal. Furthermore, individuals can choose to imitate their tennis idol at one time but exhibit another behavior on a different occasion. As will be discussed shortly, Novaco’s model of anger/arousal is chosen as the fundamental framework of this study because it is conceptually similar to Lazarus’ (1999) views on the nature of stress, emotion, and coping.

The basis of Novaco's anger arousal model (1978, 1979) is the concept of stress. Novaco (1979) considered anger arousal to be an "affective stress reaction ... a response to perceived environmental demands" (p 252). Stress results when the perceived environmental demands of a situation exceed one's perceived resources available for coping with those demands. Novaco's view of anger relies on expectations and appraisals similar to Lazarus and Folkman's (1984) approach to stress (described below). Novaco's model of anger arousal provides a cognitive-behavioral approach to the explanation of the occurrence of anger. According to Tulloch (1990) the cognitive-behavioral model of anger that Novaco (1978, 1979) developed has become the most influential to date. In the next sections the model of anger arousal will further be explored.

The model of anger arousal by Novaco (1978, 1979) proposed that external events, internal or "cognitive" processes, physiological arousal, and behavioral reactions
determine anger. This means "anger can be examined in terms of aversive events, how these events are appraised or interpreted, and the behaviors that are enacted in response to these events" (Novaco, 1978, p 141). However, external events do not cause anger themselves. Rather their meaning to the person can initiate anger and is obtained through cognitive processes that follow the aversive event. Hence, what makes one person angry may not cause anger for another person.

From Novaco’s perspective, there are three components to the cognitive process of anger: appraisals, expectations, and private speech. Appraisals are defined as cognitive evaluations of past and present events and judgments about one's behavior in response to those events (Novaco, 1978). This is similar to Lazarus and Folkman's (1984) distinction between primary and secondary appraisals of a stressful situation (Tulloch, 1990). The primary appraisal occurs when the external event is first evaluated according to its meaning to the person. For instance, an individual might think, "Is this situation threatening to me?" Next a secondary appraisal occurs where the person makes a judgment about his or her ability to cope with the event. The person might think, "I've been in this situation before" in which case anger may not surface. However, if the event carries significant personal meaning and challenges or exceeds the individual's ability to cope, anger often results (Striegel, 1996). Hence, the event itself does not create anger but the personal meaning of the event to the person and his or her perceived ability to cope with the situation are the reasons for experiencing anger.

A second component to the cognitive process is one's expectations regarding the external event. "Expectations refer to the subjective probabilities that a person has concerning future events" (Novaco, 1978, p 143). Furthermore, anger is influenced by
expectations primarily in three conditions: (1) If a person experiences a high discrepancy between his or her expectations and the particular result or the eventual outcome, anger is more likely to occur, (2) if the person expects or anticipates an aversive event, such as someone misbehaving, anger is more likely to result, (3) when one has low expectations regarding his or her ability to cope with a conflict situation. These conditions are predicted to lead to anger more because individuals will attempt to gain control over the situation. Moreover, a fourth condition was added by Novaco (1979) that which suggests that anger is more likely to occur when a person feels it will help achieve a desired outcome. The last condition has important implications for sports. It basically means that anger outbursts in sports may be intentionally displayed by athletes to influence the opponent or the referee, and in the end the outcome of the contest.

The third component in the cognitive process of anger is private speech (Novaco, 1978). Private speech is defined as "the internal dialogue that expresses appraisals and expectations in language form" (Novaco, 1978, p 144). In essence, private speech serves as an arousal mechanism that can result in anger emotions but also extend the experience of anger. Thus anger is experienced longer than it normally would have been. This point also has considerable implications for athletes. For example players who become angry during their competition and dwell on their negative feelings can experience a higher state of arousal. According to Tulloch (1990) continued worry or rumination about a negative event can hinder a person at attending to the relevant cues in a situation. This might result in a decreased performance for the angry athlete.

After the external event has occurred and has been cognitively processed along with private speech, a state of physiological arousal follows. This physiological response
is subject to cognitive labeling (Novaco, 1978). Physiological arousal includes an increase in heart rate, blood pressure, and muscle tension (Williams, 1999). A physiological response is necessary to be displayed in order for an emotion to occur and this is required for anger. The body is able to integrate its power and attention to the relevant situation with the help of physiological arousal as it acts as an information loop (Medberry, 2000).

Once anger has surfaced, there are primarily four behavioral reactions an individual might have (Novaco, 1978). These are verbal antagonism, physical antagonism, passive aggression, and avoidance withdrawal are conceptually similar to Thomas’ (1993) and Spielberger, Reheiser, and Sydeman's (1995) definitions of behavioral reactions of external expression, internal expression and control of anger. Verbal and physical antagonism refer to overt verbal and physical behavior respectively and can also be looked at as external expression of anger. Passive aggression stands for an individual being angry but displaying his or her anger in other ways than in overt verbal and physical behavior. Passive aggression can be substituted with the internal expression of anger. An example of passive aggressive behavior would be an individual who in general might have a negative attitude and seems angry in different situations, which do not seem to be connected to each other (Striegel, 1996). The fourth behavioral reaction according to the model of anger arousal is avoidance withdrawal. This behavior likely refers to an individual who avoids or disengages from an anger-provoking situation. An example of such a reaction to anger could be a person who appears silent and acts as if nothing happened (Striegel, 1996). Avoidance withdrawal could also be referred to as anger control, as it may be a strategy to cope with anger.
According to Tulloch (1990) situations, which were, anger provoking, the behavior that was displayed in the respective situation and the outcome are remembered by people and this memory affects how they respond to similar events in the future. Moreover, Novaco's model of anger arousal was elaborated on by Tulloch (1990) to completely understand the application of the model. First it was added that anger is not a linear process. This means that anger does not always necessarily start with an anger-eliciting event and end with a behavioral reaction. The components of the model can rather interact with each other in a complex way. Another addition to Novaco's model was the feature that anger does not always need to follow right away after an anger-provoking event. Rather there can be a potential delay of angry emotions. Thus, anger can build up over time and a series of provocations can all of a sudden result in an anger outburst. For instance, an athlete who engages in negative self-talk may dwell upon his or her angry feelings which can lead to a predisposition of becoming angry sooner than normal (Striegel, 1996). The last feature Tulloch (1990) added to the model was the importance of anger to each individual. An individual's perceptions are very important to the experience of anger and are created from the meaning a person attaches to a situation or event. Thus a person does not just get angry for insignificant reasons but rather the cause of one person's anger is not always clear to others, as they do not understand the importance of the event or situation to the angry person.

Overall, the model of anger arousal created by Novaco (1978, 1979) is the single most widely accepted model on anger (Tulloch, 1990). It has been based on the concept of stress, which focuses on the interaction between an individual and the environment (Lazarus & Folkman, 1984). Expectations and appraisals are the two primary cognitive
processes, which are relevant to the experience of stress. "Expectations are established prior to the stressful event regarding the perceived demands of the stressor and the perceived efficacy with which one will be able to cope with the stressor" (Striegel, 1996). A person appraises or evaluates the extent of the demand and also the perceived impact the demand will have on performance after a stressor has been experienced. Then the person compares his or her resources available to meet the demands of the stressor. However, if the individual perceives that one's perceived resources available for coping with the demands do not meet those demands, stress results. Thus appraisals and expectations are very important to the concept of stress and in essence form its basis. Relating the concept of stress to anger Novaco and Robinson (1984) proposed, "expectations and appraisals are designated as the principal classes of cognitions that determine the occurrence of anger" (p 211). Furthermore anger is related to stress in that anger is regarded to be the result of maladaptive attempts at coping with stressful events. It is further suggested that those who do not have the coping mechanisms to deal effectively with the stressor, psychological functioning is inhibited and physical health comprised. Stress, ways of coping with stress or rather anger will be discussed in detail in the following section.

The model of anger arousal (Novaco, 1978,1979) is chosen as the theoretical background for this study for several reasons. First of all it is the most widely accepted theory of anger (Tulloch, 1990). Second Novaco’s model integrates the concepts of stress and coping into a unifying framework. As predicted by both Novaco and the transactional process model of stress and coping (Lazarus & Folkman, 1984), the inability to cope with a certain challenge or situations often leads to stress related emotions (e.g., anger).
Furthermore, both models regard appraisal to precede emotional responses and coping efforts and both models view threat, or in the case of the anger arousal model goal blockage, as an important cause of the resulting emotion. Lastly, both models consider the person and environmental interaction as important determinants of behavioral reactions. Although developmental and/or contextual models of emotion/anger (Dupont, 1994) have been used to study the population, which will also be used in this research, no significant differences have emerged to warrant the application of a developmental model or theory.

The Transactional Process Model of Stress and Coping

The transactional process model (Lazarus & Folkman, 1984) has become one of the most widely accepted theoretical models of the stress and coping process (David, Green, Martin & Suls, 1997). The theory holds that situational appraisals are key determinants of one’s coping and emotional responses. Other perspectives in the extant literature view personality or individual difference variables as important for the stress and coping process (David et al, 1997). What follows is a review of the major predictions of the transactional process model with regard to coping, followed by a review of the major predictions and research findings relevant to this investigation.

Lazarus and Folkman (1984) defined coping as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p 141). The transactional model of stress and coping developed by Lazarus and Folkman (1984) "views the person and the environment in a mutually reciprocal bi-directional relationship that is constantly changing as the nature of the person-environment relationship changes" (Giacobbi & Weinberg, 2000; p 43). For example, one tennis player might focus his or her coping
efforts on talking to the coach or friends about an upcoming match, while another athlete may focus on relaxation and sit quietly by him/herself and these coping efforts may change as the start of the match becomes closer and the demands of the situation change and evolve (Giacobbi & Weinberg, 2000). From this perspective, there are both individual differences and situational demands that influence how athletes cope with stress emotions including anger.

Cognitive Appraisal

The predictions regarding cognition within the transactional-process model are important for this study. Specifically, the model predicts that cognitive appraisals (i.e., primary and secondary) are used to evaluate a situation with regard to what is at stake for the individual (e.g., primary appraisal) and what can be done to alter the situation or change one’s interpretation about what an event means (e.g., secondary appraisal). In other words, stress will not be perceived if an individual does not appraise a situation as being relevant to his or her goals, overall well being, motivational structures, attitudes, or beliefs. Once an individual has appraised a situation as being relevant, three kinds of primary appraisals may occur: harm, threat, and challenge. Harm refers to some damage that has already occurred such as physical, bodily, or psychological. For instance, an injury obtained during competition would be appraised as harm by an athlete, as it would hinder him/her in performing at their best. On the other hand, threat involves the potential for harm that may occur in the future, for example an athlete can perceive the possibility of loosing a match as threatening. Finally, challenge appraisals represent the potential for some significant gain under difficult odds. For example, a tennis player can appraise a match in which he is behind as challenging rather than threatening by thinking about winning the match from behind. This could be extremely difficult to do especially if the
opponent is already close to closing out the match. Hence, this situation presents a significant gain, which is winning the match, but it also requires tremendous effort to do. In any given stressful encounter, one’s cognitive appraisal has an influence on emotional reactions and coping responses (Lazarus & Folkman, 1984; Lazarus, 1999).

The transactional process model next predicts that after an individual has made a primary appraisal, secondary appraisals occur. Secondary appraisals concern evaluations about what a person can actually do to respond to a situation (Lazarus & Folkman, 1984). In other words, secondary appraisals focus on how a person can actually respond to the situation and are determined by one’s experiences, coping resources, and previous exposure to the stressful experience. For instance, an athlete who has appraised a situation as threatening might respond to it by getting angry and venting or instead focusing more on the issue and trying to solve it.

In summary, the major predictions from the transactional process model are that coping is a process influenced by the person as well as the situation, in that appraisals of the situation determine coping and emotional responses. Finally, because this study will assess individual differences involved in the stress and coping process, a brief review of how personality, motivation, and other individual difference variables impact the stress and coping process will be presented.

**Individual Differences in Stress and Coping**

While appraisal is crucial to what kind of emotion is experienced and how the individual is going to cope, the stress appraisal, emotion, and coping process is also influenced by an individual’s personality traits and motives and beliefs about self and the world (Lazarus, 1991). For instance, researchers in the general psychology literature have demonstrated links between the big-five traits of neuroticism, extraversion, openness and
conscientiousness (David et al, 1997). In the sport psychology literature Giacobbi and Weinberg (2000) found that low trait anxious athletes reported different coping behaviors used during a stressful situation than high trait anxious athletes. This finding shows that personality traits can influence coping behavior.

To understand a person’s emotional and coping response fully, the transactional process model accounts for individual differences. These person level variables include (a) beliefs about self and world, (b) personal resources, and (c) goals and goal hierarchies (Lazarus, 1999). First, one’s beliefs about self and the world influence appraisals because of their impact on one’s expectations (Lazarus, 1999). For example, an athlete who has high self-esteem will go into a competition expecting to beat any opponent regardless of how skilled or successful the opponent has been. On the other hand, an athlete with low self-esteem will more likely doubt himself and rather expect to lose.

According to Lazarus (1999), personal resources (e.g. intelligence, money, attractiveness, social skills, social support network, etc.) influence appraisal through their effects on one’s chances for successfully adapting to a stressful encounter. For example, an athlete who has just split with a coach but receives great amount of financial support from sponsors, will be more likely to appraise that situation as less threatening than a “poor” athlete as she will be able to afford a good coach more easily than probably an unsponsored athlete. Hence, the financial security offers the athlete a greater chance to adapt to the stressful situation successfully.

Finally, Lazarus (1999) predicted that goals and goal hierarchies are antecedents of appraisal because situations will be appraised as meaningful if they involve more important goals or commitments. In sport, competitive athletes are most likely highly
committed to their goal, for example becoming the number one in their sport, or winning the most prestigious tournament/meet/race their sport has to offer. Hence, winning might be extremely important to an athlete and anything threatening their chance of winning will more likely be perceived as stressful and appraised as a threat or even harm. Therefore, goals can influence appraisals and coping responses.

Furthermore, the concept of goals/goal hierarchies can very well be linked to the development of anger. As discussed in Novaco’s model of anger arousal, anger often occurs due to goal blockage. In the present study, anger is conceptualized as an individual difference variable and it is hypothesized that high trait anger athletes will differ in regard to how they appraise and cope with tennis specific anger arousing situations compared to low anger players. Hence, just as differences in anxiety levels of athletes can lead to different coping behaviors (Giacobbi & Weinberg, 2000), trait anger is believed to also influence cognitive appraisals of tennis specific situations. Since there has been limited research in the area of anger and coping with anger in athletics, it will be interesting to see if a relationship can be found between different levels of trait anger and coping behaviors in youth tennis players. The following section will discuss the measurement of anger, followed by a discussion of the measurement of coping.

**Measurement of Anger**

One of the problems in the literature regarding anger and the measurement of anger is the conceptual ambiguity and the inconsistent definitions used by researchers. Most confusion is due to using the terms anger, hostility and aggression interchangeably (Berkowitz, 1962; Stearns, 1972). Numerous people have tried to develop a working definition of anger in the past. Feshbach (1964) defined anger as an undifferentiated state of emotional arousal while Kaufman (1970) described this emotion as "an emotion that
involves a physiological arousal state coexisting with fantasized or intended act culminating in harmful effects on another person" (p. 12). According to Stearns (1972) anger is not hostility or aggression, but by suppressing anger it could be replaced by those emotions or behaviors. Thus the confusion between these three terms has been quite evident. Spielberger and colleagues (1983) made the attempt of creating a working definition for all three terms when they constructed the State-Trait Anger Scale (STAS):

They considered anger to be the simplest concept out of these three conditions and referred to anger as an “emotional state that consists of feelings that vary in intensity, from mild irritation and annoyance to fury and rage” (Spielberger, Jacobs, Russell & Crane, 1983; p. 160). While hostility can involve anger, it is seen as aggressive behavior that intends to destroy objects and injure other people. To further elaborate on these three concepts, the term aggression implies destruction and punitive behavior directed at others or objects. However, the terms aggression and hostility are often used interchangeably. To distinguish between these two concepts it is useful to distinguish between hostile and instrumental aggression. While “hostile aggression refers to behavior motivated by anger, instrumental aggression refers to aggressive behavior directed toward removing or circumventing an obstacle that stands between the aggressor and the goal, when such behavior is not motivated by angry feelings” (Spielberger et al, 1983; p. 160). In sport Silva (1978) proposed that an aggressive act is (a) intentional and observable, (b) is committed with the intent to injure, and (c) is personal (e.g., the person committing the act is responsible for the consequences). Thus anger does not necessarily involve or equal aggression and this is particularly true in sport. Therefore, measures designed to assess
anger need to keep these conceptual distinctions in mind. A summary of different anger measures will follow.

Several non-sport-specific measures of hostility, anger, and aggressive behavior have been developed and used in the general psychology literature. One measure that has been extensively used in behavioral medicine and health psychology is the State Trait Anger Expression Inventory (STAXI: Spielberger, 1988). Combining the State-Trait Anger Scale (STAS; Spielberger, Jacobs, Russell, & Crane, 1983) and the Anger Expression (AX) scale formed the STAXI. The STAS assesses the intensity of state anger, as well as the frequency of trait anger, and thus consists of those two subscales. The state anger subscale measures the total score of angry feelings experienced "right now" or at some other given time. The trait anger subscale assesses how one generally feels. Both subscales are rated on 4-point Likert scales. Individuals high in trait anger perceive a wider range of situations as anger provoking and tend to experience more intense state anger in annoying or frustrating situations. Spielberger (1988) added a dimension related to patterns of expression or suppression of anger to the existing two scales. He found that due to an increase in state anger, anger was expressed (anger-out) as aggressive behavior and was externally directed. On the contrary, feelings directed inward resulted in the suppression (anger-in) of anger. Anger-out was defined as "the frequency that an individual engages in aggressive behavior when motivated by angry feelings" whereas anger-in was defined as "how often an individual experiences but does not express angry feelings" (Spielberger, 1988; p. 95). Thus, the purpose of the Anger Expression (AX) scale was to measure the intensity of state anger as well as the frequency with which it was suppressed or expressed. The STAS and the AX scales were
combined to form the State-Trait Anger Expression Inventory (STAXI, Spielberger, Reheiser, & Sydeman, 1995). This measure consists of five primary scales (State Anger, Trait Anger, Anger-in, Anger-out, and Anger-control) that comprise a total of 44 items, and two subscales (trait anger temperament and trait anger reaction).

Validation studies regarding anger-in and anger-out have mainly focused on psychobiological factors, such as blood pressure and pulse rate. It was found that hypertensive individuals scored higher on trait anger/reaction than individuals with normal blood pressure (Crane, 1981). However, one limitation of such studies is that anger-ins and anger-outs are classified based on hypothetical questions. Hence, Spielberger, Krasner, & Solomon (1988) suggested measuring the intensity of real experiences of state anger and the frequency of state anger expressed as anger-in or anger-out. In a study conducted by Deffenbacher (1992) it was found that persons high in trait anger experienced more intense, and more frequent, day-to-day anger than individuals low in trait anger. Persons high in trait anger also showed to have more anger-related physiological symptoms, and reported stronger general tendencies to express or suppress anger, across many provocative situations. Furthermore, Hazaleus and Deffenbacher (1985) found that failure appeared to have a more catastrophizing impact on individuals with high trait anger.

One sport-specific measure of anger/aggression in sport is the Bredemeier Athletic Aggression Inventory (BAAGI: Bredemeier, 1983). This 30-item survey assesses reactive (hostile) aggression, instrumental athletic aggression and overall athletic aggression (Bredemeier, 1983). Researchers have found this inventory to be valid and reliable with athletes (Bredemeier & Shields, 1985; Isberg, 1989). Isberg (1989) conducted a study
with world championship, elite, and youth athletes and compared their responses to the inventory with results from video observations and stimulation-of-recall interviews. High validity was shown for the hostile and instrumental categories, while the overall category showed validity but could be strengthened by additional questions. Thus, inventories need to be more context specific so that it can be determined whether aggressive behavior is encouraged in sport in general or only in particular sports.

Another inventory is the Sport Aggression Questionnaire (Thompson, 1989), which assesses acts of aggression occurring in specific sport situations. It is made up of five subscales: injustice to self, injustice to teammate, frustration, aiding the team, and unprovoked aggression (Ostrow, 1996). This measure was found to have high reliability (alpha value = 0.84) using test-retest procedures.

There also exists an aggression inventory for children; the Scale of Children's Action Tendencies (Bredemeier, 1994). This measure assesses children's behavioral responses to conflict situations in sport. Ten stories are presented and questions are asked, followed by three response alternatives - aggressive, assertive, and submissive- in a paired comparison format (Ostrow, 1996). The aggression subscale has revealed alpha values, which exceed 0.80. However, the submission and assertion subscales had alpha coefficients of 0.66 and 0.68.

To measure the emotion of anger in young tennis players, Striegel (1996) developed the Junior Tennis Anger Questionnaire (JTAQ). The items for this inventory were derived from the general psychology and sport psychology literature on anger and included the following: frequency, intensity, duration, mode of expression, role models, controllability of anger, causes of anger, effects of anger on performance, performance
orientation, and pseudo anger. A group of fifteen 13-17-year olds (9 males, 6 females) pre-tested the instrument for face validity by completing the questionnaire and discussing items, which were unclear to them. A modified Delphi technique (Delbecq, Van de Ven, & Gustafson, 1975) was used to test for content validity and the items were critiqued by four sport psychologists. Construct validity of the questionnaire was examined by having sport psychology graduate students complete a vignette exercise. Participants were asked to complete the inventory twice, taking on the characteristics of the fictitious players: once as a low anger player and then as a high anger player. This exercise was performed to determine if the inventory was able to distinguish between low and high anger players. Construct validity and internal consistency reliability were assessed by administering the questionnaire to 117 11-17-year-olds (54 males, 63 females). Using exploratory factor analysis the integrity of the ten dimensions was determined and new dimensions were generated. To test for test-retest reliability 75 (27 males, 48 females) high school tennis players completed the inventory twice, one week apart from each other and results revealed that only 7 of the 51 items met the 0.70 correlation coefficient criterion, however the test-retest correlation for the entire instrument was 0.86.

The results of exploratory factor analysis revealed six dimensions of anger. The percent of variance in an item explained by these six dimensions was 0.47 with a range of 0.18 to 0.71 of the response variance. The factors were labeled as the experience of anger, antecedents of anger, detrimental effects, adult influences, controllability, and general anger. The experience of anger dimension was the largest one of the categories and contained 18 items.
Overall, instruments to measure anger do exist, but most of the instruments designed for the sport context confuse anger with aggressive behavior such as the BAGGI (Bredemeier, 1975) and the Sport Aggression Questionnaire (Thompson, 1989). With regard to the STAXI (Spielberger, 1988), this measure was validated on adults and is therefore inappropriate for use with youth. While the SCATS (Bredemeier, 1994) is designed to assess anger in children, two of the three subscales have low reliability. Moreover, the JTAQ was a good start to measure and assess the role of anger in tennis. However, the validity and reliability of some of the factors is questionable as several items cross loaded onto multiple components, the sample size for this study was rather small, and a confirmatory factor analysis has not yet been performed on the instrument. Hence due to these limitations of the above-mentioned instruments, a validated anger measure on adolescents will be used in the present study (e.g., Adolescent Anger Rating Scale, Burney, 2001). Next, the measurement of coping will be examined.

Measurement of Coping

Now that the measurement of anger has been discussed, the most important measures of coping will be discussed as well. A measure of coping is the Ways of Coping Checklist (WOCC) (Folkman & Lazarus, 1985). This instrument describes a wide range of behavioral and cognitive strategies that a person might use during a stressful encounter. The WOCC consists of 66 items, each with a four-point Likert scale response format, which comprise eight subscales: problem-focused coping, wishful thinking, detachment, seeking social support, focus on the positive, self-blame, tension-reduction, and keep to self. Overall, test-retest reliability for this scale is acceptable with alpha values being around 0.70 for most of the scales.
A sport-specific measure of coping is the modified COPE (Crocker & Graham, 1995). This measure consists of 12 coping scales, 9 of them coming from a modified version of the COPE (Carver, Scheier, & Weintraub, 1989) instrument and included the following: active coping, seeking social support for instrumental reasons, planning, seeking social support for emotional reasons, denial, humor, behavioral disengagement, venting of emotion, and suppression of competing activities. The other three scales consisted of self-blame, wishful thinking and increasing effort. Each of the 12 scales consisted of four items, each item being scored on a 5-point Likert scale with 1 standing for used not at all/very little and 5 meaning used very much. All of the subscales were found to have alpha coefficients of at least 0.70, except the behavioral disengagement and wishful thinking subscales, which had an alpha coefficient in the low 0.60s. Furthermore, the denial subscale had such a low alpha value that some researchers have decided to eliminate it. Overall, the modified COPE has acceptable reliability values, but could still use further improvement.

Another coping instrument is the Coping Function Questionnaire (CFQ) (Kowalski & Crocker, 2001). It is an 18-item questionnaire, which assesses coping function based on one’s stress appraisal of a situation. Specifically the CFQ assesses three coping functions: problem-focused coping, emotion-focused coping, and avoidance coping. The CFQ has been shown to possess validity as well as reliability. The means and variances for all CFQ items are acceptable and consistent for items within scales. This measure is chosen in this study to evaluate coping and will be further discussed in the Methods section. This measure is chosen, because it has been validated with adolescents and furthermore assesses the three coping functions this study is interested in. Moreover, it
presents good reliability and validity and also displays low social desirability. Next, research findings on coping with stress in sport will be presented.

**Stress and Coping in Sport**

Much research has been conducted on the stress and coping responses of athletes within the last 15 years. For example, Gould et al (1993) examined coping strategies used by national champion figure skaters. Participants in this study were 17 (10 female and 7 male) senior U.S. national champion figure skaters and were interviewed over the phone about their experiences after winning a major competition. The results indicated that the primary sources of stress for these skaters included physical, psychological and environmental demands. Furthermore it was found that these athletes used a wide variety of cognitive and behavioral coping strategies. The skaters displayed emotion-focused and problem-focused coping strategies. For example emotional-coping strategies included social support, negative and positive self-appraisals and ignoring. On the other hand problem-focused strategies included time management and prioritization, training hard and smart and isolation and deflection. Thus the results supported Lazarus and Folkman's (1984) dynamic process oriented view of coping but the authors concluded that the subscales represented by the COPE (Carver, Scheier, & Weintraub, 1989) were most appropriate for research in sport.

Another study using the COPE (Carver, Scheier, & Weintraub, 1989) to investigate coping strategies among elite athletes with and without disabilities was conducted by Pensgaard, Roberts and Ursin (1999). The participants consisted of 69 Olympic athletes and 30 Para Olympians. Their results showed that both groups of athletes used similar coping strategies as assessed by the COPE, such as active coping planning, and denial.
However, the Olympic athletes reported more use of redefinition and growth strategies as assessed by the redefinition and growth subscale of the COPE.

Dale (2000) also examined the coping strategies employed by elite decathletes during their most memorable performances by conducting phenomenological interviews with open-ended questions. He found that the coping strategies employed by athletes also consisted of both emotion-focused coping, such as camaraderie and confidence in training, and problem-focused coping, such as imaging/visualization, being aware of cues, competing only against self and consistency.

A further study was conducted by Dugdale, Eklund and Gordon (2002) on the appraisals and coping of elite athletes in the face of expected and unexpected stressors. A total of 71 athletes described a stressful event that had occurred prior to or during their most important performance. Their results showed that athletes reported the following as being most stressful: injury/illness, negative thoughts, loss of confidence, making mistakes. To deal with their stressful experiences, the participants most frequently used acceptance, increase in effort, and planning as their coping strategy. On the other hand, the least frequently employed coping strategies by these athletes were venting of emotions, humor and denial. Also, a difference was noted in how athletes coped with expected and unexpected stressors. Overall, this study also showed that athletes used both types of coping: problem-focused as well as emotion-focused coping.

Moreover, Pensgaard and Roberts (2003) conducted a study on the relationship between task and ego orientations and the use of coping strategies among Olympic athletes. The sample size consisted of 69 participants out of which only 54 athletes remained for analysis. Results indicated that the use of active coping and social emotional
support was related to high task/low ego orientation, while positive redefinition and growth strategies were related to low task/high ego orientation. Hence achievement goal orientation can play a role on the use of coping strategies by athletes. Achievement goal orientation also falls into the individual differences, which can affect coping behavior, and hence individual differences present an important part of the coping process and response.

Overall, it can be concluded from research done on coping in sport that athletes use a wide variety of coping strategies. They use emotion-focused as well as problem-focused strategies to cope with their stress. While mainly research on adult athletes has been discussed in this section, the next sections will deal with adolescent stress and coping and adolescent athletes and stress and coping.

**Stress and Coping of Adolescents**

Research on the coping strategies of adolescents was conducted by Stark, Spirito, Williams and Guevrement (1989). The purpose of their study was to examine the types of events and experiences that adolescents identify as problems, and to investigate the coping strategies used and their perceived efficacy in managing those problems. A total of 704 students between 14 to 17 years of age completed The Kidcope (Spirito, Stark, & Williams, 1988) to assess their coping strategies. The measure is composed of 10 items, labeled distraction, social withdrawal, wishful thinking, self-criticism, blaming others, problem-solving, emotional regulation, cognitive restructuring, social support, and resignation. The participants were asked to select a problem they had dealt with the prior month and to rate each of the 10 coping items according to the frequency with which they used a particular coping strategy. Furthermore, the adolescents had to indicate how effective they believed the coping strategy was for them.
It was found that males tended to report more school problems, while females reported more interpersonal problems. No significant effects were found for age, sex by age, problem by age, problem by sex, or problem by age and sex on the frequency items of the Kidcope. Overall, it was found that adolescents most commonly experienced problems with school, parents, friends, and boy/girlfriends. The type of problems reported by the different age groups were generally the same, however the groups differed in the frequency of the reported problems. Boys had the most problems with school, while girls reported having most problems with parents. Thus it seems that gender is an important variable mediating the types of events most commonly reported by adolescents and in how such events are perceived. Furthermore the results showed that the use of various coping strategies did not differ by age but the use of social support was reported more frequently by females, while males reported using wishful thinking more often and perceived resignation as a more effective strategy than females.

Another study by Frydenberg and Lewis (1991) also focused on how adolescents cope with their concerns and explored gender differences in the coping process. A total of 650 male and female adolescents aged 16-18 participated in the study. Coping was first assessed by an open-ended questionnaire whereby participants were asked to identify a main concern in their lives and then to describe how they coped with it. All strategies reported were classified into 74 categories by the researchers and interrater agreement had to occur.

Secondly, coping was also measured by the Ways of Coping Checklist (WOCC). This questionnaire is comprised of 66 items and eight subscales of coping: problem-focused, wishful thinking, detachment, seeking social support, self-blame, tension-
reduction, keep to self. However, a modified version of the original was used in which items were changed from the past tense to the present tense, due to the aim of the study to assess the adolescents current concerns.

In general, there were remarkable similarities between the two sexes regarding the use of different coping strategies. However, there were some significant differences concerning emotion-focused coping. Girls reported to engage more in wishful thinking and to use social support more frequently than boys for coping purposes. Furthermore, it was found that there were no gender differences in the level of problem-focused coping strategies. This finding was contrary to other results in the literature, which reported that males use more direct action to alter the problem than females (Stone & Neale, 1984).

Furthermore, Frydenberg and Lewis (1993), in a separate study, investigated how age, gender and ethnicity mediated coping. A total of 673 students (49% male, 51% female) aged 12-17 participated in the study. The Adolescent Coping Scale (ACS; Frydenberg & Lewis, 1993a) was administered to participants to determine their coping strategies and styles. This measure is an 80-item questionnaire, representing 3 broad coping styles: working with and solving the problem (represents attempts to remove the problem through personal endeavor with a minimal use of others, reference to others (the use of others as a resource), and displacement and avoidance strategies (emotion-focused strategies which are empirically associated with a feeling of not coping).

The strategies most frequently used by students were to work, solve problem, and physical relaxation. The least used coping strategies were not coping and seeking professional help. This suggests that adolescents are able to cope with their concerns and problems, as suggested by the high usage of relaxation and physical recreation strategies.
Gender differences emerged for the coping strategies physical recreation, which boys employed more than girls, and the use of social support, wishful thinking and tension reduction, strategies reported more frequently by girls. However, the authors emphasized that boys and girls use problem-focused strategies to the same extent, but seem to differ in the use of emotion-focused coping.

Overall, research conducted on coping of adolescence seems to suggest that gender differences exist. Girls are thought to use more emotion-based coping strategies such as social support and wishful thinking (Frydenberg & Lewis, 1991, 1993). In contrast, both girls and boys are believed to use problem-focused coping the same (Frydenberg & Lewis, 1991, 1993). This latter finding is equivocal as the literature also suggests other findings. On the other hand, no age differences appear to exist regarding the use of various coping strategies (Stark, Spirito, Williams, & Guevremont, 1989). However, these studies were conducted in a non-sport setting. Thus, the coping responses of adolescent athletes will be examined next.

**Stress and Coping of Adolescent Athletes**

Crocker and Graham (1995) examined how competitive athletes coped with stress, the relationship between coping strategies and affect, as well as gender differences with 377 competitive athletes between the ages of 15 and 30. It was hypothesized that problem-focused coping would be positively associated with positive affect while emotion-focused coping would be positively associated to negative affect. Moreover it was proposed that women would report higher levels of seeking social support for emotional reasons, lower levels of problem-focused coping, and higher levels of negative affect compared to men. Coping was assessed by 12 coping scales, 9 of them coming from a modified version of the COPE (Carver, Scheier, & Weintraub, 1989) instrument.
and included the following: active coping, seeking social support for instrumental reasons, planning, seeking social support for emotional reasons, denial, humor, behavioral disengagement, venting of emotion, and suppression of competing activities. The other three scales consisted of self-blame, wishful thinking and increasing effort. Each of the 12 scales consisted of four items, each item being scored on a 5-point Likert scale with 1 standing for used not at all/very little and 5 meaning used very much. Some of the scales were rewritten to adjust them to a sport environment as well as to a 5th grade reading level to make them understandable to all participants.

Crocker and Graham (1995) used performance goal incongruence as a measure of stress, which was defined as whether an athlete was (a) able to perform as well as wanted, or, (b) did not reach the performance goal, or (c) was unable to reach the performance goal. Affect was assessed using the Positive Affect and Negative Affect Schedule (PANAS: Watson, Clark, & Tellegen, 1988), which consists of two scales: positive affect reflecting the level of pleasurable engagement with the environment and negative affect representing general negative valence associated with subjective distress. Each scale was made up of 10 items, scored on a 5-point scale with 1 being not at all and 5 meaning extremely.

The results indicated that problem-focused coping and avoidance coping strategies were employed most often by this sample. Moreover, younger athletes seemed to use more avoidance coping while older athletes appeared to employ more problem-focused coping. Furthermore athletes reported the use of self-blame and social support. Moreover the findings indicated that male and female athletes appraised and coped differently with performance related stress. Females sought more emotional support and showed higher
levels of increased effort. Furthermore, it was implied by the data that positive affect was positively related to problem-focused coping. On the other hand negative affect was positively related to emotion-based coping.

However, certain limitations apply to this data: As mentioned by the authors "emotion is a reaction to meaning, and if the meaning is changed there will also be a change in the subsequent emotion". The ever-changing nature of stress and emotion makes it difficult to determine the effects of coping on emotion in certain situations, especially with using a retrospective measure, which requires athletes to recall experiences and strategies.

Anshel and Delany (1998) conducted a study to identify the sources of acute stress of male and female child athletes. They also attempted to assess the athletes' cognitive appraisals and coping strategies used during competitive sport events. A total of 52 field hockey players, 36 males and 16 females aged 10-12, participated in the study. A structured personal interview technique was used for researching child stress and coping to facilitate recall of events. Furthermore, each structured interview consisted of determining the athlete's sources of acute stress that they encountered during the game, and the cognitive appraisal and coping strategies used in response to each stressor. The majority of the interviews were conducted in person, while a few of them were done over the phone.

Overall, the results suggested that receiving a bad call from the umpire and making a physical game error were the two most often cited sources of stress for athletes. Furthermore, the findings indicated that sources of stress were either appraised as positive or negative, where both males and females appraised stress as negative.
However, males reported significantly more negative appraisals and less positive appraisals than females. Thus the large margin between positive and negative appraisals for males may reflect heightened expectations and pressure to succeed in sport among young male athletes, as compared to their female peers.

Regarding coping behavior, the child athletes in this study also reported the use of a variety of coping responses. Avoidance coping was most frequently used by youth athletes and the two most frequently employed avoidance coping strategies were “concentrating on what to do next” and “trying to forget the stressor”. Interestingly, in this study it was found that the coping strategy of social support was reported equally by both genders. This result is in contrast to previous non-sport research in which females used social support more than males. However it has been suggested previously that "social support would serve as a buffer against stress, particularly among younger athletes whose coping skills are underdeveloped, by providing a more positive interpersonal environment" (Smoll & Smith, 1988).

Limitations of this study include the use of interview methods. Specifically, the interview questions required the participants to remember the competition of the previous week. Thus, instead of immediately assessing sources of stress after the game, the children had to recall situations after several days. This could have altered their memory somewhat and thus data might not be as reliable. Also, by using more than twice as many boys than girls in the sample, this could have lead to some bias in the results, meaning that if equal number of males and females were used the results might have been more similar or even more different, regarding gender differences.
In summary, adolescent athletes use a variety of coping responses and mostly appear to employ problem-focused and avoidance coping strategies. Equivocal findings exist on gender differences and the use of emotion-focused coping strategies in youth athletes. This is in contrast to findings on adolescents in the general psychology literature, where it has been shown that girls tend to use more emotion-focused coping than boys. How young adolescents cope with stress has very important implications on how they cope with anger, as anger is an "affective stress reaction ... a response to perceived environmental demands" (Novaco, 1979; p 252). Next, it will be specifically looked at how athletes/tennis players and adolescent athletes/junior tennis players cope with anger.

**The Role of Anger and Coping with Anger in Sport/Tennis**

While not much research has been done on coping with stress in youth sport athletes, even less has been done on the role of anger and coping with anger in sport. The research becomes especially limited as one looks at anger in youth sport. What follows is a review of some of the studies in this area of inquiry.

Striegel (1993, 1994) conducted a qualitative study with nine professional male tennis players on the role of anger in their tennis careers. The emergent categories included the following: anger in the developmental years, expression of anger, causes of anger, effects of anger on performance, coping with anger, and using anger to one's benefit. Anger in the early years in the professionals' lives was especially impacted from parents and players. Parents and coaches have tremendous influence to mold young players' behavior. While the athletes in this study mostly were told from parents to control their anger and viewed anger as a negative emotion they have seen other parents who wanted their kids to copy behaviors of successful players. "However, the player they
most want their children to emulate, John McEnroe, is known primarily for his outbursts" (Striegel, 1993; p 63). Thus it appears that parent’s expectations and misconceptions about what leads to high-level performance have a great impact on their children's tennis and resulting anger.

The professionals from this study reported that they mostly expressed anger verbally. That was also due to the fact that that form of behavior is not being punished on the tennis-court in contrast to throwing a racquet or hitting a ball out of the court. However, one of the ex-pro's also mentioned that today's players expressed much more anger than those who played while he was on the tour. This participant felt that anger displays are more accepted now and that "this increased presence of outwardly expressed anger has reached the point that if a player doesn't show a lot of emotion on court, the public often interprets the silence as a lack of effort" (Striegel, 1993; p 69). Hence, the open expression of anger has been becoming more prevalent in elite tennis and is also starting to increase at the junior level.

Causes of anger the professionals mentioned ranged from uncontrollable sources of anger such as poor conditions, failure of equipment, and calls of the referee to controllable sources such as arriving late on the site and not "doing one's job" in a match. The players further distinguished between off court sources of anger like having an argument with someone on the day of a match, and on-court sources like fatigue and actions of the opponent. Especially uncontrollable sources of anger seemed to cause anger in the players as they felt that no matter how well they played they wouldn't be able to win the match. However, some of the participants felt that controllable sources of
anger could be even worse in terms of the anger experienced as players indicated they should have been able to control the situation and thus be able to avoid it.

Strategies the professionals used to cope with anger included increased awareness of one's personality, maintaining control in practice, adopting a "realistic" attitude about tennis, and preparing to play opponents who had reputations for expressing anger on court. The players felt that the best way to cope with anger was to match their response to their natural personality, meaning that a player who is fiery shouldn't always keep his anger inside (Striegel, 1994). Another important strategy to cope with anger was to practice maintaining control in practice (Striegel, 1994). The players also mentioned maintaining a realistic attitude as a strategy to cope with anger (Striegel, 1994).

Sometimes players got angry if they could not return a good shot of the opponent because they felt as if they should be able to return every single shot. Finally, the last aspect in which the professional tennis players mentioned anger was how to use it to one's benefit which included themes related to gaining benefits from the opponent's anger and learning from anger.

While Striegel's (1993, 1994) studies were with highly skilled professional tennis players, to date there is no study that investigated anger and coping with junior tennis players. However, Medbery (2000) conducted a study on anger in junior soccer players. Medbery (2000) looked at anger from a developmental perspective and interviewed 24 soccer players from three age groups, 8 ten-year-olds, 8 fourteen-year-olds, and 8 twenty-year-olds, 4 males and 4 females in each group, respectively. Each participant was asked about three components of anger: the feeling/appraisal, the energy experience, and the behavior. In all three components of anger relating to the sport of soccer, developmental
differences were found. For the anger-evoking event the most commonly reported themes were events caused by teammates (not giving 100%), anger caused by coaches (teases), and events directed towards oneself (playing poorly, making stupid mistakes). Events caused by the referee (unfair, poor calls), events caused by other players (dirty play) and events caused by parents (yelling) were also mentioned. Age differences could be seen between the 10-year-old group and the rest of the groups. For anger evoking events there was a gender difference in the 14-year-old age group in which females mentioned anger causing events related to coaches and parents, but did not mention referees or opponents, while for boys it was the other way around. This difference in the 14 year-old group might be due to how boys and girls are socialized and their comfort with whom it is safe to be angry at that age.

As reasons for getting angry participants mainly mentioned anger because something was right/wrong in regards to their held morals, the belief that things should be different as expected, and that things were unfair. Regarding age differences there only appeared to be a difference between the 10-year-old group and the older age groups in the things should be different category, as most of the 14 and 20-year-olds talked about how things should be different as a cause for anger, while only two 10-year-olds mentioned this appraisal. There were no major gender differences in this category.

The energy experience of anger focused on how anger feels. The most commonly reported theme was cognitive turmoil, which was defined as "any type of mental process, or disruption of that process, associated with anger" (Medbery, 2000; p 92), such as loosing concentration, desire to retaliate, and desire to stop playing/giving up. Another commonly mentioned theme was somatic sensation such as feeling tension, increase in
energy, and feeling like crying. Only the older athletes (14 & 20-year-olds) mentioned not being able to concentrate and changes in energy levels associated with anger. There were no major gender differences overall.

Regarding behavior when angry the most commonly reported themes were taking action (yelling at teammates, referee, coach, violence towards objects, aggression towards others), controlling anger (boosting the team, using self-talk), and using anger to advantage (playing harder, trying to score). More of the older participants discussed strategies for controlling anger but did not mention yelling at teammates as much as the youngest group. No gender differences were observed in this category.

Overall, age differences were mainly observed in the emotion of anger between the 10-year-old group and the older groups (14 & 20-year-olds). Although Medbery (2000) mentioned some age related differences between the 14 and 20-year-olds these were disregarded here. This was done because it was thought that the rule of differences in age groups were considered significant if there was a difference of two participants as proposed by Medbery (2000) was not enough. Interestingly, no major gender differences were discovered, only in the 14-year-old age group were some gender patterns seen. A limitation of this study is the small sample size, which leads to some debatable results, such as the age differences according to Medbery (2000).

Hypotheses

To reiterate, this study has the following purposes and hypotheses:

1. To explore associations between the study constructs (e.g., anger, number of anger outbursts, cognitive appraisals towards recent events, and coping). From the work of previous investigations in the anxiety literature (e.g., Crocker & Graham, 1995) and Giacobbi & Weinberg (2000) it was hypothesized that positive associations between
reactive trait anger scores, perceptions of threat, and the number of reported anger
arousing events experienced within the specified time period would be observed.
Furthermore, it was hypothesized that a positive relationship would be found between
trait anger control scores, problem-focused and emotion focused-coping, and perceptions
of threat regarding a recent anger arousing situation, while a negative relationship would
be seen with the number of reported anger outbursts.

2. The second purpose of this study was to compare high versus low trait anger
individuals, as identified by their subscale scores on the AARS, with regard to their use
of problem-focused, emotion-focused, and avoidant coping. It was predicted that high
trait anger participants would experience more frequent tennis specific anger outbursts
and use more emotion-focused coping responses as compared to individuals who scored
lower on the measures of trait anger. This hypothesis was based on the work of
Spielberger (1988) who found that individuals with high levels of trait anger were
predisposed to experience more frequent anger reactions in a greater number of situations
with higher levels of intensity than individuals with lower anger levels.

3. Finally, with regard to purpose three, it has been consistently documented in the
anxiety, stress, and coping literature that females report greater anxiety symptomology
and use more emotion-focused coping responses than males (Crocker & Graham, 1995;
indicated that boys used less emotion-focused coping compared to girls, while both
genders were seen to employ problem-focused coping behavior to the same degree.
Therefore, it was hypothesized that girls would employ more emotion-focused coping
strategies than boys. Also, it was hypothesized that no gender difference would exist in
trait anger. Although males are more likely to express their anger outwardly than females (Thomas, 1993) it is unclear if this difference is specifically gender based or if it is a socialized difference.
CHAPTER 3
METHODS

Participants

Participants for this study were obtained by a convenience sample, meaning the researcher sampled tennis players from a tennis academy/camp which was geographically convenient to her. Eligibility criteria for this study included players between the ages of 11 and 18 with a ranking in their age division of 100 or better in Florida, or had to be nationally ranked in the United States or their home country, respectively. If they had a ranking in a foreign country, they had to be ranked in the top 100 in their age group. This limitation to foreign players' rankings was done to make sure that the level of competitiveness was similar to that of US players because other countries are smaller and hence present fewer players. Furthermore, foreign players from a non-English speaking country had to attend a US high school to make sure that their proficiency of the English language was adequate. Moreover, players who had an ITF ranking also qualified for the study.

The total sample consisted of 103 junior tennis players (52 males and 51 females) aged 11 through 18 years of age. The mean age of the sample was $15.3 \pm 1.61$ years with a mean grade level of 10. The majority of the sample was Caucasian (71.0%) followed by Hispanic (14.6%) and African American (5.8%). The mean sectional ranking of the players was 94 with 16’s as the mean age division, while the mean national ranking of the sample was 206 with the 16’s as the mean age division. Furthermore, the participants had a mean ITF ranking of 538. Moreover, the players had been playing tennis competitively
for an average of 5 years and a range of 12 years and reported to play approximately 13
tournaments per year ranging up to 40 per year. Sample statistics are summarized in

Table 1.

Table 1. Sample Demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
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<tr>
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<td>Grade</td>
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<tr>
<td>Tournaments/Year</td>
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<td>8.46</td>
</tr>
</tbody>
</table>

Measures

Adolescent Anger Rating Scale

The AARS (Burney, 2001) measures anger expression while differentiating between instrumental anger, reactive anger, and anger control. Specifically the AARS is a 41-item self-report measure designed to identify an adolescent's typical mode of anger expression, overall level of anger expression, and anger control. A 4-point Likert scale is used for scoring and each item is rated according to how frequently the behavior typically occurs, ranging from “hardly ever” to “very often.” Instrumental anger refers to delayed or covert anger that can result in a desired and planned goal of revenge and/or retaliation. This scale consists of 20 items and examples of items are “When I am angry I cheat to get even” and “When I am angry I try to hurt someone on purpose”. Instrumental subscale scores range from 20-80, higher scores being representative of greater use of this anger expression mode. However, for the purpose of this study, this scale was not analyzed as it
consists of many items, which are irrelevant to trait anger in sport. Reactive anger is defined as overt anger, meaning that an immediate angry response is displayed to a perceived negative, threatening, or fear-provoking event. Furthermore “reactive anger is marked by deficits in cognitive processing, social skills, and anger control” (Burney, 2001). Example items on this subscale include “When I am angry I act without thinking” and “When I am angry I have a hot temper.” Eight items comprise this subscale and hence subscale scores for reactive anger range from 8 to 32, with a higher score being indicative of greater endorsement of reactive anger. Anger control is characterized by proactive behavior to resolve anger responses. This subscale consists of 13 items which include for example “When I am angry I still make good choices” and “When I am angry I can ignore it when put down by others.” Subscale scores can range from 13 to 52, again a higher score being reflective of greater endorsement of anger control. The AARS was validated on a normative sample of 4,187 11 to 19 year olds representing a diverse group of racial and ethnic backgrounds (Burney, 2001).

Causal Dimension Scale

Anger appraisal was measured with the CDS (Dugdale, Eklund, & Gordon, 2002) that assesses primary and secondary appraisals of a situation. Participants were asked to describe a situation involving tennis, such as a match or practice, in which they became angry. The primary and secondary appraisals of the anger-evoking events were evaluated consistent with the procedures of Dugdale, Eklund, and Gordon (2002). Specifically, a 9-point Likert scale was used to assess primary appraisals. Two single item questions assessed each, challenge and threat appraisals (Folkman & Lazarus, 1980). Challenge and threat appraisal assessment was chosen because those are the most pertaining to the emotion of anger. The participants were asked to indicate on a scale of 1 to 9 (1 equaling
the least degree and 9 equaling the highest degree) the extent to which the anger
provoking event was viewed as “negative and/or threatening” and “positive and/or
challenging” at that instance.

Secondary appraisals were measured by seven items with the same 9-point Likert
scale described above. The participants were asked to describe the extent to which the
anger evoking event they described previously was something that (a) they could change
or do something about, (b) needed to be accepted or gotten used to, (c) they needed to
know more about before they could act, (d) they had to hold themselves back from what
they wanted to do, (e) was manageable by them, (f) was something they could regulate,
and (g) was something over which they had no power.

**Coping Function Questionnaire**

The CFQ (Kowalski et al, 2001) is an 18-item questionnaire, which assesses coping
function based on one’s stress appraisal of a situation. Specifically the CFQ assesses
three coping functions: problem-focused coping, emotion-focused coping, and avoidance
coping. Problem-focused coping is defined as an effort to actively change and remain in
the situation that was causing the stress/anger. Items for this subscale included for
example “I tried to find a way to change the situation” and “I looked for ways to solve
the problem and change the situation.” Emotion-focused coping refers to an effort to
control thoughts or emotions while remaining in the situation that was causing the
stress/anger and included items such as “I stayed in the situation and tried to control my
emotions to better deal with the situation” and “I tried to find ways to control my
emotions.” Lastly, avoidance coping is characterized by an effort to remove oneself from
the situation that was causing the stress/anger (Kowalski et al, 2001). Items representative
of this coping function include “I tried to get away from the situation to reduce the stress”
and “In order to reduce the stress I tried to get myself out of the situation.” Response options for each subscale range from 1 (not at all) to 5 (very often/very much). An overall score for each subscale was obtained by taking the mean of the respective subscale scores. Hence, composite scores for each subscale range from 0 to 5 with 0 indicating that that coping function was not used at all. The CFQ has been shown to possess adequate reliability and validity (Kowalski et al., 2001).

**Number of Anger Outbursts**

This measure consisted of one single item which assessed how often junior tennis players got angry during practice or competition. Players were asked to estimate the frequency of their anger outbursts during a regular week of practice and competition if applicable. Anger outbursts were defined as loud verbal actions, such as yelling, screaming, or swearing, or overt physical actions, such as throwing a racquet, hitting the ground with it, or punching the fence due to being angry or mad at a situation/action that happened previously. Scores ranged from 0 to >10, and players were able to choose from three categories: 0 to 5 times a week (low), 6 to 9 times per week (medium) and 10 or above per week (high). This information was correlated to the results obtained from assessing players' trait anger. Hence, the researcher was able to form a correlation between trait anger and tennis-specific anger, or how trait anger influenced tennis-specific anger.

**Procedure**

An institutional review board approved all methods, measures, and procedures for this study (IRB # 2004 – U - 220). Prior to the start of the study the researcher contacted the director of sports and the head coaches at the tennis academy to explain the purposes of the study and seek permission to recruit participants. The parents of the participants
were also sent letters, and in some cases approached personally, to gain their permission to recruit their children for the study. After permission and informed consent was obtained from participants and their parent, the researcher introduced herself to the athletes and explained the purpose of the study. The players were asked to sign informed consent forms before filling out the actual surveys. Next, the researcher distributed all survey measures described above. The measures were counterbalanced in order to decrease the likelihood of ordering effects and all measures were administered to the players in small groups. Moreover, the researcher also contacted tournament directors of sectional, national and ITF tournaments in the researcher’s geographic region to ask for their permission to recruit players. At the tournament site each player and their parent were approached and asked if they wanted to participate in the study. Survey packets were then distributed to the players and their parent for completion.

**Data Analysis**

Descriptive statistics for all subscales on all measures were computed for the surveys assessed in the present study. The means, standard deviations, and data ranges were examined to assure that all variables were within the appropriate ranges. Next, internal consistency scores (i.e., Cronbach’s Alpha) and bivariate correlations for the subscale scores on the CFQ, the cognitive appraisal measures, number of reported anger outbursts, and the AARS were computed.

Prior to the main analysis, a median split was performed on both AARS subscales. Additionally, Box’s M test was used to test the assumption of homogeneity in the variance/covariance matrices in the dependent variables: this test was not significant indicating acceptance of this assumption. Then, individuals who fell in the upper half of these distributions were then compared to those who fell in the lower half with a
Multivariate Analysis of Variance (MANOVA). Because gender differences have been previously documented in the anxiety and coping literature (Crocker & Graham, 1995; Martens et al., 1990), a 2(Males vs. Females) X 5 (Reactive Anger, Anger Control) MANOVA was calculated using gender, reactive anger, and anger control as fixed factors and problem, emotion, and avoidant coping as dependent variables. An additional 2(High vs. Low Reactive Anger) X 2(High vs. Low Anger Control) ANOVA was computed using the separate AARS subscales as between subjects factors while anger outbursts was the dependent variable.
CHAPTER 4
RESULTS

Descriptive Statistics

The CFQ was used to assess a person’s coping function based on their stress appraisal of the situation they described. As shown in Table 2, sample means for the problem-focused subscale of the CFQ was 3.27 while the emotion-focused and avoidance subscales were 3.29 and 2.75 respectively.

Means and standard deviations for all descriptive statistics are summarized in Table 2. As shown, the means and standard deviations for the AARS subscales were 35.11 ± 7.76 for the anger control subscale and 15.91 ± 5.43 for the reactive anger subscale. For the CDS subscales, the means and standard deviations were as follows: 4.53 ± 2.20 for the threat subscale, 5.72 ± 2.44 for the change subscale, 3.80 ± 2.12 for the challenge subscale, 4.32 ± 2.61 for the acceptance subscale, and 3.58 ± 2.25 for the knowledge subscale.
Table 2. Means (M) and Standard Deviations (SD) for Subscale Scores of the Coping Function Questionnaire (CFQ), the Adolescent Anger Rating Scale (AARS), the Causal Dimension Scale (CDS), and the Number of Anger Outbursts

<table>
<thead>
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<th>Subscales</th>
<th>M</th>
<th>SD</th>
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<td>Problem-focused Coping</td>
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<td>0.81</td>
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<tr>
<td>Emotion-focused Coping</td>
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<td>0.81</td>
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<td>Avoidance Coping</td>
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<td>Reactive Anger</td>
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<td>2.44</td>
<td>0.71</td>
</tr>
<tr>
<td>Challenge</td>
<td>3.80</td>
<td>2.12</td>
<td>0.71</td>
</tr>
<tr>
<td>Acceptance</td>
<td>4.32</td>
<td>2.61</td>
<td>0.71</td>
</tr>
<tr>
<td>Knowledge</td>
<td>3.58</td>
<td>2.25</td>
<td>0.71</td>
</tr>
<tr>
<td>Number of Outbursts</td>
<td>4.08</td>
<td>3.20</td>
<td>-</td>
</tr>
</tbody>
</table>

Reliability of Measures

Internal consistency scores (i.e. Cronbach’s alpha) were determined for each subscale of all measures. The alpha values for the CFQ subscales had good reliability with all alpha values being above 0.8 for the problem-focused, emotion-focused, and avoidance subscales (α = 0.81, α = 0.81, α = 0.87 respectively). The reactive anger subscale of the AARS yielded an alpha value of .82 while the value for the control anger subscale was .77). Finally, the reliability for the Causal Dimension Scale was .71.

Hypothesis 1: Bivariate Correlations

Bivariate correlations for the subscale scores on the CFQ, the cognitive appraisal measures, number of reported anger outbursts, and the AARS are shown in Table 3. As shown, there were significant correlations between the problem-focused subscale of the CFQ and the following subscales of the anger appraisal measure: change, r = .206, and
control, $r = .223$. Furthermore, the problem-focused and emotion-focused subscales of the CFQ were significantly correlated to the control subscale of the AARS, $r = .540$, and $r = .393$, respectively. Hence, positive associations were found between trait anger control scores and emotion-focused and problem-focused coping strategies as hypothesized in hypothesis number one.

Moreover, the change subscale of the anger appraisal measure was significantly correlated to the control and knowledge subscales of this measure, $r = .538$, and $r = .252$, respectively. Also, the change subscale was significantly correlated to the control subscale of the AARS, $r = .281$. Additionally, the challenge subscale was significantly related to the acceptance subscale, $r = .260$, and the knowledge subscale $r = .431$. Also, the reactive anger subscale of the AARS was significantly correlated to the challenge subscale, $r = .294$, to the change subscale $r = .220$, and to the knowledge subscale of the anger appraisal measure, $r = .315$. No subscales of the AARS were significantly associated with the threat subscale of the anger appraisal measure in contrast to the prediction in hypothesis one.

Last but not least, the number of anger outbursts was significantly correlated to the threat, challenge, and knowledge subscales of the anger appraisal measure, $r = .218$, $r = .235$, and $r = .254$, respectively. Also, the number of anger outbursts was significantly related to both, the reactive anger subscale, $r = .603$, and the anger control subscale, $r = -.219$, of the AARS. These results support hypothesis 1 as it was predicted that a positive association would be found between the number of anger outbursts and trait anger (reactive) and a negative relationship would be observed between trait anger (control) and the number of anger outbursts.
Table 3. Correlations for Subscale Scores of the CFQ, CDS, and the AARS

<table>
<thead>
<tr>
<th>Subscales</th>
<th>PFC</th>
<th>EFC</th>
<th>AV</th>
<th>THR</th>
<th>CHN</th>
<th>CON</th>
<th>CHL</th>
<th>ACC</th>
<th>KNO</th>
<th>RA</th>
<th>AC</th>
<th>AO</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFC</td>
<td>1</td>
<td>.630*</td>
<td>.148</td>
<td>.144</td>
<td>.206*</td>
<td>.223*</td>
<td>-.071</td>
<td>-.057</td>
<td>-.184</td>
<td>.540**</td>
<td>-.179</td>
<td></td>
</tr>
<tr>
<td>EFC</td>
<td>1</td>
<td>.221*</td>
<td>-.055</td>
<td>.096</td>
<td>.178</td>
<td>-.023</td>
<td>.092</td>
<td>-.201</td>
<td>-.224*</td>
<td>.393**</td>
<td>-.202</td>
<td></td>
</tr>
<tr>
<td>AV</td>
<td>1</td>
<td>.086</td>
<td>.032</td>
<td>.072</td>
<td>-.049</td>
<td>.100</td>
<td>.004</td>
<td>.095</td>
<td>.031</td>
<td>-.110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THR</td>
<td>1</td>
<td>.319**</td>
<td>.044</td>
<td>.037</td>
<td>.241*</td>
<td>.228*</td>
<td>.198</td>
<td>.060</td>
<td>.218*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHN</td>
<td>1</td>
<td>.538**</td>
<td>.181</td>
<td>.106</td>
<td>.252*</td>
<td>.220*</td>
<td>.281*</td>
<td>.178</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CON</td>
<td>1</td>
<td>.193</td>
<td>.181</td>
<td>.107</td>
<td>.018</td>
<td>.182</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHL</td>
<td>1</td>
<td>.260**</td>
<td>.431**</td>
<td>.294**</td>
<td>.011</td>
<td>.235*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACC</td>
<td>1</td>
<td>.116</td>
<td>.118</td>
<td>.067</td>
<td>.109</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNO</td>
<td>1</td>
<td>.315**</td>
<td>.013</td>
<td>.254*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RA</td>
<td>1</td>
<td>-.157</td>
<td>.603**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC</td>
<td>1</td>
<td>-.219*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AO</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Note. Only values for the upper half of the correlation matrix are shown as the values underneath the diagonal are identical to those in the upper half.

The abbreviations in this table stand for the following: PFC (problem-focused coping), EFC (emotion-focused coping), AV (avoidance coping), THR (threat), CHN (change), CON (control), CHL (challenge), ACC (acceptance), KNO (knowledge), RA (reactive anger), AC (anger control), AO (anger outbursts).

* p < .05. ** p < .01.
Hypotheses 2 and 3: High vs. Low Trait Anger Athletes

In order to test hypotheses 2 and 3, a 2 (High vs. Low Reactive Anger) X 2 (High versus Low Anger Control) x 2 (males versus females) MANOVA was computed using gender and scores on the reactive anger and control subscales as the independent variables and the various coping subscales as the dependent variables. The results are summarized in Table 4 and the findings revealed no significant differences between junior players who scored above the median on the reactive anger subscale of the AARS from those who scored below the median with regard to any of the coping subscales. There were no significant gender differences nor were any of the interactions significant.

However, a significant difference was found between participants who scored high on the anger control subscale of the AARS from those who scored low with regard to problem-focused and emotion-focused coping subscales Wilks’ Λ = .66, F(3, 64) = 11.09, p < .01. Specifically, individuals who scored higher on the anger control anger subscale reported using significantly more problem-focused coping, F (1, 74) = 34.21, p < .01 (η² = .34) than those who scored lower. Additionally, individuals who scored higher on the control anger subscale of the AARS scored significantly higher on the emotion-focused coping subscale, F (1, 74) = 9.26, p < .00 (η² = .12).

Table 4. Mean (M) and Standard Deviation (SD) Scores of Low and High Trait Anger Athletes for Problem-focused Coping (PFC) and Emotion-focused Coping (EFC)

<table>
<thead>
<tr>
<th>Trait Anger</th>
<th>PFC</th>
<th>EFC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Anger Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>14.23</td>
<td>4.11</td>
</tr>
<tr>
<td>High</td>
<td>19.85</td>
<td>3.79</td>
</tr>
<tr>
<td>Reactive Anger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>18.26</td>
<td>4.68</td>
</tr>
<tr>
<td>High</td>
<td>16.06</td>
<td>4.79</td>
</tr>
</tbody>
</table>
With regard to the second analysis, a 2(high versus low anger control) x 2(high versus low reactive anger) analysis of variance (ANOVA) was computed using number of anger outbursts as the dependent variable. The results of this analysis revealed that junior tennis players who scored higher on the reactive anger subscale of the AARS reported significantly more anger outbursts (M = 5.73, SD = 3.04) than players who scored lower (M = 2.43, SD = 2.47), F (1, 71) = 18.65, p < .00 (η² = .22). No significant difference in the number of anger outbursts was found for participants who scored low in anger control on the AARS as compared to those who scored higher on that subscale, F (1, 79) = 1.95, p < .17 (η² = .02).

**Hypothesis 3: Gender Differences**

In order to test hypothesis three, gender differences on the anger and coping scales were tested with a 2 (Males vs. Females) X 2 (Reactive anger vs. Anger control) X 3 (Problem, Emotion, vs. Avoidant Coping) MANOVA using gender as the independent variable and the scores on the AARS and CFQ subscales as the dependent variables. The results of this analysis revealed no gender differences on the subscales for problem-focused coping, emotion-focused coping and avoidance coping on the CFQ and reactive anger on the AARS. With regard to the anger control subscale on the AARS, significant gender differences were observed F (1, 74) = 6.13, p < .05 (η² = .08). Hence, potential interactions between gender and other variables were tested in the remaining analyses. Results regarding gender differences in trait anger are summarized in Table 5.
Hypothesis 1: Bivariate Correlations

The first purpose of this study was to explore associations between the participants’ level of trait anger, their cognitive appraisals of recent anger arousing events, the number of anger outbursts, and the use of selected coping strategies. Results indicated positive associations between the control subscale of the trait anger measure and problem- and emotion-focused coping as predicted by hypothesis one. This means that players who typically controlled their anger better used more emotion-focused and problem-focused strategies, meaning that they tried to cope with their feelings and thoughts during anger arousing events, as well as trying to find a solution to the issue.

In contrast to the first hypothesis no association was found between trait anger (control and reactive) scores and perceived threat regarding the recent anger arousing situations. Hence, junior tennis players do not necessarily feel threatened by the anger arousing events on the tennis court as would be predicted by the cognitive-motivational-relational theory (Lazarus, 1999). While other significant correlations were found with the various single item subscales of the anger appraisal measure, the strength of those relationships was small.

Also predicted in this study were positive associations between trait anger and the number of anger outbursts. This hypothesis proved to be correct, as a strong positive correlation was found between the number of anger outbursts and reactive anger. In other words, individuals who reported a greater number of anger outbursts also tended to score
higher on the reactive anger subscale of the AARS. Also, a negative relationship was
detected between anger control and the number of anger outbursts indicating that
individuals who scored higher on the anger control subscale reported fewer anger
outbursts. Yet, these results appear logical as a player with weak anger control can be
expected to display more of the anger emotion, as well as a player who is high in reactive
anger.

Overall, trait anger control showed a significant positive correlation with problem-
focused and emotion-focused coping and a negative association with the number of anger
outbursts, but showed no relationship with perceived threat. Furthermore, reactive trait
anger also displayed a significant positive correlation with the number of anger outbursts,
but failed to show an association with perceived threat. Moreover, trait anger (control and
reactive) was related to other variables as well, but those associations were rather small.

**Hypothesis 2: Coping Differences Between High versus Low Anger Athletes**

Regarding the second purpose of this study, significant differences between high
and low trait anger athletes were observed with regard to how the participants coped with
tennis specific anger arousing situations. More specifically, significant differences were
found between players who scored lower versus those who scored higher on the anger
control subscale of the AARS with both problem-focused and emotion-focused coping
responses. Players who scored high on the control subscale of the AARS employed
significantly more problem-focused coping and the large effect size estimates for this
finding indicates substantial differences with regard to coping between these groups of
athletes (Cohen, 1988). Additionally, junior tennis players who scored higher on anger
control also reported significantly more emotion-focused coping but the effect size here
was relatively small (Cohen, 1988).
The findings here suggest that low trait anger junior tennis players coped differently with anger provoking situations than high trait anger athletes. From these results it would appear that junior athletes who can control their anger seem to be able to better cope with their anger as they use more problem-focused coping skills than athletes who are unable to regulate their anger emotion as well. This finding is supported by both Novaco and the transactional process model of stress and coping (Lazarus & Folkman, 1984), which predict that the inability to cope with certain challenges or situations often leads to stress related emotions such as anger. In turn, anger is predicted to be the partial result of maladaptive attempts at coping with stressful events. Thus, individuals who do not feel appropriately prepared to cope with anger arousing situations may be more prone to anger outbursts. A future empirical question for researchers would be the extent to which coping skills training programs can lessen the number and extent of anger outbursts experienced by high trait anger junior athletes.

Interestingly, no difference was seen in coping strategies between players who scored low versus high on the reactive anger subscale. It is possible that the median split might have influenced these results if many of the scores were located around the median, which could have been similar and hence no difference would be found between the high versus the low group.

Overall, low trait anger tennis players reported different coping behaviors than high trait anger juniors. Hence, just as differences in anxiety levels of collegiate athletes are associated with different coping behaviors (Giacobbi & Weinberg, 2000), trait anger also seemed to influence coping responses in tennis specific situations as different coping behaviors were observed. This also follows along the notion of the transactional process
model of stress and coping (Lazarus, 1991) that personality traits can influence coping behavior. Thus, the second hypothesis of this study can be accepted in that high trait anger participants used more emotion-focused coping responses as compared to their less angry counterparts. However, it is important to note that high trait anger athletes used more problem-focused coping and used more coping responses in general. Thus, players who controlled their anger better, reported more coping.

Also, pertaining to the second purpose of this study was the large significant difference found between high and low reactive anger players and the number of anger outbursts. Spielberger (1988) found that individuals who have high levels of trait anger are predisposed to experience more frequent anger reactions in a greater number of situations with higher levels of intensity than individuals with lower trait anger levels. The findings of this study supported this notion and the second hypothesis as high trait anger athletes appeared to experience more frequent anger reactions within tennis specific situations. Thus, it could be concluded that trait anger might be able to predict situation specific state anger responses.

However, an interesting finding to note is that no significant differences were found between high and low anger control participants regarding their number of anger outbursts. This is remarkable since junior tennis players high on anger control versus low, were found to cope differently. Yet, no difference in the number of anger outbursts was observed between high vs. low anger control participants. This leads to the conclusion that reactive anger, which is marked by an immediate angry response to a perceived negative event and by deficits in cognitive processing, social skills, and anger control (Burney, 2001) is associated with open expressions of anger. This makes sense as juniors
employing more anger control might also experience the same level of anger as players
low in anger control, but choose not to show it. Hence, while players high in anger
control can minimize their anger by employing problem-focused and emotion-focused
coping strategies, players low on anger control potentially remain angry and since they
are not as good in using coping strategies they may openly display their anger in order to
minimize their stress.

**Hypothesis 3: Gender Differences**

Finally, the last purpose (purpose number three) of this study was to examine
gender differences with regard to trait anger and coping. However, no gender differences
were found for any of the coping subscales nor for the trait anger subscales except for the
anger control subscale, which was only marginal.

When further examined, no gender differences emerged between males and females
who scored high or low on the anger control subscale of the AARS with regard to coping
for all three coping subscales. This means that females who scored low on anger control
coped the same way with their anger provoking situations as low scoring males and vice
versa. Additionally, females who scored higher on the anger control subscale coped
similarly with their anger provoking situations as males. Hence, the slight statistical
gender difference in anger control is negligible and no true gender difference seemed to
exist. This finding is in contrast to findings in the general psychology literature where
adolescent females seem to use more emotion-focused coping strategies than males
(Frydenberg & Lewis, 1991, 1993). In the sport psychology literature equivocal results
have been reported regarding gender differences as Cocker and Graham (1995) found that
boys used less emotion-focused coping compared to girls, while both genders seemed to
employ problem-focused coping behavior the same. However, Smith and Smoll (1988)
found no gender difference regarding coping and hence these results seem to support their findings. The lack of a gender difference in coping might be due to the fact that both, boys and girls, are in an extremely similar situation (competitive match), with similar stressors and identical goals (winning). Hence, their coping strategies might be similar as the focus of the event/situation is the same as compared to an everyday event, where a lot more factors could be in play to interfere with coping. Thus hypothesis three needs to be rejected regarding coping since no gender differences were observed for any of the coping subscales.

While the slight gender difference in anger control seems to support findings on anger in the general psychology literature, such as females are more likely to internalize or control their anger (Thomas, 1993), a significant gender effect was probably not observed due to the fact that both sexes find themselves in a similar situation with identical goals as noted in the previous paragraph. That could also explain why no gender difference was detected for reactive anger. Nonetheless, hypothesis number three regarding the lack of gender differences in trait anger needs to be rejected as there was a slight difference between males and females in respect to anger control.

**Study Limitations and Future Research Directions**

While the present study yielded important findings with regard to anger and coping in youth sport, there are limitations that could be addressed in future studies. To begin, the current sample was recruited out of convenience. Since convenience samples are not truly random, some biases might be present within the current sample.

Another limitation to this study was that the various subscales for anger appraisal were single-item measures, which might not have captured the essence of each construct very well. This is due to the fact that single item measures are unreliable as they cannot
explain a lot of variance. Hence, single item measures are more prone to measurement error, which weakens their relationship with other variables. Thus single items might not be correlated with other measures and therefore could possibly pose a limitation.

Furthermore, while the participants in this study were only asked to recall an event, which had happened during the previous two weeks, the study still involved some recall of events by the junior tennis players, which could have slightly biased the results. The possible inaccuracy in retrospective measurements could be produced by factors such as faulty or incomplete encoding of the event, memory decay resulting from the simple passage of time, or disturbed recollections and self-enhancement tendencies (Smith, Leffingwell, & Ptacek, 1999). Thus, the self-reported levels of coping and trait anger by junior tennis players might be somewhat flawed as retrospective self-report measures were used to obtain data.

Future researchers might investigate the anger experience of athletes immediate following an anger-provoking event instead of using a recall questionnaire. By employing this measurement strategy, difficulties with memory recall could be eliminated. Furthermore, qualitative research could be used to investigate specific anger-arousing situations and the appraisals that go along with them to see what causes anger in this population. These results again could be used to develop anger management techniques for tennis players. Moreover, future studies might opt for a larger and random sample to obtain more generalizable results on junior tennis players. This could be done with the help of organizations such as the United States Tennis Association (USTA) or the International Tennis Federation (ITF). Finally, studies should also investigate the impact of anger on junior tennis players’ performance.
Applied Implications

The results of the present study suggested that teaching athletes coping skills may reduce the number and intensity of junior athletes’ anger outbursts. Indeed the fact that individuals with higher levels of anger control also reported greater use of problem-focused coping strategies suggests such a possibility. Anger control interventions could focus on cognitive appraisals of anger provoking situations or the use of relaxation techniques such as progressive muscle relaxation, mental imagery, or self-talk packages. All these techniques are theoretically derived interventions supported by cognitive and behavioral models of behavior change (See e.g., Hill, 2001) and are also consistent with Novaco’s model of anger arousal (1970) and Lazarus’s (1999) cognitive-motivational relational theory.

As discussed previously, cognitive processes, such as appraisals, are a major part in the development of anger. Hence, by using methods to modify a player’s thoughts and beliefs, the development of anger may be prevented by engaging in problem-focused and/or emotion-focused coping, which could consist of various cognitively based strategies. The goal of cognitive interventions is to identify and modify thoughts that foster undesirable actions and feelings (Hill, 2001). However, unpleasant experiences are not ignored but are rather taught to be viewed as being “temporary, amenable to problem-solving, and open to alternative interpretations” (Hill, 2001; p. 69). Players should be encouraged to logically examine an event from multiple perspectives to prevent them from becoming locked into views of reality that hinder their coping efforts and adjustment to the challenges at hand.

Anger management can also be achieved not only by controlling cognitive processes, but also behavior, which is another huge factor in the development of anger.
and Novaco’s model of anger arousal (1979). “The objective of behavioral interventions is to provide corrective learning experiences in order to substitute self-enhancing behaviors for previously learned maladaptive action patterns” (Hill, 2001; p. 33). The ultimate goal of behavioral techniques would be to achieve self-regulation: the ability to modify and control one’s behavior (Hill, 2001). In this light, goal-setting strategies can be viewed as a form of planning and/or problem-focused coping.

All of the mentioned methods consist of multiple strategies that can be utilized on the tennis court by junior players when they experience anger (e.g. for relaxation: progressive muscle relaxation; cognitive control: thought stopping, imagery). These anger management strategies should help in the control of anger as they correspond to the phases, appraisals, physiological arousal, and behavioral reactions, which determine anger (Novaco, 1979). Moreover, according to the results of this study, teaching anger control should be quite effective in increasing coping responses, such as problem-focused and emotion-focused coping and hence enable junior tennis players to perceive they are in control of their thoughts, feelings, and behaviors. Such perceived control may then allow athletes to divert attentional resources to important challenges on the court.

In conclusion, competitive junior tennis players used a wide variety of coping responses to deal with their anger, which supports the previous literature (Crocker & Graham, 1995; Smoll & Smith, 1988). Most importantly the high trait-anger players used different coping behaviors than their low trait anger counterparts.
APPENDIX A
INSTITUTIONAL REVIEW BOARD APPROVAL

University of Florida Institutional Review Board

TITLE OF PROTOCOL: Coping with anger in competitive junior tennis players

PRINCIPAL INVESTIGATOR: Melinda Bolgar, Graduate student in sport psychology, Department of Exercise and Sport Sciences; 100 Florida Gym, Gainesville, FL 32611-8205, e-mail: m_bolgar@hotmail.com

SUPERVISOR: Dr. Peter Giacobbi, Assistant Professor of Sport Psychology, Department of Exercise and Sport Sciences, 100 Florida Gym, PO Box 118207, Gainesville, FL 32611-8205, phone: 392-0584, ext 324; fax: 392-5262; e-mail: Pgiacobbi@hhp.ufl.edu

DATES OF PROPOSED PROTOCOL: Upon date of permission being granted by Institutional Review Board to August 7, 2004

SOURCE OF FUNDING FOR THE PROTOCOL: None

SCIENTIFIC PURPOSE OF THE PROTOCOL: To investigate the prevalence of anger in competitive junior tennis players and to analyze common coping responses.

DESCRIPTION OF THE RESEARCH METHODOLOGY IN NON-TECHNICAL LANGUAGE: The participants will complete a demographic questionnaire, an anger assessment scale (Adolescent Anger Rating Scale AARS: Burney, 2001), the coping function questionnaire (Crocker & Kowalski, 1998), and a tennis specific anger questionnaire designed specifically for this study. All surveys being used in this investigation are attached to this document. The participants will complete the measures in one sitting and should take approximately 30 minutes to complete.

POTENTIAL BENEFITS AND ANTICIPATED RISK: Research participants may gain insights about the events that make them angry and how they deal with their anger. No more than minimal risks are anticipated from participants in this study.

DESCRIBE HOW PARTICIPANTS WILL BE RECRUITED, THE NUMBER AND AGE OF THE PARTICIPANTS, AND PROPOSED COMPENSATION (IF ANY): The primary investigator, who is a graduate student in sport psychology, will be recruiting participants from several tennis academies in Florida. Participants will be junior tennis players, age 14-17 who are ranked in any state of the U.S in the top 100 of their age group, or have a national ranking in the U.S. or if foreign, their home country. Approximately, 200 junior tennis players will be recruited.

DESCRIBE THE INFORMED CONSENT PROCESS. INCLUDE A COPY OF THE INFORMED CONSENT DOCUMENT (SEE ATTACHED INFORMED CONSENT DOCUMENT). Participants and their parents will be presented with a written informed consent (see attached).

Principal Investigator’s Signature

Supervisor’s Signature

Department Chair’s Signature and Date
TO: All Parents/Guardians of Research Participants
FROM: Melinda Bolgar (Principal Investigator)
Dr Peter Giacobbi (Supervisor)
RE: Informed Consent

STUDY TITLE: Coping with anger in competitive junior tennis players

PURPOSE OF THIS STATEMENT: The purpose of this statement is to summarize the study I am conducting, explain what I am asking your child to do, and to assure you that the information your child and other participants share will be kept completely confidential to the extent permitted by law. Specifically, nobody besides the Principal Investigator will be able to identify your child in this study and your child’s name will not be used in any research reports that result from this project. The purpose of this project is to help us understand how junior tennis players cope with anger and what (positive or negative) influences it has upon them and their tennis game.

WHAT YOUR CHILD WILL BE ASKED TO DO: If you agree to let your child participate in this study, he/she will be asked to complete a survey that will take approximately 30 minutes to complete. Your child does not need to answer any question they do not wish to answer. Please e-mail the completed consent form back to the following address: m_bolgar@hotmail.com.

TIME REQUIRED: Approximately 30 minutes

RISK AND BENEFITS: There are no risks expected from participating in this study. As a result of participation, your child may develop insights about his/herself that could help his/her future development in tennis and life.

COMPENSATION: No compensation is given as a result of this study.

CONFIDENTIALITY: Your child’s identity will be kept confidential to the extent provided by law. Your child’s completed survey will be assigned a code number and all surveys will be kept in my supervising professor’s office (Room 124, Florida Gym, University of Florida) in a locked file cabinet. Your child’s name will not be used in any report.

VOLUNTARY PARTICIPATION: Your child’s participation in this study is completely voluntary. There is no penalty for not participating. By completing the survey your child acknowledges his/her consent to voluntarily participate in this study.

RIGHT TO WITHDRAW: Your child has the right to withdraw from the study at anytime without consequence.

WHOM TO CONTACT IF YOU HAVE QUESTIONS ABOUT THIS STUDY: Melinda Bolgar, 29147 Bay Hollow Dr 3219, Wesley Chapel, FL 33543; phone: (813) 973-1111 ext. 3219; e-mail: m_bolgar@hotmail.com.
AGREEMENT:

I have read the procedure described above. I give my child permission to voluntarily participate in the procedure and I have received a copy of this description.

Parent/Guardian of Participant: ____________________________ Date: ____________
INFORMED CONSENT
PLEASE READ THIS WHOLE DOCUMENT CAREFULLY BEFORE YOU DECIDE PARTICIPATE IN THIS STUDY

TO: All Research Participants
FROM: Melinda Bolgar (Principal Investigator)
        Dr Peter Giacobbi (Supervisor)
RE: Informed Consent

STUDY TITLE: Coping with anger in competitive junior tennis players

PURPOSE OF THIS STATEMENT: The purpose of this statement is to summarize the study I am conducting, explain what I am asking your you to do, and to assure you that the information you share will be kept completely confidential to the extent permitted by law. Specifically, nobody will be able to identify you in this study and your name will not be used in any research reports that result from this project. The purpose of this project is to help us understand how junior tennis players cope with anger and what (positive or negative) influences it has upon them and their tennis game.

WHAT YOU WILL BE ASKED TO DO: If you agree to let participate in this study, you will be asked to complete a survey that will take approximately 30 minutes to complete. You do not need to answer any question you do not wish to answer.

TIME REQUIRED: Approximately 30 minutes

RISK AND BENEFITS: There are no risks expected from participating in this study. As a result of participation, you may develop insights about yourself that could help your future development in tennis and life.

COMPENSATION: No compensation is given as a result of this study.

CONFIDENTIALITY: Your identity will be kept confidential to the extent provided by law. Your completed survey will be assigned a code number and all surveys will be kept in my supervising professor’s office (Room 124, Florida Gym, University of Florida) in a locked file cabinet. Your name will not be used in any report.

VOLUNTARY PARTICIPATION: Your participation in this study is completely voluntary. There is no penalty for not participating. By completing the survey you acknowledge your consent to voluntarily participate in this study.

RIGHT TO WITHDRAW: Your have the right to withdraw from the study at anytime without consequence.

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Or, Dr. Peter Giacobbi, Assistant Professor of Sport Psychology, Department of Exercise and Sport Sciences, 100 Florida Gym, PO Box 118207, Gainesville, FL 32611-8205, phone: 392-0584, ext 324; fax: 392-5262; e-mail: Pgiacobbi@hhp.ufl.edu

WHOM TO CONTACT ABOUT YOUR CHILD’S RIGHTS AS A RESEARCH PARTICIPANT IN THE STUDY: UF IRB Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; phone: (352) 392-0433

AGREEMENT:
I have read the procedure described above and agree to voluntarily participate in the procedure and I have received a copy of this description.

Participant: ________________________    Date: ____________
**Adolescent Anger Rating Scale**

Circle the number that best tells about you when you become angry.

Likert Scale Options: 1 = hardly ever
2 = sometimes
3 = often
4 = very often

*When I am angry, I...

Act without thinking.
Have a hot temper.
Talk loudly.
Have difficulty controlling my temper.
Just can't sit still.
Can't focus on anything else.
Get into trouble because of my temper.
Talk too much.

Hit right back if someone hits me.
Try to work the problem out without fighting.
Try to understand the feelings of others.
Have self-control to walk away to avoid a fight.
Do not plan to use a weapon to hurt someone.
Think about how to make peace with the person who upset me.
Plan how to talk nicely to avoid arguing.
Can ignore it when put down by others.
Have enough self-control not to hit back.
Ignore it when called bad names.
Avoid people to stay out of trouble.
Walk away to avoid fighting.
Still make good choices.
**Demographic Questionnaire**

Age:______                Gender:_____________             Grade:_______

Race/ethnicity (Please circle all that apply): African-American        Caucasian
     Hispanic                   Asian                Pacific Islander
     Other:_____________________________________

Current rankings:   Florida:______      Age division:_______
       National:_____      Age division:_______
       International Tennis Federation (ITF):_________

How many years have you been playing tennis competitively? ____________

How many tournaments have you competed in the last year?___________

**Anger Appraisal**

Please describe a situation or incident that occurred during a match situation (during practice or actual competition) where you became angry or mad. THIS SHOULD BE A SITUATION THAT OCCURRED IN THE LAST WEEK. Please describe your thoughts and feelings during this event.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

________________________________________________________________________

PLEASE ANSWER THE FOLLOWING QUESTIONS ABOUT THE EVENT YOU DESCRIBED ABOVE:

To what extent did you…

a) view the anger provoking event as negative and or threatening.

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<tr>
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</thead>
<tbody>
<tr>
<td>not at all</td>
<td>little</td>
<td>quite a bit</td>
<td>a lot</td>
<td>very much so</td>
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b) view the anger provoking event as positive and or challenging.

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</table>
c) view the anger provoking event as something that you could change or do something about.

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<td>very much</td>
<td>so</td>
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d) view the anger provoking event as something that needed to be accepted or gotten used to.

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e) view the extent the anger provoking event was something that you needed to know more about before you could act.

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<td>very much</td>
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f) view the anger provoking event was something in which you had to hold yourself back from what you wanted to do.

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<td>very much</td>
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g) view the extent to which the anger provoking event as something manageable by you.

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<td>very much</td>
<td>so</td>
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</table>

h) view the anger provoking event as something that you can regulate.

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</tbody>
</table>

i) view the anger provoking event as something over which you have power.

<table>
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<tr>
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<td>a lot</td>
<td>very much</td>
<td>so</td>
<td></td>
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</tbody>
</table>
Coping Function Questionnaire

**How much** did you use the following responses to deal with the situation described above? Please **circle the corresponding number**, with 1 meaning that you didn't do that at all, 2 meaning you used that a little, 3 indicating that you used that response somewhat, 4 meaning you did that quite a bit and, and 5 meaning you did that very much when you were angry.

1 = not at all  
2 = a little  
3 = somewhat  
4 = quite a bit  
5 = very much

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<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I tried to find a way to change the situation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I stayed in the situation and tried to control my emotions to better deal with the situation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I worked harder to try to change the situation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I tried to change how I thought about the situation so it didn't seem so stressful.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I tried to get out of the situation as soon as I could to reduce the stress.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I used strategies to change the situation in order to deal with the stress.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I tried to view the situation in a way that made it seem less stressful.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I tried to leave or avoid the situation to get away from the problem or reduce the stress.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I did my best to change the situation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I tried to use different strategies that would help me control my emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I looked for ways to solve the problem or change the situation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I tried to get out of the situation to get away from the stress.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I stayed in the situation and tried to change it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. I worked through my emotions in order to feel better.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. I tried to get away from the situation to reduce the stress.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. I tried to find ways to control my emotions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17. I tried to relax so that I could keep my emotions under control.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18. In order to reduce the stress I tried to get myself out of the situation.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
**Number of Anger Outbursts**
Please indicate by placing an X on the line next to the answer that best represents *how often during the last week of practice and competition you openly expressed your anger* on the tennis court. Openly expressing anger includes actions such as loud screaming, loud swearing, racquet throwing, hitting the ground or fence with your racquet.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>2</th>
<th>3</th>
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<th>8</th>
<th>9</th>
<th>10</th>
<th>Greater than 10</th>
</tr>
</thead>
</table>
LIST OF REFERENCES


BIOGRAPHICAL SKETCH

Melinda started her educational path in Germany where she attended high school until her sophomore year. At the beginning of her junior year Melinda came to the United States. She then chose to combine her junior and senior year to be able to graduate a year ahead of her class from Ithaca High School (Ithaca, NY).

Melinda then attended Ithaca College (Ithaca, NY) where she pursued a major in biology (premed) with a minor in applied exercise science. She graduated cum laude. After receiving her Bachelor of Science Melinda decided to pursue a Master of Science in sport and exercise psychology at the University of Florida. While attending UF Melinda also completed her master’s in clinical exercise physiology.

Currently, Melinda is pursuing her PhD at the University of Pittsburgh in exercise physiology and intends to graduate in 2007.